Schuyler Heim Bridge Replacement and SR-47 Expressway Project

Supplemental Draft Environmental Impact Statement/ Recirculated Draft Environmental Impact Report and Section 4(f) Evaluation

Commodore Schuyler Heim Bridge (Br. No. 53-2618) and SR-47 in the Ports of Long Beach and Los Angeles, Los Angeles County, California

07-LA-47-KP 4.4/9.3 (PM 2.7/5.8)
EA: 238500

The environmental review, consultation, and any other action required in accordance with applicable federal laws for this project are being, or have been, carried out by Caltrans under its assumption of responsibility pursuant to 23 U.S.C. 327.

Caltrans

November 2008

Replace the vehicular connection along the north-south corridor between Terminal Island and the mainland with a seismically safe bridge, and provide a high-capacity alternative route to and from Terminal Island to improve safety, traffic movement, and reduce traffic delays

SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT / RECIRCULATED DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE SCHUYLER HEIM BRIDGE REPLACEMENT AND SR-47 EXPRESSWAY PROJECT

Submitted Pursuant to: (State) Division 13, California Public Resources Code
(Federal) 42 USC 4332(2)(C) and 23 U.S.C 327, and 49 U.S.C. 303

STATE OF CALIFORNIA
Department of Transportation

Cooperating Agency: United States Coast Guard

Responsible Agencies: Alameda Corridor Transportation Authority, Port of Los Angeles, Port of Long Beach, City of Los Angeles, City of Long Beach, State Historic Preservation Officer, California Department of Fish and Game, California Transportation Commission, Regional Water Quality Control Board, California Coastal Commission

November 12, 2008
Date of Approval

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Abstract

The purpose of the project is to provide a seismically safe vehicular connection along the north-south corridor between Terminal Island and the mainland, and provide a high-capacity alternative route for traffic between Terminal Island and the mainland. This recirculation focuses on new information provided related to the health risk associated with air toxics.

Please send comments to: Ron Kosinski, Deputy District Director, Caltrans – District 7, Division of Environmental Planning, 100 South Main Street, Los Angeles, CA 90012.

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Summary

This Supplemental Draft Environmental Impact Statement/Recirculated Draft Environmental Report (SDEIS/RDEIR) for the proposed Schuyler Heim Bridge Replacement and SR-47 Expressway project provides new information relevant to the proposed project, information that was not available when the Draft EIS/EIR was circulated for public review and comment in August 2007. The Federal Highway Administration (FWHA) NEPA regulations and CEQA Guidelines specify that the lead agency must recirculate an EIS/EIR when there is significant new information added to the project analysis after public notice of the Draft EIS/EIR.

Caltrans is the Lead Agency for CEQA and the FHWA delegated Lead Agency for NEPA. The Alameda Corridor Transportation Authority (ACTA) is a Responsible Agency. ACTA has determined that additional information is necessary in order to fulfill its obligations as a Responsible Agency under CEQA and has requested that Caltrans recirculate the Draft EIS/EIR with the new information discussed below.

The public hearing for the project was held at Banning's Landing, on September 25, 2007, and was attended by members of the public, Caltrans staff, and consultants. Many of the commenters expressed concerns related to air quality emissions impacts and/or associated health risks. As a result of the comments received, the ACTA Board, as a Responsible Agency under CEQA, directed its staff to conduct a Health Risk Assessment (HRA). In response to this new report, Caltrans arranged for a review and analysis of ACTA's HRA by the University of California Davis (UCD).

It was determined that for this particular project, the results of ACTA's HRA study and the UCD analysis comprise significant new information. Caltrans, as the Lead Agency, made the decision to disclose this new information to the public by preparing and circulating this SDEIS/RDEIR. The CEQA Guidelines (15088.5[c]) allow for the lead agency to recirculate an environmental document that has been modified and address the new information that is the basis for the recirculation. Under FHWA regulation 23 CFR 771.130[a(2)], a draft EIS may be supplemented if there is new information relevant to environmental concerns. This SDEIS/RDEIR only includes sections from Chapter 3.0, the Air Quality (3.13) and Community Resources (3.3.3) sections, and portions of other chapters (Chapter 4.0, CEQA Evaluation; and Chapter 5.0, Cumulative Impacts) that are modified as the result of the new information.

The remaining technical sections of the Draft EIS/EIR are not included, as they have not been modified as the result of ACTA's HRA and the UCD analysis even though they may have been slightly revised or clarified as the result of responding to public comments on the Draft EIS/EIR. The revisions in these sections will be included in the Final EIS/EIR that will be prepared following receipt of comments on the SDEIS/RDEIR. The Final EIS/EIR will include responses to all comments received on the original DEIS/DEIR and on this SDEIS/RDEIR.

Changes to the sections of the Draft EIS/EIR are marked by a vertical line on the right margin. In addition, changes related to the new information are <u>underlined</u>.

The following table summarizes the changes to the air quality and the community resource sections of the Draft EIS/EIR, which are presented in this supplemental/recirculated document.

Section	Change
3.3, Community Resources	Environmental Justice discussion added as a result of the HRA
3.13, Air Quality	Revisions corresponding to public comments, recent regulatory updates; Discussion added as a result of the HRA
4.0, CEQA Evaluation	Discussion added as a result of the HRA
5.0, Cumulative Impacts	Cumulative effects discussion added as a result of the HRA

Project Impacts and Minimization/Mitigation Measures Resulting from the New Information on Health Risks

Project Health Risk Impacts

Project impacts are analyzed in detail in the Draft EIS/EIR, which was circulated for public review in August 2007. Additional potential impacts presented in this SDEIS/RDEIR are based on the information provided in ACTA's HRA and the UCD analysis.

Caltrans' HRA Findings:

Caltrans as the Lead Agency for CEQA and the FHWA delegated Lead Agency for NEPA has made the determination that there are no new significant impacts under NEPA or CEQA as a result of the new health risk information and no new mitigation measures are required. It should be noted that Caltrans has not adopted HRA thresholds of significance and is not subject to local thresholds of significance.

ACTA's HRA Findings:

ACTA, as a Responsible Agency for CEQA, has made the determination that the potential for cancer risk is significant. ACTA's finding is based upon the City of Los Angeles CEQA Thresholds Guide, which incorporates the SCAQMD CEQA Air Quality Handbook thresholds of significance. ACTA will provide the recommended mitigation measure to reduce the risk to the extent possible.

ACTA has made the following findings:

Alternatives 1 and 3: Based on the local significance threshold, ACTA finds that for Alternative 1, or 1A, the project would have a significant impact on a number of residential receptors in the project vicinity. Mitigation measures to reduce the cancer risks were evaluated and it was ACTA's determination that retrofits of heating, ventilating, and air conditioning (HVAC) units would be feasible mitigation measure to reduce the incremental cancer risks. The residential cancer risk impacts after mitigation are expected to be below the SCAQMD significance threshold on 10 in one million. Alternative 1, or 1A, would not cause significant acute or chronic risk impacts to receptors in the project area.

Alternative 2: Based on the local significance threshold, Alternative 2 would have a significant impact on a number of residential receptors as well as school workers and recreational users in the project vicinity. Mitigation measures to reduce the cancer risks were evaluated and it was determined that retrofits of HVAC units would be a feasible mitigation measure to reduce the incremental cancer risks for residential and school worker receptors. However, since recreational user exposure occurs outdoors at Hudson Park, the HVAC retrofits would not be an effective approach. Therefore, the cancer risk for recreational users at Hudson Park would remain significant.

ACTA's Proposed Mitigation Measure for Health Risk Impact

AQ-13 Retrofits of heating, ventilating and air conditioning (HVAC) units. New heating, ventilating, and air conditioning (HVAC) units, or retrofit of existing HVAC units, will be installed in residences within the vicinity of the significant impact zone.

This measure will be incorporated into the Final EIS/EIR Environmental Commitment Record and will be fulfilled by ACTA.

1.0 Introduction

This Supplemental Draft Environmental Impact Statement/Recirculated Draft Environmental Impact Report (SDEIS/RDEIR) for the proposed Schuyler Heim Bridge Replacement and SR-47 Expressway project provides new information relevant to the proposed project, information that was not available when the Draft EIS/EIR was circulated for public review and comment in August 2007. This document is considered a partial SDEIS/RDEIR because it only includes information and analysis updated since the Draft EIS/EIR was circulated. The new information is based on the Alameda Corridor Transportation Authority's (ACTA) decision to prepare a Health Risk Assessment (HRA) and an analysis of the ACTA HRA performed by the University of California Davis (UCD) at Caltrans' request.

1.1 Public Review of Draft EIS/EIR

Public review of the Draft EIS/EIR began on August 17, 2007, and ended on October 16, 2007. In response to public input, Caltrans distributed a letter, dated October 15, 2007, which extended the comment period beyond the original 60 days, until early November 2007, for those who requested an extension.

Additionally, informal comments and responses were handled by telephone and written documentation between Caltrans, ACTA, and members of the public during the extended comment period.

1.2 Public Hearing

The public hearing for the project was held at Banning's Landing, on September 25, 2007, and was attended by members of the public, Caltrans staff, and consultants. Attendance at the public hearing was 62 people having signed in. A map viewing area provided the persons in attendance with the opportunity to view the project alternatives and to speak with Caltrans staff and project consultants. In addition, models of the proposed designs for a new fixed-span bridge were on display.

The public hearing included a presentation by Caltrans, followed by the public comment period, an open forum where more than 20 individuals provided oral comments on the Draft EIS/EIR. For those in attendance who required Spanish or Pilipino interpretation, both Spanish and Tagalog (Pilipino dialect) translators were present for simultaneous translation of the proceedings.

1.3 Comments Received

Comments provided by members of the public at the public hearing were recorded in the public hearing transcript and will be included in the Final EIS/EIR. In addition, the public provided comments in letters to Caltrans, the Lead Agency. These letters and responses will

also be included in the Final EIS/EIR. Of the approximately 500 comments received, about 115 (20 percent) expressed concerns related to air quality emissions impacts and/or associated health risks and associated environmental justice issues. Many commenters asked for a Health Risk Assessment to be included in the EIS/EIR.

1.4 Decision to Recirculate the EIS/EIR

As a result of the comments received on air quality and potential health risk, the ACTA Board, as a Responsible Agency under CEQA, directed its staff to conduct an HRA. An air quality consultant prepared an HRA and submitted it to Caltrans for review and consideration. Caltrans obtained a review and analysis of the HRA by UCD. The draft HRA was reviewed by members of the UCD-Caltrans Air Quality Project, UCD Department of Civil and Environmental Engineering, and the UCD Department of Health Science. UCD reviewed the approaches and assumptions used in the emission estimation and modeling of the HRA, and identified some questions and issues in the draft HRA report. The UCD concerns are set forth in "Brief Screening-Level Review of the Draft Health Risk Assessment (HRA) for the Schuyler-Heim Bridge Replacement and SR-47 Expressway Project (Heim Bridge)" which is Appendix B to this SDEIS/RDEIR.

The CEQA Guidelines (15088.5[a]) specify that the lead agency must recirculate an EIR when there is significant new information added to the project analysis after public review of the Draft EIR. The results of ACTA's HRA and the UCD analysis were determined to be new information potentially having a significant environmental impact and thus requiring recirculation under CEQA Guidelines 15088.5(a). CEQ regulations, 40 CFR 1502.9(c) allows agencies to prepare supplements to either draft or final environmental impact statements if:

> (i) The agency makes substantial changes in the proposed action that are relevant to environmental concerns; or
>
> (ii) There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.

As stated above, it was determined that for this particular project, the results of ACTA's HRA study and the UCD analysis comprise significant new information. Caltrans is disclosing this new information to the public by preparing and circulating this SDEIS/RDEIR.

The CEQA Guidelines (15088.5[c]) allow for the lead agency to recirculate an environmental document that has been modified and address the new information that is the basis for the recirculation. Under Federal Highway Administration (FHWA) regulation 23 CFR 771.130a(2)], a draft EIS may be supplemented if there is new information relevant to environmental concerns. Therefore, this SDEIS/RDEIR only includes sections from Chapter 3.0, the Air Quality (3.13) and Community Resources (3.3.3) sections, and portions of other chapters that are modified as the result of the new information.

1.4.1 Federal Rationale for Inclusion of Health Risk Information

The FHWA Interim Guidance for Mobile Source Air Toxics (MSAT) Analysis indicates that available technical tools do not reliably predict the project-specific health impacts of the

MSAT emission changes associated with project alternatives. Limitations of the tools include the following:

- **Emissions.** The tools available from EPA and the California Air Resources Board to estimate MSAT emissions from motor vehicles are not sensitive to key variables that determine emissions of MSATs in the context of highway projects.
- **Dispersion.** The tools to predict how MSATs disperse are also limited. The current EPA and California line-source regulatory models, such as CALINE3, CAL3QHC, and CALINE4, were developed and validated for the purpose of predicting episodic concentrations of carbon monoxide to determine compliance with the NAAQS. The performance of these dispersion models is adequate for predicting maximum concentrations that can occur over short time periods. Alternative dispersion models, like EPA's AERMOD, were not developed for use with line sources, requiring adaptation and approximation of line emission sources like roads. Along with these general limitations of dispersion models, FHWA is also faced with a lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.
- **Exposure Levels and Health Effects.** Even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude the analysis from reaching meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. A worst-case analysis approach does not mitigate these concerns because it replaces uncertainty with assumptions that lead to risk estimates that almost certainly are far in excess of anything realistic.

Despite these limitations, ACTA, a Responsible Agency under CEQA, directed the preparation of an HRA for the project in response to comments on the DEIS/DEIR regarding potential health risk related to MSATS. Once the ACTA HRA was prepared, Caltrans, the Lead Agency under NEPA as assigned by FHWA, determined that this HRA constituted additional information that was potentially useful to the public and decision-makers and therefore should be made available under NEPA.

1.4.2 State Rationale for Inclusion of Health Risk Information

Caltrans has conducted its own internal review of the ACTA HRA and requested review of the HRA by the University of California, Davis (UCD), Department of Civil and Environmental Engineering. Caltrans, in consultation with UCD, has concerns about the assumptions, methodology, and findings of the HRA. The UCD concerns are set forth in the September 8, 2008 UCD Memo which is Appendix B to this SDEIS/RDEIR. While Caltrans believes that current HRA methodologies have clear limitations and uncertainties, in highly unusual circumstances such as those presented by this project, such studies may be useful for the comparison of project alternatives. The unusual conditions of this project contributed to this decision. These unusual conditions include very large numbers of diesel trucks in the project area, substantial proportions of both minority and low-income persons, and adjacent sensitive land uses including schools and residential neighborhoods.

1.4.3 Local Rationale for Inclusion of Health Risk Information

ACTA, a joint powers authority formed by the cities and ports of Los Angeles and Long Beach, is a Responsible Agency under CEQA for the project and will be providing significant funding for and constructing the expressway portion of the project. ACTA has elected to conduct a quantitative health risk analysis in response to community concerns raised during the circulation period about potential health impacts from the expressway portion of the proposed project. ACTA also has indicated willingness to implement mitigation measures to reduce the estimated risk in excess of the SCAQMD significance threshold of 10 in one million to less than the SCAQMD significance threshold. ACTA's reasons for conducting such an analysis and mitigating impacts are as follows:

1. Comments on the Draft EIS/EIR requested that air toxics associated with increased truck traffic be addressed. There are local protocols currently in use for performing health risk assessments and established SCAQMD thresholds for evaluating the significance of estimated health risks. Such protocols and significance levels have been used by the individual members of the ACTA joint powers authority in the preparation of EIRs for projects within their jurisdictions.
2. ACTA is a Responsible Agency under CEQA and will be implementing the expressway portion of this project. This work will require development permits from the Port of Long Beach and Port of Los Angeles. CEQA documents prepared in support of recent port development permits have all included quantitative health risk assessments.

1.5 Public Review and Comments on this Document

The public is provided with a 45-day review period of the SDEIS/RDEIR, beginning the day the Notice of Availability is published in the Federal Register. Reviewers are requested to limit their comments to only information that is provided in this SDEIS/RDEIR. Comments that are received on information provided in this SDEIS/RDEIR will be responded to, and these responses will be provided in the Final EIS/EIR for the Schuyler Heim Bridge Replacement and SR-47 Expressway Project along with the responses to comments on the original Draft EIS/EIR.

The public is requested to send comments to:

Ronald J. Kosinski, Deputy District Director
Division of Environmental Planning
Department of Transportation, District 7
100 South Main Street MS-16A
Los Angeles, CA 90012

The public hearing for the project was held at Banning's Landing, on September 25, 2007. An additional public hearing for this SDEIS/RDEIR is not required and is not planned at this time.

2.0 Project Purpose and Need

2.1 Project Purpose and Need

The following is a brief description of project purpose and need to assist the reader in reviewing this document. It is not intended to replace the Project Purpose and Need discussion provided in the Draft EIS/EIR. For a full discussion of the Project Purpose and Need, please refer to Chapter 1.0 of the Draft EIS/EIR.

The purpose of the Project is to provide a structurally and seismically safe vehicular connection along the critical north-south corridor between Terminal Island and the mainland that can remain in service following a major earthquake to ensure that ground and vessel transportation are maintained and to provide a high-capacity alternative route for traffic between Terminal Island and I-405.

Overall, there is a need for the project because of the following deficiencies:

Schuyler Heim Bridge:

- Seismically and structurally deficient and functionally obsolete
- Substandard safety design standards. Lane widths, bridge rails, and shoulder widths do not meet Caltrans standards
- Delays to movement of people, freight, and goods caused by raising the bridge to allow marine traffic to pass underneath
- Safety issues related to traffic congestion caused by raising the bridge to allow marine traffic to pass underneath
- Bridge is near the end of its useful and functional life cycle.

Transportation routes in the project area:

- Shortage of north-south freeway capacity
- Congestion on local surface streets
- Potential for incidents related to cross-traffic at intersections and railroad crossings.

2.2 Project Description

The following is a brief discussion of the Project Description to assist the reader in reviewing this document. It is not intended to replace the Project Description provided in the Draft EIS/EIR. For a full discussion of the Project Description refer to Chapter 2.0 of the Draft EIS/EIR.

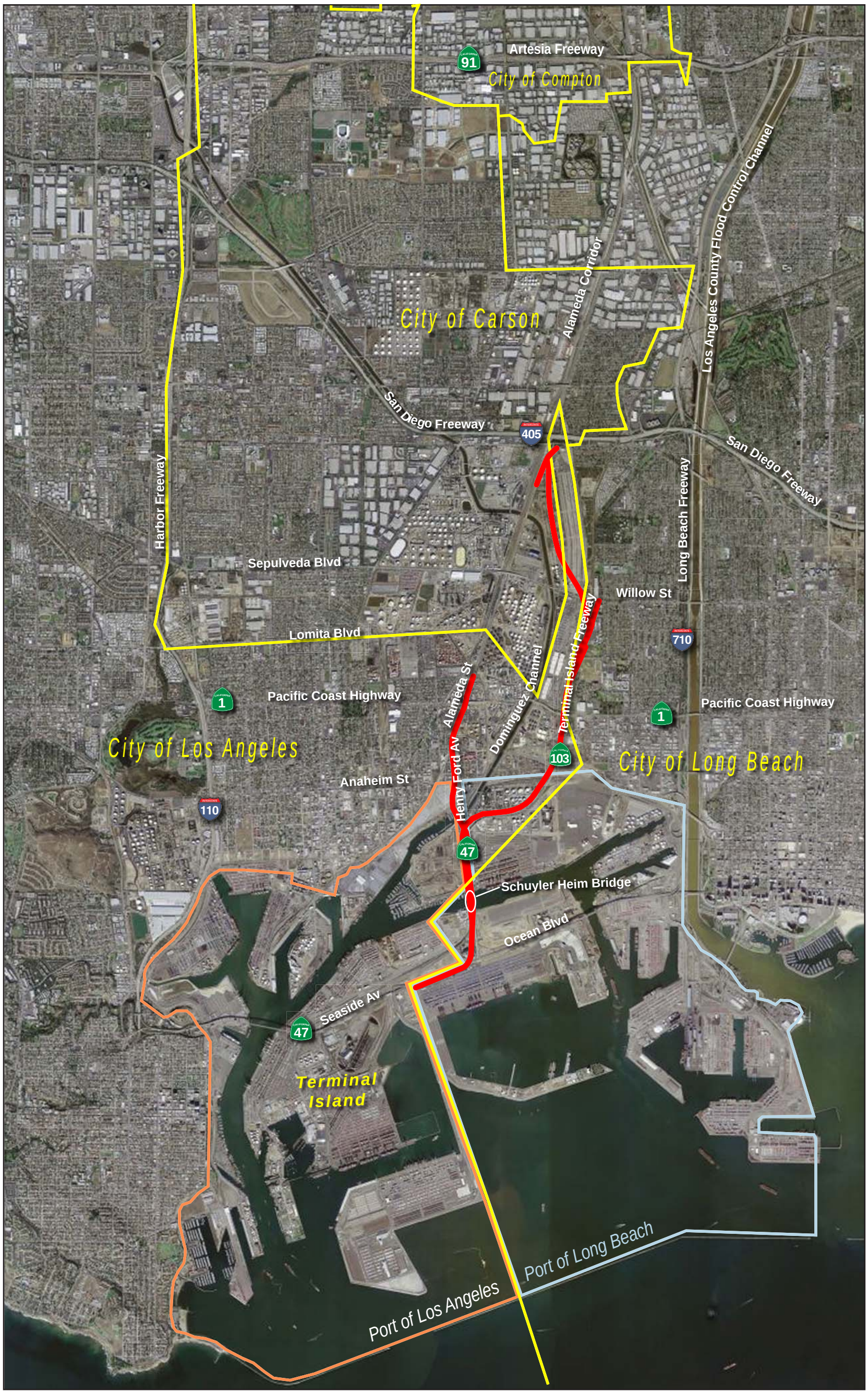
The proposed project would occur within the Ports of Long Beach and Los Angeles and the Cities of Long Beach and Los Angeles. The project area generally lies between Terminal Island on the south and SR-91 (Artesia Freeway) on the north, and between I-710 (Long Beach Freeway) on the east and I-110 (Harbor Freeway) on the west. This area includes the Port of Long Beach, Port of Los Angeles, Wilmington District of the City of Los Angeles, southern part of the City of Carson, and western portion of the City of Long Beach. The southern portion of the project area consists primarily of industrial uses associated with the ports. To the north, the area is a mix of industrial, residential, and commercial uses. The project area is shown in Figure 1.

The project consists of six alternatives to address the seismically deficient status of the Schuyler Heim Bridge, as well as traffic congestion in the Ports area. The proposed alternatives include replacement of the Schuyler Heim lift bridge with a fixed-span bridge and either construction of an elevated SR-47 Expressway from Terminal Island to Pacific Coast Highway (the new bridge will be a portion of the new expressway) or construction of an elevated SR-103 Extension. These six alternatives are summarized below:

- Alternative 1/1A (Bridge Replacement and SR-47 Expressway): this alternative would involve the replacement of the existing Schuyler Heim lift bridge with a fixed span bridge and construction of a 4-lane elevated roadway from the Bridge, along Henry Ford Ave., to Alameda corridor at Pacific coast Highway.
- Alternative 2 (SR-103 Extension to Alameda Street): this alternative would involve the replacement of the existing Schuyler Heim lift bridge with a fixed span bridge as in Alt. 1 and construction of a 4-lane elevated roadway extension of the SR-103 to Alameda in the vicinity of the intersection with 223rd Street.
- Alternative 3 (Bridge Demolition Avoidance): this alternative involves construction of a new fixed span bridge next to the existing one, and keeping the existing bridge standing but unused for transportation purposes. This alternative also involves retrofitting the old bridge to keep it standing and construction of a 4-lane elevated roadway from the Bridge, along Henry Ford Ave., to Alameda corridor at Pacific Coast Highway.
- Alternative 4 (Bridge Replacement Only): this alternative involves only the replacement of the old bridge as in Alt. 1. No roadway construction is included.
- Alternative 5 (Transportation System Management): This alternative involves minor modifications of the existing roadway, traffic signals and Intelligent Transportation Systems (ITS) applications. There would be no change with the old bridge and no new roadway construction involved.
- Alternative 6: No Build

Alternatives 1 through 4 are considered the "build" alternatives (Figure 2).

Caltrans will fund the bridge portion of the project and ACTA will fund the expressway portion. Caltrans is the Lead Agency for the project under NEPA and CEQA.



LEGEND:

- City Boundary
- Proposed Project Alignment
- Port of Los Angeles Boundary
- Port of Long Beach Boundary

No Scale

Source: U.S.G.S. Aerial Map Service, Los Angeles Harbor Department, 2004

Figure 1
Study Area
Schuyler Heim Bridge Replacement and SR-47 Expressway

LEGEND

- Alternative 1: Bridge Replacement and SR-47 Expressway
- Alternative 2: SR-103 Extension
- Alternative 3: Bridge Demolition Avoidance
- Alternative 4: Bridge Replacement Only
- Wardlow Road/223rd Street Ramp
- Ocean Boulevard/SR-47 Flyover
- Existing SR-103

0 2,800 Feet

0 1,000 Meters

Figure 2
Build Alternatives
Schuyler Heim Bridge Replacement and SR-47 Expressway

Aerial Date: May 2002

Note: Project components not to scale

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3.0 Environmental Setting, Consequences and Avoidance, Minimization and Mitigation Measures

The following is the revised Section 3.13, Air Quality, from the Draft EIS/EIR. This Section 3.13, Air Quality, (as amended) is intended to replace Section 3.13, Air Quality, from the Draft EIS/EIR.

The information contained in this section is based upon the *Human Health Risk Assessment for the Schuyler Heim Bridge Replacement and SR-47 Expressway Project* (ACTA, 2008); the UCD analysis of that assessment, which are respectively included in this document as Appendices A and B; and an updated assessment of mobile source air toxics.

3.13 Air Quality

This chapter evaluates the potential air quality effects of the proposed action. The information contained in this section is based upon the *Schuyler Heim Bridge Replacement and SR-47 Expressway Project Air Quality Impacts Technical Study* which is hereby incorporated by reference in its entirety (Caltrans, 2008).

3.13.1 Regulatory Setting

3.13.1.1 Federal Requirements

Federal air quality policies are regulated through the federal Clean Air Act (CAA). The United States Environmental Protection Agency (EPA) adopted the CAA in 1970 and its amendments in 1977 and 1990. Pursuant to the CAA, EPA has established nationwide air quality standards to protect public health and welfare with an adequate margin of safety. These federal standards, known as the national ambient air quality standards (NAAQS), represent the maximum allowable atmospheric concentrations and were developed for seven "criteria" pollutants: ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), particulate matter less than 10 microns in aerodynamic diameter, (PM_{10}) and $PM_{2.5}$, sulfur dioxide (SO_2), and lead (Pb). The State of California has also established maximum allowable concentrations for these pollutants. The federal (and California) ambient air quality standards are summarized in Table 3.13-1 and represent safe levels of each pollutant to avoid specific adverse effects to human health and the environment.

Table 3.13-1
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	Federal Standards[b]	
			Primary[c]	Secondary[d]
O_3	8 Hours	0.070 ppm	0.075 ppm	Same as Primary
	1 Hour	0.09 ppm	— [e]	— [e]
CO	8 Hours	9.0 ppm	9 ppm	—
	1 Hour	20 ppm	35 ppm	—
NO_2	Annual Average	0.03 ppm [h]	0.053 ppm	0.053 ppm
	1 Hour	0.18 ppm [h]	—	—
$S0_2$	Annual Average	—	0.030 ppm	—
	24 Hours	0.04 ppm	0.14 ppm	—
	3 Hours	—	—	0.5 ppm
	1 Hour	0.25 ppm	—	—
$PM_{2.5}$	Annual Geometric Mean	12 µg/m^3	15 µg/m^3	15 µg/m^3
	24 Hours	—	35 µg/m^3 [f]	35 µg/m^3
PM_{10}	Annual Arithmetic Mean	20 µg/m^3	—[f]	—
	24 Hours	50 µg/m^3	150 µg/m^3	150 µg/m^3
Lead	30-Day Average	1.5 µg/m^3	—	—
	Calendar Quarter	—	.15 µg/m^3	Same as Primary
Sulfates	24 Hours	25 µg/m^3	—	—

Table 3.13-1
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	Federal Standards[b]	
			Primary[c]	Secondary[d]
Hydrogen Sulfide	1 Hour	0.03 ppm	—	—
Vinyl Chloride	24 Hours	0.010 ppm	—	—
Visibility-Reducing Particles	8 Hours (10 AM to 6 PM, PST)	See Note [g]	—	—

Notes:

[a] California standards for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, PM_{10}, $PM_{2.5}$, and visibility-reducing particles are values that are not to be exceeded. The standards for sulfates, lead, hydrogen sulfide, and vinyl chloride are not to be equaled or exceeded.

[b] National standards, other than ozone and those based on annual averages or annual arithmetic means, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than 1.

[c] National Primary Standards represent the levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[d] National Secondary Standards represent the levels of air quality necessary to protect the environment, including public welfare, from any known or anticipated adverse effects of a pollutant.

[e] On June 15, 2005, the 1-hour ozone standard of 0.12 parts per million (ppm) was revoked for all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) areas. (Those areas do not yet have an effective date for their 8-hour designations.)

[f] On September 21, 2006, the EPA promulgated a new 24-hour $PM_{2.5}$ standard and revoked the annual PM_{10} standard. These changes were effective December 17, 2006. To attain the new $PM_{2.5}$ standard, the 3-year average of the 98th percentile 24-hour concentration at each population-oriented monitor within an area must not exceed 35 $\mu g/m^3$.

[g] A sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.

[h] The California air quality standards for NO_2 were amended on February 22, 2007, to lower the 1-hour standard to 0.18 ppm and establish a new annual standard of 0.03 ppm. These changes became effective on March 20, 2008.

ppm parts per million by volume
PST Pacific Standard Time
$\mu g/m^3$ micrograms per cubic meter
Source: ARB, 2007 (http://www.arb.ca.gov/aqs/aqs.htm), updated 02/22/2007

The 1977 CAA amendment required each state to develop and maintain a State Implementation Plan (SIP) for each criteria pollutant that violates the applicable NAAQS. The SIP serves as a tool to avoid and minimize emissions of pollutants that exceed ambient threshold criteria and to achieve compliance with the NAAQS. In 1990, the CAA was amended to strengthen regulation of both stationary and mobile emission sources for criteria pollutants. Conformity to the SIP is defined under the 1990 CAA amendments as conformity with the plan's purpose in eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of these standards.

3.13.1.1.1 Transportation Conformity

Transportation conformity is an analytical process required for all federally funded transportation projects in California. The Southern California Association of Governments (SCAG) is the federally designated Metropolitan Planning Organization (MPO) responsible for transportation planning in the South Coast Air Basin (Basin). Air quality provisions in the CAA, transportation planning provisions of United States Code (USC) Title 23 and Title 49 and Code of Federal Regulations (CFR) Title 40 Parts 51 and 93 are intended to

ensure that integrated transportation and air quality planning occurs in areas such as Los Angeles County, which are designated by EPA as nonattainment or maintenance areas for ambient levels of CO, O_3, PM_{10}, and $PM_{2.5}$. The transportation conformity process establishes the major connection between transportation planning and emission reductions from transportation sources. In addition, the Intermodal Surface Transportation Efficiency Act of 1991 (revised in 1998 as TEA-21) linked compliance with conformity requirements to continued Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) funding of transportation plans, programs, and projects. These requirements were not changed with enactment of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) on August 10, 2005. The revised planning requirements set forth in SAFETEA-LU require SCAG to develop, update, and maintain the RTP on a 4-year cycle.

Under the 1990 CAA Amendments, the U.S. Department of Transportation cannot fund, authorize, or approve federal actions to support programs or projects that are not first found to conform to the SIP for achieving the goals of the CAA requirements. Conformity with the CAA takes place on two levels—first, at the regional level and second, at the project level. The proposed project must conform at both levels to be approved. A brief outline of the regional and project-level conformity process follows.

3.13.1.1.1.1 Regional Conformity Determination

Regional level conformity in California is concerned with how well the region is meeting the standards set for CO, NO_2, O_3, and PM. The South Coast Air Basin (SCAB) is currently designated as nonattainment for O_3, PM_{10}, and $PM_{2.5}$, and was recently re-designated as an attainment/maintenance area for CO (June 2007). The SCAB is in attainment for the other criteria pollutants. At the regional level, Regional Transportation Plans (RTP) are developed that include all of the transportation projects planned for a region over a period of years, usually at least 20. Based on the projects included in the RTP, an air quality model is run to determine whether or not the implementation of those projects would conform to emission budgets or other tests showing that attainment requirements of the CAA are met. If the conformity analysis is successful, the regional planning organization, SCAG, and the appropriate federal agencies, such as the FHWA, make the determination that the RTP is in conformity with the SIP for achieving the goals of the CAA. Otherwise, the projects in the RTP must be modified until conformity is attained. If the design and scope of the proposed transportation project are the same as described in the RTP, then the proposed project is deemed to meet regional conformity requirements for purposes of project-level analysis.

3.13.1.1.1.2 Project-Level Conformity

In addition to regional conformity, a project-level conformity determination is also required in CO, PM_{10}, and $PM_{2.5}$ nonattainment and maintenance areas. The following criteria are required to demonstrate project-level conformity:

- The project is listed in a conforming RTP and Regional Transportation Improvement Program (RTIP).
- The design concept and scope that were in place at the time of the conformity finding are maintained through implementation.
- The project design concept and scope must be defined sufficiently to determine emissions at the time of the conformity determination.

- The project must not cause a new local violation of the federal standards for CO, PM_{10}, or $PM_{2.5}$ or exacerbate an existing violation of the federal standards for CO, PM_{10}, or $PM_{2.5}$.

Project-level conformity for the final criteria listed above is demonstrated by performing "hot spot" analyses in areas designated as "nonattainment" or "maintenance" areas for CO, PM_{10}, and $PM_{2.5}$. A region is a nonattainment area if one or more monitoring stations in the region fail to attain the relevant standard. Areas that were previously designated as nonattainment areas but have recently met the standard are called maintenance areas. Further discussion of attainment status is provided in Section 3.13.2.3.

3.13.1.1.1.3 Applicability of Transportation Conformity to the Proposed Action

The proposed action of Schuyler Heim Bridge replacement and the expressway is subject to transportation conformity requirement, as well as National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) evaluation.

3.13.1.1.2 Mobile Source Air Toxics (MSAT)

The CAA identified 188 air toxics, also known as hazardous air pollutants. EPA has assessed this expansive list of toxics and identified a group of 21 as mobile source air toxics (MSATs), which are set forth in an EPA final rule, Control of Emissions of Hazardous Air Pollutants from Mobile Sources (66 FR 17235). EPA also extracted a subset of this list of 21 that it now labels as the six priority MSATs. These MSATs are benzene, formaldehyde, acetaldehyde, diesel particulate matter (DPM)/diesel exhaust organic gases, acrolein, and 1,3-butadiene. FHWA has developed an interim guidance on how to analyze MSATs in the NEPA process for highways. The entire MSAT analysis is presented in an Appendix to the Final Schuyler Heim Bridge Replacement and SR-47 Expressway Project Air Quality Impacts Technical Study (Caltrans, 2008).

3.13.1.2 State Requirements

The California Air Resources Board (ARB) oversees California air quality policies. California ambient air quality standards (CAAQS), shown in Table 3.13-1, were established in 1969 pursuant to the Mulford-Carrell Act. These standards are generally more stringent than the NAAQS and include four additional pollutants: sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particulates. The California CAA, which was approved in 1988, requires each local air district in the state to prepare an Air Quality Management Plan (AQMP) that complies with the CAAQS.

Recently, California has also enacted regulations for emissions of greenhouse gases (GHGs), which contribute to climate change. While climate change has been a concern since at least 1988, as evidenced by the establishment of the United Nations and World Meteorological Organization's Intergovernmental Panel on Climate Change (IPCC), the efforts devoted to GHG emissions reduction and climate change research and policy have increased dramatically in recent years. In 2002, with the passage of Assembly Bill 1493 (AB 1493), California launched an innovative and pro-active approach to dealing with GHG emissions and climate change at the state level. AB 1493 requires the ARB to develop and implement regulations to reduce automobile and light truck GHG emissions; these regulations will apply to automobiles and light trucks beginning with the 2009 model year.

In addition, on June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. The goal of this Executive Order is to reduce California's GHG emissions to: (1) 2000 levels by 2010; (2) 1990 levels by the 2020; and (3) 80 percent below the 1990 levels by the year 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006. AB 32 sets the same overall GHG emissions reduction goals while further mandating that ARB create a plan, which includes market mechanisms, and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the state's Climate Action Team.

With Executive Order S-01-07, Governor Schwarzenegger set forth the low carbon fuel standard for California. Under this executive order, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by 2020.

Climate change and GHG reduction is also a concern at the federal level; however, at this time, no legislation or regulations have been enacted specifically addressing GHG emissions reductions and climate change. However, California, in conjunction with several environmental organizations and several other states, sued to force EPA to regulate GHGs as a pollutant under the Clean Air Act (*Massachusetts vs. Environmental Protection Agency et al.*, U.S. Supreme Court No. 05–1120. 549 U.S. Argued November 29, 2006—Decided April 2, 2007). The court ruled that GHGs do fit within the Clean Air Act's definition of a pollutant, and that EPA does have the authority to regulate GHGS. Despite the Supreme Court ruling, there are no promulgated federal regulations to date limiting greenhouse gas emissions.

3.13.1.3 Regional and Local Requirements

The South Coast Air Quality Management District (SCAQMD) is the local agency responsible for ensuring that federal and state ambient air quality standards are attained and maintained in the Greater Los Angeles area, which includes all or portions of Los Angeles, Orange, Riverside, and San Bernardino counties. SCAG is the federally designated MPO responsible for transportation planning. As such, SCAG is required to ensure that all transportation plans, programs, and projects conform to the state and federal Clean Air Acts. The SCAQMDAQMP/SIP outlines policies and mitigation measures to achieve federal and state standards for healthful air quality in the South Coast Air Basin (Basin). The most recent EPA-approved South Coast SIPs are the 1997 Air Quality Management Plan (SCAQMD, 1997) and the *1999 Amendment to the 1997 Ozone AQMP Revision for the South Coast Air Basin and Settlement Agreement on the 1994 Ozone SIP Litigation* (SCAQMD, 1999).

The 2003 AQMP/SIP was approved by the SCAQMD Board of Directors and ARB in 2003 (SCAQMD, 2003). The 2003 AQMP was submitted to EPA for approval on January 9, 2004. On March 25, 2004, EPA found the South Coast SIP budgets in the 2003 AQMP for transportation projects to be adequate (Federal Register [FR] Vol. 69, No. 58, 15325). The most recent AQMP, the 2007 Final AQMP/SIP, was adopted by the AQMD Board on June 1, 2007. On July 13, 2007, the AQMD Board adopted the 2007 Final AQMP Transportation Conformity Budgets and directed the Executive Officer to forward the adopted 2007 AQMP Transportation Conformity Budgets to the ARB for its approval and subsequent submittal to the EPA (SCAQMD, 2007). On September 27, 2007, the ARB Board adopted the State Strategy for the 2007 SIP and the 2007 SCAQMD Plan as part of the SIP. The final 2007 AQMP, along with the transportation conformity budgets of SCAB, were submitted to EPA

for approval on November 28, 2007. In May 2008, EPA made the adequacy determination on the 8-hour ozone budgets in the 2007 AQMP (73 FR 28110, May 15, 2008; as corrected on 73 FR 34837, June 18, 2008).

SCAQMD Rule 403 (Fugitive Dust) requires specific actions or measures to prevent, reduce, or mitigate particulate matter emissions generated from man-made fugitive dust sources. Required actions for each fugitive dust source within the active operation are listed in Rule 403 Table 1, Best Available Control Measures. Additional requirements for large operations with 50 acres or more of disturbed surface area, or with a daily earth-moving or throughput volume of 5,000 cubic yards are listed in Rule 403 Tables 2 and 3. However, the requirements for larger operations do not apply to this project.

SCAQMD Rule 1166 (Volatile Organic Compound Emissions from Decontamination of Soil) limits the emissions of volatile organic compounds (VOCs) from soil contaminated with VOC as a result of leakage from storage or transfer facilities, accidental spillage, or other deposition. Rule 1166 will apply during the construction phase of the proposed project and is addressed below in Section 3.13.3.5.1.1.

In addition, the City of Los Angeles has adopted its L.A. CEQA Thresholds Guide (City of Los Angeles 2006) that references the SCAQMD CEQA Air Quality Handbook (SCAQMD http://www.aqmd.gov/ceqa/handbook/signthres.pdf, accessed August 2008) to evaluate whether a project would cause any significant exposure of air toxics in project vicinity. Discussions of the health risk analysis of the project are included in Sections 3.13.3.4.3 and 3.13.3.6.

3.13.2 Affected Environment

3.13.2.1 Climate

The project site is located in the western-most portion of the Basin in Los Angeles County. The Basin experiences a mild and fairly dry climate, with mean average temperatures ranging from approximately 55 degrees Fahrenheit (°F) in the winter to approximately 83°F in the summer. Average wind speeds in the Basin are light and primarily from the west. The normal daily wind pattern is characterized by a daytime sea breeze and a weak nighttime land breeze. Region-wide elevated temperature inversions are common and can occur at any time of the year. The usually mild climatological pattern of the area is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds. Elevated terrain to the north and east of the Basin, combined with temperature inversions and low wind speeds, often result in poor air circulation of the area and, consequently, poor air quality.

3.13.2.2 Ambient Air Quality

3.13.2.2.1 Criteria Pollutants

A network of ambient air quality monitoring stations located throughout the Basin characterize the air quality environment in the Basin. The North Long Beach monitoring station is located closest to the project area (approximately 5 miles northeast) and provides ambient air quality data representative of local conditions. The North Long Beach station monitors CO, O_3, SO_2, NO_2, PM_{10}, and $PM_{2.5}$. These six pollutants are called "criteria" pollutants. Federal and state standards that have been established represent the maximum allowable atmospheric concentrations of these pollutants. The state and federal ambient air quality standards are listed in Table 3.13-1. The following provides a summary of the criteria

pollutant monitoring data for the time period 2001 through 2006, a description of mobile source air toxics, and a description of greenhouse gases.

Ambient air quality data from the North Long Beach monitoring station for the years 2001 through 2006 are summarized in Table 3.13-2, which lists maximum pollutant levels measured and the number of days each year the ambient concentrations were above federal and state standards. This discussion focuses on the three most recent years of the monitoring data (2004-2006). The state and federal CO, NO_2, and SO_2 standards for the years 2004 to 2006, inclusive, were not exceeded at the North Long Beach station. In the past 3 years, there were no violations of the federal 8-hour O_3 standard or the California 1-hour O_3 standard. The state annual arithmetic mean standard for PM_{10} has been exceeded in all 3 years, and a total of 13 days exceeded the state 24-hour PM_{10} standards. However, there have been no recorded exceedances of the federal 24-hour PM_{10} standard in the past 3 years. The current federal 24-hour $PM_{2.5}$ standard was exceeded each year in the past 3 years. The current federal 24-hour $PM_{2.5}$ standard became effective December 2006, so the number of exceedances reported in Table 3.13-2 reflects exceedances of the old standard. The state standard for the annual average $PM_{2.5}$ concentration was exceeded in each of the past 3 years, while the federal standard for the annual average $PM_{2.5}$ concentration for the same time period was exceeded in 2 of the 3 years.

PM_{10} monitoring data are available from other stations near the project site. SCAQMD operates three monitoring stations in the Long Beach and Wilmington area at Hudson School, Edison Elementary School, and the Wilmington Childcare Center for the Rule 1158 study (SCAQMD, 2004). The monitoring data indicated that the PM_{10} concentrations at Hudson School site were higher than the other stations. The monitoring data also indicated that the PM_{10} concentrations were decreasing over the past years at all three stations.

3.13.2.2.2 Mobile Source Air Toxics

In addition to the criteria pollutants, mobile source air toxics comprise another group of pollutants of concern in the South Coast Air Basin. The six priority MSATs are benzene, formaldehyde, acetaldehyde, DPM/diesel exhaust organic gases, acrolein, and 1,3-butadiene. The EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The EPA Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The following toxicity information for the six prioritized MSATs was taken from the IRIS database Weight of Evidence Characterization summaries. This information is taken verbatim from EPA's IRIS database and represents the EPA's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures.

- Benzene is characterized as a known human carcinogen.
- The potential carcinogenicity of acrolein cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.
- Formaldehyde is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.

Table 3.13-2
Summary of Maximum Ambient Air Monitoring Levels

Pollutant	Averaging Time	2001	2002	2003	2004	2005	2006
CO (ppm)	1-Hour	6.0	5.8	5.5	4.2	4.2	4.2
	Days of State Exceedances	0	0	0	0	0	0
	Days of Federal Exceedances	0	0	0	0	0	0
	8-Hour	4.74	4.56	4.66	3.37	3.51	3.36
	Days of State Exceedances	0	0	0	0	0	0
	Days of Federal Exceedances	0	0	0	0	0	0
O_3 (ppm)	1-Hour	0.091	0.084	0.099	0.090	0.091	0.081
	Days of State Exceedances	0	0	1	0	0	0
	8-Hour	0.070	0.064	0.068	0.074	0.069	0.058
	Days of State Exceedances	--	--	--	--	--	--
	Days of Federal Exceedances	0	0	0	0	0	0
NO_2 (ppm)	Annual Average	0.030	0.029	0.029	0.028	0.024	0.022
	Federal Exceedances	0	0	0	0	0	0
	1-Hour	0.122	0.130	0.135	0.121	0.136	0.102
	Days of State Exceedances	0	0	0	0	0	0
SO_2 (ppm)	Annual Average	0.002	0.002	0.002	0.005	0.002	0.001
	Federal Exceedances	0	0	0	0	0	0
	24-Hour	0.009	0.008	0.008	0.013	0.010	0.010
	Days of State Exceedances	0	0	0	0	0	0
	Days of Federal Exceedances	0	0	0	0	0	0
	3-Hour	0.027	0.026	0.020	0.026	0.033	0.023
	Days of Federal Exceedances	0	0	0	0	0	0
	1-Hour	0.047	0.030	0.033	0.042	0.041	0.027
	Days of State Exceedances	0	0	0	0	0	0

Table 3.13-2
Summary of Maximum Ambient Air Monitoring Levels

Pollutant	Averaging Time	2001	2002	2003	2004	2005	2006
PM_{10} (µg/m^3)	Annual Arithmetic Mean	37	36	33	33	30	31
	State Exceedances	1	1	1	1	1	1
	24-Hour	91	74	63	72	66	78
	Days of State Exceedances	10	5	4	5	4	5
	Days of Federal Exceedances	0	0	0	0	0	0
$PM_{2.5}$ (µg/m^3)	Annual Arithmetic Mean	21.2	19.5	18	17.9	15.9	14.1
	State Exceedances	1	1	1	1	1	1
	Federal Exceedances	1	1	1	1	1	0
	24-Hour	72.9	62.7	115.2	66.6	53.8	58.5
	Days of Federal Exceedances	1	0	3	1	0	0

Notes:
1. Monitoring data from the North Long Beach Monitoring Station (060374002) monitor.
2. Hydrogen sulfide, vinyl chloride, and visibility-reducing particles are not monitored.

ppm parts per million
µg/m^3 micrograms per cubic meter

Source: CARB, 2007b, www.arb.ca.gov/adam/welcome, as of July 2007.
EPA, 2007, www.epa.gov/air/data, as of July 2007.

- 1,3-butadiene is characterized as carcinogenic to humans by inhalation.
- Acetaldehyde is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.
- Diesel exhaust is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases.

Diesel exhaust also represents chronic respiratory effects, possibly the primary non-cancer hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms, such as cough, phlegm, and chronic bronchitis. The SCAQMD recently completed the Multiple Air Toxics Exposure Study III (MATES-III), which is a monitoring and risk evaluation study conducted periodically in the South Coast Air Basin (SCAQMD, 2008). The MATES-III study included a monitoring program, an updated emissions inventory of toxic air contaminants (TACs), and a modeling effort to characterize risk across the Basin (SCAQMD, 2008). Compared to previous studies of air toxics in the Basin, the MATES-III study found decreasing risks for air toxics exposures (SCAQMD, 2008). Although the study showed exposures to emissions of air toxics are being reduced overall, the study concludes that the risks remain unacceptable, and are higher near areas such as the ports and transportation corridors (SCAQMD, 2008). The highest risks were found near the Port area, in areas near central Los Angeles, and in areas near transportation corridors (SCAQMD, 2008).

In addition to the MATES-III study, the following studies also correlated adverse health impacts from exposure to diesel particulate matter near the Ports and roadways:

- California Air Resources Board. 2006. Final Diesel Particulate Matter Exposure Assessment Study for the Ports of Los Angeles and Long Beach.
- Green, R.S. Smorodinsky S., Kim J.J., et al. Proximity of California Public Schools to Busy Roads. January 2004. Environmental Health Perspectives 2004; 112:61-66.
- Kim J.J., Smorodinsky S., Lipsett M., et al. Traffic-Related Air Pollution Near Busy Roads. The East Bay Children's Respiratory Health Study. June 2004. American Journal of Respiratory and Critical Care Medicine 2004; 170:520-526.
- Zhu Y., Hinds W., Kim S., Sioutas C. Concentration and Size Distribution of Ultrafine Particles Near a Major Highway. Journal of Air and Waste Management Association. September 2002. 52: 1032-1042.

There have also been several other monitoring studies in the area near the proposed action. The ARB conducted a special Community Air Quality Monitoring Study in which monitoring data and potential cancer risks at the Wilmington School and North Long Beach stations were evaluated, with the exception of risks identified for diesel PM_{10} (ARB, 2003). The study found that PM_{10} concentrations measured at Wilmington School were higher than the levels measured at the North Long Beach station (ARB, 2003). The following are additional references of completed monitoring studies and on-going monitoring near the proposed action:

- SCAQMD MATES-III Study included ten monitoring sites. The monitoring data is available at http://www.aqmd.gov/prdas/matesIII/matesIII.html
- SCAQMD Rule 1158 studies which include monitoring data from Elizabeth Hudson Elementary School. These studies are available at http://www.aqmd.gov/tao/Rule1158Studies.htm
- The Port of Los Angeles air quality monitoring stations includes two community stations; one station is the Wilmington Community Station and the other station is the San Pedro Community Station. These monitoring stations have been operational since February 2005. The monitoring data is available at http://www.portoflosangeles.org/environment_aqm_results.htm
- ARB monitors toxics at the North Long Beach Station. Information about the monitoring network and monitoring data is available at http://www.arb.ca.gov/aaqm/toxics.htm

3.13.2.2.3 Greenhouse Gases

The final category of pollutants included as part of the ambient air discussion is greenhouse gases. Greenhouse gases (GHG) include the following pollutants (EPA, 2007):

- Carbon dioxide (CO_2) is a naturally occurring gas, and also a by-product of burning fossil fuels and biomass, as well as land-use changes, and other industrial processes. It is the principal anthropogenic greenhouse gas that affects the Earth's radiative balance.
- Methane (CH_4) is a greenhouse gas with a global warming potential most recently estimated at 23 times that of CO_2. CH_4 is produced through anaerobic (without oxygen) decomposition of waste in landfills, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.
- Nitrous oxide (N_2O) is a greenhouse gas with a global warming potential of 296 times that of CO_2. Major sources of nitrous oxide include soil cultivation practices, especially the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning.
- Hydrofluorocarbons (HFCs) are compounds containing only hydrogen, fluorine, chlorine, and carbon. HFCs have been introduced as a replacement for the chlorofluorocarbons identified as ozone depleting substances.
- Perfluorocarbons (PFCs) are compounds containing only fluorine and carbon. Similar to HFCs, PFCs have been introduced as a replacement for chlorofluorocarbons. PFCs are also used in manufacturing and emitted as by-products of industrial processes. PFCs are powerful greenhouse gases.
- Sulfur hexafluoride (SF_6) is a colorless gas soluble in alcohol and ether, and slightly soluble in water. It is a very powerful greenhouse gas used primarily in electrical transmission and distribution systems, as well as dielectrics in electronics.

Caltrans and its parent agency, the Business, Transportation, and Housing Agency, have taken an active role in addressing GHG emission reduction and climate change. Recognizing that 98 percent of California's GHG emissions are from the burning of fossil fuels, and 40 percent of all human made GHG emissions are from transportation, Caltrans

has created and is implementing the Climate Action Program at Caltrans (Caltrans, 2006). One of the main strategies in the Caltrans Climate Action Program to reduce GHG emissions is to make California's transportation system more efficient. The highest levels of carbon dioxide from mobile sources, such as automobiles, occur at stop-and-go speeds (0-25 miles per hour [mph]) and speeds over 55 mph; the most severe emissions occur from 0-25 miles per hour. Relieving congestion by enhancing operations and improving travel times in high congestion travel corridors will lead to an overall reduction in GHG emissions. The proposed project would be expected to relieve congestion and improve travel times, which may result in an overall reduction of GHG emissions.

Additional measures have the potential to reduce GHG emissions. These measures include using reclaimed water, landscaping, energy efficient lighting, and idling restrictions. The following presents a brief discussion of these measures.

- Reclaimed Water - It is estimated that 30 percent of the electricity used in California is used for the treatment and delivery of water. Using reclaimed water helps conserve energy and reduces GHG emissions from electricity production. Reclaimed water would be used, if available, during construction and operation of the proposed project.
- Landscaping - Landscaping would reduce surface warming and through photosynthesis would decrease carbon dioxide. Two avoidance and mitigation measures, included with Section 3.7 (VR-3 and VR-4), incorporate landscaping as elements of the proposed project design, which includes planting trees and vines at specified locations, as determined by a Caltrans Licensed Landscape Architect. Implementation of these measures would also have the potential to reduce GHG emissions.
- Energy efficient lighting - Energy efficient streetlights and LED traffic signals would be incorporated, to the extent feasible, in the final design of the proposed project.
- Idling restrictions for trucks - Section 3.13.4 includes a mitigation measure (AQ-6) that would prohibit truck idling in excess of 2 minutes during construction. This measure would be expected to also reduce GHG emissions during construction.

Implementation of these measures has the potential to reduce GHG emissions in addition to the reductions expected from operation of the proposed project.

3.13.2.3 Attainment Status

The federal CAA requires the EPA to designate areas in the country as attainment or nonattainment with respect to each criteria pollutant, depending on whether the areas meet the national ambient air quality standards. Similarly, the California CAA requires the ARB to designate areas in the state as attainment or nonattainment, depending on whether the areas meet the California ambient air quality standards. (Section 3.13.1.1 provides a detailed discussion of the federal CAA.) Both the EPA and ARB have used counties as the areas to designate attainment/nonattainment status in California. Table 3.13-3 presents the current State and Federal designations for Los Angeles County, which includes the project area.

Table 3.13-3
State and Federal Air Quality Designations for Los Angeles County (as of October 2008)

Pollutant	State Designation	Federal Designation
Ozone (8-hour)	Nonattainment	Severe Nonattainment
Ozone (1-hour)	Nonattainment	Revoked [70 FR 44470] [1]
PM_{10}	Nonattainment	Serious Nonattainment
$PM_{2.5}$	Nonattainment	Nonattainment
CO	Attainment	Attainment/Maintenance [2]
NO_2	Attainment	Attainment/Maintenance
All Others	Attainment/Unclassified	Attainment/Unclassified

Notes:

1. On June 15, 2005, the 1-hour ozone standard of 0.12 parts per million (ppm) was revoked for all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) areas. (Those areas do not yet have an effective date for their 8-hour designations.)
2. EPA has re-designated South Coast Air Basin as attainment for CO, effective June 11, 2007.

Data sources:

CARB, 2006 State Area Designations, http://www.arb.ca.gov/desig/desig.htm, accessed in July 2007.

EPA, www.epa.gov/air/oaqps/greenbk/index.html, federal designation as of June 15, 2007.

3.13.2.4 Sensitive Receptors

Sensitive air quality receptors, as defined by the SCAMQD (2006), include receptors such as residences, schools, and hospitals. The ambient air concentrations shown in Table 3.13-2 are representative of the existing conditions experienced by sensitive receptors located near the project area. The immediate vicinity of the project area includes the Port of Long Beach and the community of Wilmington in Los Angeles. The community of Wilmington is just west of the proposed SR 47 Expressway and includes sensitive air quality receptors such as residences, schools, and hospitals. The nearest hospital is located about 1.4 miles northwest of the north end of the proposed SR-47 Expressway. The nearest residences are approximately 100 feet west of the SR 47 Expressway near Alameda Street and Henry Ford Avenue. The school nearest to the proposed project is the Wilmington Park School at 1140 Mahar Avenue, approximately 700 feet west of the connection of proposed SR-47 and Alameda Street. Other schools in the area include:

- Holy Family Grammar School (1122 Roubidoux)
- Phineas Banning High School (1527 Lakme Avenue)
- Bonita Street Elementary School (21929 Bonita Street)
- Webster Elementary School (1755 West 32 Way)
- Elizabeth Hudson Elementary School (2335 Webster Avenue)
- Muir Elementary School (3038 Delta Avenue)
- California Heights Parent Participation Nursery School (1500 East Carson Street)
- Reid High School (2152 West Hill Street)
- Mary McLeod Bethune Child Development Center (2041 San Gabriel Avenue)
- Stephens William Logan Middle School (1830 West Columbia Street)
- Cabrillo High School (2001 Santa Fe Avenue)

Residences are also located aboard moored vessels in the marina to the west of the Schuyler Heim and Henry Ford bridges. Along the northern border of the project area, there are residences located in the City of Carson between Dominguez Street and I-405. The Long Beach Silverado Senior Center is located near the project area at 1545 West 31st Street.

3.13.3 Environmental Consequences

3.13.3.1 Federal Evaluation Criteria

3.13.3.1.1 Transportation Conformity

As stated above, the following items are required to demonstrate project-level conformity for the SR-47 Expressway:

- The project is listed in a conforming RTP and RTIP.
- The design concept and scope that were in place at the time of the conformity finding are maintained through implementation.
- The project design concept and scope must be defined sufficiently to determine emissions at the time of the conformity determination.
- The project must not cause a new local violation of the federal standards for CO, PM_{10}, or $PM_{2.5}$ or exacerbate an existing violation of the federal standards for CO, PM_{10}, or $PM_{2.5}$.

3.13.3.1.2 Mobile Source Air Toxics

Currently, there are no established criteria for determining when MSAT emissions should be considered a significant issue in the NEPA context. FHWA has developed an interim guidance on how to analyze MSATs in the NEPA process for highways. Depending on the specific project circumstances, FHWA has identified three levels of analysis depending on a project's potential MSAT impacts: (1) no analysis for projects with no potential for meaningful MSAT effects; (2) qualitative analysis for projects with low potential MSAT effects; and (3) quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects.

3.13.3.2 State Evaluation Criteria

Public agencies are authorized to establish thresholds of significance that the agency will use to determine the significance of environmental effects (PRC Section 21082 and CEQA Guidelines Section 15064.7). These thresholds are meant to promote "consistency, efficiency, and predictability in the initial study process" (OPR, *Thresholds of Significance: Criteria for Defining Environmental Significance* [CEQA Technical Advice Series, September 1994]). As Caltrans has statewide jurisdiction, it has not and has no intention to develop thresholds of significance for CEQA. Caltrans made this decision because the setting for projects varies so extensively across the state and the significance of an effect depends on the environmental setting. Rather, Caltrans will continue to analyze significance on a case-by-case basis looking at the degree and intensity of the impacts.

Thresholds of significance are only binding upon those agencies that have formally adopted them. As explained above, Caltrans has not adopted thresholds, and is not subject to local jurisdictions or their thresholds of significance. Caltrans chooses to continue to look at significance on a case-by-case basis because its projects are scattered throughout the state and often cross jurisdictional lines. Each jurisdiction within the state has the potential to set different thresholds. Even if a project is wholly within one jurisdiction, following an

individual jurisdiction's thresholds will lead to Caltrans needing to defend its decision to accept certain thresholds in one location, yet not in another. In order to preserve its ability to determine the significance of impacts a specific project will have on the environment, Caltrans declines to follow local thresholds of significance. However, Caltrans remains committed to thoroughly analyzing impacts and incorporating measures to avoid, minimize, and if necessary, mitigate, them.

Chapter 4.0, CEQA Analysis, contains Caltrans' evaluation of the potential impacts of the proposed project alternatives in the context of CEQA criteria for Air Quality.

3.13.3.3 Regional and Local Evaluation Criteria

3.13.3.3.1 Criteria Pollutant Emissions Thresholds

In addition to the CEQA criteria, the SCAQMD has recommendations for construction and operation significance thresholds. Air quality impacts resulting from construction were deemed significant if daily emission estimates were above the significance thresholds for construction emissions provided in the SCAQMD CEQA Air Quality Handbook (SCAQMD, 2006). The construction emission thresholds are provided below.

- 75 pounds per day ROG
- 100 pounds per day NO_X
- 550 pounds per day CO
- 55 pounds per day $PM_{2.5}$
- 150 pounds per day PM_{10}
- 150 pounds per day SO_X

Indirect impacts resulting from marine vessel emissions would be considered significant if the resulting increase would be above the significance thresholds for operational emissions provided in the SCAQMD CEQA Air Quality Handbook (SCAQMD, 2006). The operational emission thresholds are provided below.

- 55 pounds per day ROG
- 55 pounds per day NO_X
- 550 pounds per day CO
- 55 pounds per day $PM_{2.5}$
- 150 pounds per day PM_{10}
- 150 pounds per day SO_X

3.13.3.3.2 Health Risk Assessment Thresholds

Two approaches were considered for the Health Risk Assessment (HRA) thresholds. As summarized below, the first presents the Caltrans' approach and the second presents Alameda Corridor Transportation Authority's (ACTA) approach to HRA thresholds.

Caltrans Approach on HRA Thresholds

Caltrans has not adopted HRA thresholds and is not subject to local jurisdictions or their thresholds of significance. However, Caltrans remains committed to thoroughly analyzing air quality impacts and incorporating measures to avoid, minimize and if necessary mitigate them.

ACTA's Approach on HRA Thresholds:

Pursuant to the City of L.A. and SCAQMD CEQA thresholds, health risk is considered significant if the incremental increase of cancer risk due to a project exceeds ten in one million (10×10^{-6}) or if the increase of chronic or acute hazard index from the project exceed 1.0.

Cancer, chronic and acute risk thresholds are typically applied to stationary sources of emissions rather than linear mobile sources such as the proposed project. However, for purposes of the proposed project analysis, ACTA, a joint powers authority of which both the City of Los Angeles and the Port of Los Angeles are members, elected to conduct an HRA as part of its funded portion of the proposed project and to use the health risk significance levels from the City of L.A. Thresholds Guideline (consistent with the SCAQMD thresholds). Therefore, ACTA would consider the health risk to be significant if the incremental increase of cancer risk due to a project exceeds ten in one million (10×10^{-6}) or if the increase of chronic or acute hazard index from the project exceed 1.0.

3.13.3.4 Methodology

3.13.3.4.1 Transportation Conformity

Project-level transportation conformity is demonstrated by inclusion of the project in the adopted RTP and approved RTIP. Both the regional-level and project–level CO, PM_{10}, and $PM_{2.5}$ hot spot analyses for the proposed build alternatives during project operations will have been addressed as required by the regional plan and program. The hot spot analyses were based on the Caltrans guidance document, *Transportation Project-Level Carbon Monoxide Protoco*l (*CO Protocol*) (UCD, 1997), the *Technical Report: Particulate Matter and Transportation Project Analysis Protocol* (PM_{10} protocol) (UCD, Caltrans, FHWA; 2005), and the FHWA/EPA guidance document, *Transportation Conformity Guidance for Qualitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* (EPA, 2006). The CO hot spot modeling was performed using CAL3QHC according to the methodology outlined in the *CO Protocol*. CO emission factors were calculated with EMFAC2007, using default vehicle population data for the Basin. The modeled CO concentrations were combined with the predicted CO background concentrations and compared with the air quality standards. The CO hot spot analysis is summarized in Section 3.13.3.4.1.2. The PM_{10} and $PM_{2.5}$ hot spot analyses are summarized in Section 3.13.3.4.1.3. Detailed documentation of the CO and $PM_{2.5}$ hotspot analyses are available in appendixes to the Air Quality Technical Study (Caltrans, 2008).

The proposed Schuyler Heim Bridge Replacement and SR-47 Expressway Project (Project ID: LA0D45) is included in the Southern California Association of Governments (SCAG) conforming 2008 RTP and 2006 RTIP (through amendment #13), as well as the 2008 RTIP that was adopted by SCAG on July 17, 2008. Federal approval of the 2008 RTIP is expected by mid-November 2008.

3.13.3.4.1.1 Vehicle Operations Emissions

The Schuyler Heim Bridge/SR-47 project is consistent with the 2008 RTP and 2006 RTIP (through amendment #13), and the adopted 2008 RTIP that was approved by SCAG in July 2008. The project meets the regional transportation conformity requirements. The vehicle operations emissions were included in this section for illustration purposes only.

Criteria pollutant emissions are predicted to decrease in future years for both the No Build and Build Alternatives when compared to the existing conditions. As shown in Table 3.13-4, criteria pollutant emissions from Alternatives 1 and 3 are lower than emissions from the No Build alternative due to a predicted decrease in vehicle miles traveled (VMT) in the study area for 2011, 2015, and 2030. Emissions for Alternative 4 are predicted to be the same as those for the No Build alternative because VMT in the project area is predicted to be the same. CO emissions from Alternative 2 in 2011 and 2015 are slightly higher than the No Build alternative because Alternative 2 has a higher passenger car VMT. Increased VMT for Alternative 2 is attributable to increased capacity from the extension of SR-103. All future year scenarios have emissions less than the baseline 2003 conditions. This decrease in emissions over time can be attributed to EPA and ARB regulations that would require cleaner fuels and cleaner engines in future years.

Table 3.13-4
Peak Daily Vehicle Emissions for the Project Study Area

Year	Alternative	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
2003	Existing Conditions	54,560	26,620	2,893	207	1,131	901
2011	No Build	24,544	18,138	1,417	52	876	669
	Alternative 1	24,399	17,989	1,402	52	871	665
	Alternative 2	24,635	16,934	1,364	51	836	632
	Alternative 3	24,399	17,989	1,402	52	871	665
	Alternative 4	24,544	18,138	1,417	52	876	669
2015	No Build	19,161	13,114	1,096	57	784	577
	Alternative 1	18,988	12,967	1,079	57	779	574
	Alternative 2	19,188	13,165	1,093	57	789	582
	Alternative 3	18,988	12,967	1,079	57	779	574
	Alternative 4	19,161	13,114	1,096	57	784	577
2030	No Build	11,153	5,902	704	72	629	455
	Alternative 1	10,870	5,704	664	72	625	441
	Alternative 2	10,960	5,770	671	72	631	445
	Alternative 3	10,870	5,704	664	72	625	441
	Alternative 4	11,153	5,902	704	72	629	455

3.13.3.4.1.2 Localized CO Effects

The fourth criteria for demonstrating transportation conformity is an analysis of CO, PM_{10}, and $PM_{2.5}$ hot spots. Localized CO effects were assessed by estimating the maximum ambient CO concentrations near the intersections assumed to have the greatest potential effect for the buildout and planning horizon years of 2011 and 2030, respectively. The predicted concentrations were compared to the NAAQS and CAAQS for CO. Detailed input values and modeling files are available in the Air Quality Technical Study (Caltrans, 2008). Maximum 1-hour and 8-hour CO concentrations were estimated at each of the eight

intersections for the build and the No Build alternatives. Potential effects were assessed for the base year, 2003, and multiple build alternatives for 2011 and 2030 using the respective PM peak-hour traffic projections (Caltrans, 2008). In addition, CO hotspot modeling was also performed for the two intersections that are affected by the flyover in 2015. The majority of the project will be complete by the opening year of 2011; however, the flyover at Ocean Boulevard and SR-47 will be complete in 2015.

Table 3.13-5 presents the peak 1-hour and 8-hour CO concentrations for the baseline conditions in 2003. Table 3.13-6 presents the peak 1-hour and 8-hour CO concentrations predicted under no build and buildout conditions (2011 and 2030). Table 3.13-7 presents the peak 1-hour and 8-hour CO concentrations predicted under no build and buildout conditions for the year 2015 when the flyover will be complete. Tables 3.13-5, 3.13-6, and 3.13-7 show that the maximum 1-hour CO concentrations and the maximum 8-hour CO concentrations would be well below both the state and federal standards. Based on the results of this analysis, the proposed project would not contribute to a violation of the CO standards.

Table 3.13-5
Maximum Predicted CO Concentrations, Base Conditions (2003)

Intersection	Maximum 1-Hour CO Concentration (ppm)	Maximum 8-Hour CO Concentration (ppm)
Henry Ford Avenue/Anaheim Street	7.1	5.8
Alameda Street/Anaheim Street	7.1	5.8
Alameda Street/Pacific Coast Highway north of Pacific Coast Highway	6.4	5.3
Alameda Street/Sepulveda Boulevard north of Sepulveda	7.2	5.9
Alameda Street/Sepulveda Boulevard east of Alameda	7.2	5.9
Alameda Street/223rd Street south of 223rd Street	6.5	5.4
Ocean Boulevard. Westbound/SR-47	N/A	N/A
Ocean Boulevard. Eastbound/SR-47	N/A	N/A
National Ambient Air Quality Standards	35	9
California Ambient Air Quality Standards	20	9

Notes:

1. Concentrations include a predicted 1-hour background concentration of 5.5 ppm and an 8-hour background concentration of 4.7 ppm, representing the measured CO concentrations from 2003
2. Ocean Boulevard ramps do not exist in Base 2003 scenario.
3. The maximum 8-hour CO concentration was calculated by multiplying the project level 1-hour CO concentration by the 8-hour persistence factor (0.7) and adding the 8-hour CO background concentration (4.7 ppm).

Table 3.13-6
Maximum Predicted CO Concentrations – 2011 and 2030

Intersection	Alternative	Maximum 1-Hour CO Concentration (ppm)		Maximum 8-Hour CO Concentration (ppm)	
		2011	2030	2011	2030
Henry Ford Avenue/ Anaheim Street	No Build	5.9	5.6	4.5	4.3
	Alt 1 - PM Peak Hour	5.8	5.6	4.4	4.3
	Alt 2 - PM Peak Hour	5.8	5.5	4.4	4.2
	Alt 3 - PM Peak Hour	5.8	5.6	4.4	4.3
	Alt 4 - PM Peak Hour	5.9	5.6	4.5	4.3
Alameda Street/Anaheim Street	No Build	5.9	5.6	4.5	4.3
	Alt 1 - PM Peak Hour	5.8	5.6	4.4	4.3
	Alt 2 - PM Peak Hour	5.8	5.5	4.4	4.2
	Alt 3 - PM Peak Hour	5.8	5.6	4.4	4.3
	Alt 4 - PM Peak Hour	5.9	5.6	4.5	4.3
Alameda Street/PCH	No Build	5.6	5.4	4.3	4.1
	Alt 1 - PM Peak Hour	5.6	5.5	4.3	4.2
	Alt 2 - PM Peak Hour	5.5	5.3	4.2	4.0
	Alt 3 - PM Peak Hour	5.6	5.5	4.3	4.2
	Alt 4 - PM Peak Hour	5.6	5.4	4.3	4.1
Alameda Street North of Sepulveda Boulevard	No Build	6	5.8	4.5	4.4
	Alt 1 - PM Peak Hour	6.2	5.8	4.7	4.4
	Alt 2 - PM Peak Hour	6.5	5.7	4.9	4.3
	Alt 3 - PM Peak Hour	6.2	5.8	4.7	4.4
	Alt 4 - PM Peak Hour	6	5.8	4.5	4.4
Sepulveda Boulevard east of Alameda Street	No Build	6	5.8	4.5	4.4
	Alt 1 - PM Peak Hour	6.2	5.8	4.7	4.4
	Alt 2 - PM Peak Hour	6.5	5.7	4.9	4.3
	Alt 3 - PM Peak Hour	6.2	5.8	4.7	4.4
	Alt 4 - PM Peak Hour	6	5.8	4.5	4.4
Alameda Street/223rd Street	No Build	5.6	5.5	4.3	4.2
	Alt 1 - PM Peak Hour	5.7	5.4	4.3	4.1
	Alt 2 - PM Peak Hour	5.6	5.6	4.3	4.3
	Alt 3 - PM Peak Hour	5.7	5.4	4.3	4.1
	Alt 4 - PM Peak Hour	5.6	5.5	4.3	4.2

Table 3.13-6
Maximum Predicted CO Concentrations – 2011 and 2030

Intersection	Alternative	Maximum 1-Hour CO Concentration (ppm)		Maximum 8-Hour CO Concentration (ppm)	
		2011	2030	2011	2030
Ocean Boulevard Westbound/SR-47	No Build	5.5	5.5	4.2	4.2
	Alt 1 - PM Peak Hour	5.7	5.4	4.3	4.1
	Alt 2 - PM Peak Hour	5.7	5.4	4.3	4.1
	Alt 3 - PM Peak Hour	5.7	5.4	4.3	4.1
	Alt 4 - PM Peak Hour	5.5	5.5	4.2	4.2
Ocean Boulevard Eastbound/SR-47	No Build	5.5	5.5	4.2	4.2
	Alt 1 - PM Peak Hour	5.7	5.4	4.3	4.1
	Alt 2 - PM Peak Hour	5.7	5.4	4.3	4.1
	Alt 3 - PM Peak Hour	5.7	5.4	4.3	4.1
	Alt 4 - PM Peak Hour	5.5	5.5	4.2	4.2
National Ambient Air Quality Standards		35		9	
California Ambient Air Quality Standards		20		9	

Notes:
1. Concentrations include a predicted 1-hour background concentration of 5.1 ppm and an 8-hour background concentration of 3.9 ppm in 2011 and 2030. These are the predicted future concentrations for 2010 and 2020 from SCAQMD CO Concentrations, http://www.aqmd.gov/ceqa/handbook/CO/CO.html.
2. The maximum 8-hour CO concentration was calculated by multiplying the project level 1-hour CO concentration by the 8-hour persistence factor (0.7) and adding the 8-hour CO background concentration (3.9 ppm).

Table 3.13-7
Maximum Predicted CO Concentrations – 2015

Intersection	Alternative	Maximum 1-Hour CO Concentration (ppm)	Maximum 8-Hour CO Concentration (ppm)
		2015	2015
Ocean Blvd. Westbound/SR-47	No Build	5.6	4.3
	Alt 1 - PM Peak Hour	5.7	4.3
	Alt 2 - PM Peak Hour	5.5	4.2
	Alt 3 - PM Peak Hour	5.7	4.3
	Alt 4 - PM Peak Hour	5.6	4.3
Ocean Blvd. Eastbound/SR-47	No Build	5.6	4.3
	Alt 1 - PM Peak Hour	5.7	4.3
	Alt 2 - PM Peak Hour	5.5	4.2
	Alt 3 - PM Peak Hour	5.7	4.3
	Alt 4 - PM Peak Hour	5.6	4.3

Table 3.13-7
Maximum Predicted CO Concentrations – 2015

Intersection	Alternative	Maximum 1-Hour CO Concentration (ppm) 2015	Maximum 8-Hour CO Concentration (ppm) 2015
National Ambient Air Quality Standards		35	9
California Ambient Air Quality Standards		20	9

Notes:
1. Concentrations include a predicted 1-hour background concentration of 5.1 ppm and an 8-hour background concentration of 3.9 ppm in 2015. These are the predicted future concentrations for 2015 (SCAQMD CO Concentrations, http://www.aqmd.gov/ceqa/handbook/CO/CO.html).
2. The maximum 8-hour CO concentration is calculated by multiplying the project level 1-hour CO contribution by the 8-hour persistence factor (0.7) and adding the 8-hour CO background concentration.
3. The NAAQS for CO are 35 ppm (1-hour) and 9 ppm (8-hour). The CAAQS for CO are 20 ppm (1-hour) and 9 ppm (8-hour).

3.13.3.4.1.3 Localized PM_{10} and $PM_{2.5}$

Localized PM_{10} and $PM_{2.5}$ effects were analyzed following the *Technical Report: Particulate Matter and Transportation Project Analysis Protocol* (PM_{10} protocol) (UCD, Caltrans, FHWA; 2005) and the *Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in PM_{10} and $PM_{2.5}$ Nonattainment and Maintenance Area* (EPA, 2006) (PM Guide). On March 10, 2006, EPA issued amendments to the Transportation Conformity Rule to address localized impacts of particulate matter: "*$PM_{2.5}$ and PM_{10} Hot-Spot Analyses in Project-level Transportation Conformity Determinations for the New $PM_{2.5}$ and Existing PM_{10} National Ambient Air Quality Standards*" (71 FR 12468). As required by the amended transportation conformity rule, a qualitative $PM_{2.5}$ hot spot analysis is included as part of the project-level conformity analysis. As stated in the PM Guide, "any PM_{10} hot-spot analysis that was started prior to this release…may be completed with the previous guidance." Therefore, the PM_{10} hot-spot analysis was completed following previous guidance (PM_{10} Protocol). A more detailed description of the PM_{10} and$PM_{2.5}$ analyses are contained in the Air Quality Technical Study (Caltrans, 2008).

Localized PM_{10} Impacts

At the local scale, a qualitative PM_{10} hot spot analysis was performed for the project following the *Technical Report: Particulate Matter and Transportation Project Analysis Protocol* (PM_{10} protocol) (UCD, Caltrans, FHWA; 2005). The PM_{10} hot spot analysis was performed using the "threshold screening" method, which includes both 24-hour and annual screening tests. Although the federal annual PM_{10} standard was revoked, effective in December 2006, following the 2005 guidance, the annual PM_{10} analysis was included in the report.

24-hour PM_{10} Screening Test

The PM_{10} screening test is a conservative approach to evaluate the potential incremental PM_{10} contribution from a project. The first step of the screening test does not use any project specific data. This step conservatively assumes that the incremental increase in the PM_{10} ambient concentrations due to a project would be 29.6 $\mu g/m^3$. This value is the highest PM_{10} contribution of all roadway type projects observed in the available literature (Ashbaugh et al., 1996; UCD, Caltrans, and FHWA, 2005). As shown in Table 3.13-2, no violations of the

24-hour federal PM_{10} standard have been recorded at the nearest PM_{10} monitoring station, North Long Beach Station, for the past 3 years (2004 to 2006). The data from 2004 through 2006 show that maximum 24-hour concentrations of PM_{10} during each year were 72, 66, and 78 μg/m³, respectively, or 48, 44, and 52 percent of the NAAQS. Because ambient concentrations are less than 120 μg/m³ or 80 percent of the NAAQS, and no unusual circumstances are expected with the project compared to existing conditions, the proposed action would be unlikely to contribute to a violation of the 24-hour PM_{10} NAAQS.

Annual PM_{10} Screening Test

General Screening Test. The approach of the annual PM_{10} screening test is similar to the 24-hour PM_{10} screening test, except that the field data were unavailable to directly estimate annual roadway incremental PM_{10} contributions. Consequently, the annual increment was estimated by applying a conversion ratio (CR=0.06) to convert the 24-hour increment value (29.6 μg/m³) to an annual value (17.8 μg/m³). Using the worst-case 24-hour PM_{10} increment of 29.6 μg/m³ and the worst-case CR, the worst-case annual PM_{10} incremental increase of a project would be 17.8 μg/m³. As shown in Table 3.13-2, the highest background annual PM_{10} concentration measured at the North Long Beach Station during the last 3 years was 33 μg/m³. This background concentration is greater than the 32 μg/m³ screening value (50 μg/m³ minus 17.8 μg/m³) and would result in a total concentration exceeding the NAAQS of 50 μg/m³, when added to the worst-case 17.8 μg/m³ increment. Based on these results, a refined screening analysis was performed using project-specific information.

Refined Screening Test. For this analysis, the project was considered a freeway because the build alternatives of the proposed action include construction of the SHB and the SR-47 or SR-103 Expressway. The estimated annual PM_{10} increment would be 2.9 μg/m³ due to the project. This increment was compared to the allowable annual increment threshold to determine if a PM_{10} hot spot would occur during project. The maximum allowable annual increment of PM_{10} was calculated as 17 μg/m³ (50 μg/m³ minus 33 μg/m³). Because the estimated project PM_{10} increment of 2.9 μg/m³ is less than the allowable annual PM_{10} increment of 17 μg/m³, it was concluded that a PM_{10} hot spot violation of the annual standard would not occur as a result of the proposed action.

Conclusion

Following the PM_{10} Protocol, the proposed action has passed the project-level transportation conformity screening tests. The project would be unlikely to cause or contribute to a violation of the 24-hour or annual PM_{10} NAAQS.

Localized $PM_{2.5}$ Impacts

A qualitative $PM_{2.5}$ hot-spot analysis was performed following the *Transportation Conformity Guidance for Qualitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* (EPA, 2006) [PM Guide]. The proposed project is located in Los Angeles County, which is designated as nonattainment for the federal $PM_{2.5}$ standards and is required to attain and maintain the NAAQS. The current $PM_{2.5}$ 24-hour standard (35 μg/m³) became effective on December 17, 2006. However, the nonattainment designations are based on the previous 24-hour standard of 65 μg/m³. Therefore, $PM_{2.5}$ conformity for the proposed action was evaluated for the 24-hour standard of 65 μg/m³ and annual standard of 15 μg/m³. Based on the project types listed in the PM Guide, the proposed project would be categorized as a new or expanded highway project that would have a significant number of diesel vehicles, and would affect intersections that are at LOS D, E, or F with a significant number

of diesel vehicles. The proposed project would be considered a project of air quality concern based on the criteria listed in the final conformity rule (40 CFR 93.123 [b][1]). Therefore, a qualitative project-level hot spot assessment was conducted in order to assess whether the project would cause or contribute to any new localized $PM_{2.5}$ violations, or increase the frequency or severity of any existing violations, or delay timely attainment of the $PM_{2.5}$ NAAQS.

The hot spot analysis was based on directly emitted emissions, including, tailpipe, brake wear, and tire wear, because the direct emissions have the potential to cause nearby hot spots, or localized areas of elevated concentration. Re-entrained road dust was also included in the analysis. The emission inventories presented in the SCAQMD 2007 AQMP show that emissions from paved roads are the single largest contributor to directly emitted $PM_{2.5}$ emissions. Construction-related $PM_{2.5}$ emissions were not included in this hot spot analysis because these emissions would be considered temporary since construction would last less than 5 years (40 CFR 93.123[c][5]). Secondary $PM_{2.5}$ emissions would be associated with regional impacts and, therefore, are not included in a hot spot analysis. Appendix M of the Air Quality Technical Study of this project (Caltrans, 2008) contains the detailed $PM_{2.5}$ Hot-Spot Analysis that was submitted to the SCAG Transportation Conformity Working Group (TCWG). The $PM_{2.5}$ hot spot analysis was originally submitted and approved by the TCWG during the October 2006 meeting. However, changes to the design and scope of the project required that the $PM_{2.5}$ hot spot analysis be updated and re-submitted to the TCWG. The updated $PM_{2.5}$ hot spot analysis was submitted for review by the TCWG during the March 2008 and deemed acceptable for circulation.

Traffic Condition Improvements

The purpose of building the SR-47 Expressway or the SR-103 Extension along with the Schuyler Heim Bridge replacement is to reduce traffic congestion on local surface streets between Terminal Island and Pacific Coast Highway or I-405, as well as on I-110 and I-710. The project would also improve traffic conditions by eliminating at-grade railroad crossings and signalized intersections.

An increase of $PM_{2.5}$ emissions would occur if the project significantly increased VMT in the project area, and at locations where there are more traffic delays. The traffic delays would occur at the intersections where vehicles are accumulating and idling. It is unlikely that $PM_{2.5}$ hot spots would be associated with the proposed project because local accumulation and delay of vehicles would be reduced by the project. LOS would improve with the build alternatives when compared to the No Build alternative. Potential localized $PM_{2.5}$ increases associated with the slight increase in VMT would be offset by the increase of vehicle speed in the project area, which is an indication of reduced congestion and idling of vehicles. Thus, the project is not expected to cause any concern with respect to localized concentrations of $PM_{2.5}$.

Traffic Conditions and Air Quality

The traffic data near the North Long Beach monitoring station and the Long Beach-East Pacific Coast Highway monitoring station were reviewed to evaluate the relationship between traffic conditions and monitoring data. The Long Beach-East Pacific Coast Highway station was selected for comparison since it is located closer to the project area than the North Long Beach station. However, because the Long Beach-East Pacific Coast Highway station has only been operating since 2003, data from this station were not used in the hotspot analysis.

The annual average daily traffic (AADT) and truck percentages near the North Long Beach monitoring station and Long Beach-East Pacific Coast Highway monitoring station were reviewed. The North Long Beach station is located approximately 0.5 mile north of I-405 and one mile east of the I-405/I-710 junction. For the year 2006, the AADT at the I-405/I-710 junction was 290,000 (Caltrans, 2008b). In addition, the truck AADT for the largest trucks (5 axles) was 6,856, or 2.4 percent of the total AADT (Caltrans, 2008b). For comparison, the Long Beach-East Pacific Coast Highway monitoring station is located approximately 1 mile east of the Pacific Coast Highway (PCH)/I-710 junction. For the year 2006, the AADT at the PCH/I-710 junction was 48,000 (Caltrans, 2008b). In addition, the truck AADT for the largest trucks (5 axles) was 5,130, or 11 percent of the total AADT (Caltrans, 2008b). A review of the traffic data has shown that the largest truck volumes are similar for both monitoring stations.

In addition, the $PM_{2.5}$ monitoring values at the Long Beach-East Pacific Coast Highway monitoring station are similar to those at the North Long Beach monitoring station. For the years 2004, 2005, 2006 the 24-hour $PM_{2.5}$ concentrations measured at the Long Beach-East Pacific Coast Highway were 59.7 $\mu g/m^3$, 50.8 $\mu g/m^3$, and 53.6 $\mu g/m^3$, respectively. Comparing these concentrations to the concentrations reported in Table 3.13-2 for the North Long Beach station show the values are similar. Therefore, since the truck percentages and monitoring data at the North Long Beach station and Long Beach-East Pacific Coast Highway station are similar, the North Long Beach station reflects the same traffic conditions as at the project location, and the monitoring data are shown to be representative of ambient air quality for the project area.

Vehicle Exhaust Emissions

Table 3.13-4 presents emissions, including $PM_{2.5}$, from vehicles traveling in the project study area for the years 2003, 2011, 2015, and 2030. As shown in Table 3.13-4, $PM_{2.5}$ emissions from Alternatives 1, 1A, 2, and 3 would be slightly lower than those from the No Build alternative. The emissions in Table 3.13-4 were conservatively estimated based on the average vehicle speed for the entire project area. The emissions decrease for Alternatives 1, 1A, and 3 are due to a predicted decrease in VMT in the study area and an increase in vehicle speed for 2011, 2015, and 2030. Although there would be a slight increase in VMT for Alternative 2, due to increased capacity from the extension of SR-103, the $PM_{2.5}$ emissions for Alternative 2 in 2011 and 2030 would still be less than the No Build alternative. Emissions for Alternative 4 are predicted to be the same as those for the No Build alternative because the VMT and vehicle mix in the project area is predicted to be the same. Emissions for Alternative 3 are predicted to be the same as those for Alternative 1 because Alternative 3 would have the same traffic conditions as Alternative 1. Emissions associated with Alternative 5 were not discussed in this analysis because there is no traffic information available for Alternative 5.

Re-entrained Road Dust

Re-entrained road dust was estimated based on VMT and Chapter 13.2.1 of *AP-42, Fifth Edition, Compilation of Air Pollutant Emission Factors* (EPA, 2006). The emission inventories presented in the SCAQMD 2007 AQMP show that emissions from paved roads are the single largest contributor to directly emitted $PM_{2.5}$. According to the PM Guide, $PM_{2.5}$ emissions from re-entrained road dust must only be considered if the EPA or state air agency has made a finding that these emissions are a significant contributor to the $PM_{2.5}$ problem in a given area

(40 CFR 93.102[b][3]). Since the SCAQMD 2007 AQMP is incorporated as part of the California 2007 SIP, $PM_{2.5}$ from re-entrained roads was included in the hotspot analysis.

Table 3.13-8 presents the paved road emissions for the years 2003, 2011, 2015, and 2030. The $PM_{2.5}$ emissions for the build alternatives would be the same or less than the No Build alternative for each year analyzed. Paved road emissions are expected to increase with time because the calculation of paved road emissions is based on VMT and vehicle weight. Since the VMT and the percentage of trucks are predicted to increase with time, the paved road emissions would also increase with time. This finding is consistent with the emission inventories reported in the SCAQMD 2007 AQMP, which also shows paved road emissions increasing with time. Since paved road emissions are included in the 2007 AQMP, which is part of the California SIP, paved road emissions have been accounted for as part of the $PM_{2.5}$ attainment plan. Therefore, the proposed project is unlikely to cause new violations or increase the frequency or severity of any existing violations, or delay timely attainment of the $PM_{2.5}$ NAAQS.

Table 3.13-8
Daily Vehicle Re-Entrained Road Dust Emissions for the Project Study Area ($PM_{2.5}$)

Project Alternative	2003	2011	2015	2030
	lb/day	lb/day	lb/day	lb/day
No Build	6,430	7,182	8,448	11,941
Alternative 1, 1A	--	7,010	8,232	11,554
Alternative 2	--	6,181	8,393	11,724
Alternative 3	--	7,010	8,232	11,554
Alternative 4	--	7,182	8,448	11,941

Conclusion

In summary, $PM_{2.5}$ emissions resulting from vehicle exhaust and re-entrained road dust for the build alternatives would be the same or less than the No Build alternative. Based on the current ambient $PM_{2.5}$ concentrations in the project area (see Table 3.13-2), the project is not expected to have a significant localized $PM_{2.5}$ concentration increase when compared to the No Build alternative. Therefore, the project meets the conformity hot spot requirements in 40 CFR §93.116 and §93.123 for $PM_{2.5}$.

The project has demonstrated project-level conformity by its inclusion in the federally approved 2008 RTP, the 2006 RTIP (through amendment #13), the final 2008 RTIP adopted by SCAG, and by the hot spot analyses showing the proposed project would not cause or contribute to a violation of the CO, PM_{10}, or $PM_{2.5}$ federal standards.

3.13.3.4.2 Mobile Source Air Toxics

A quantitative MSAT analysis was prepared for the proposed project because major arterials affected by the project serve a large number of diesel trucks, and there would be a potential to concentrate high levels of diesel particulate matter. In addition, the immediate vicinity of the project area includes the community of Wilmington in Los Angeles. The community of Wilmington is just west of the proposed SR-47 Expressway and includes sensitive air quality receptors such as residences, schools, and hospitals. The project qualifies for a quantitative

MSAT analysis because: (1) the project would serve diesel trucks with the potential to concentrate diesel particulate matter; and (2) sensitive receptors are within the project area and near the project site. At this time, a quantitative MSAT analysis is intended to provide a method to compare alternatives rather than emphasizing the specific MSAT emission values or estimating health risk. The final subsection of the MSAT analysis provides a discussion of the limitations of the MSAT analysis.

The MSAT analysis was performed as required by the FHWA "*Interim Guidance on Air Toxic Analysis for National Environmental Policy Act (NEPA) Documents*" (Interim Guidance) and utilized the methodology and the software tool developed by University of California Davis (UCD, 2006). The University of California, Davis references, *Estimating Mobile Source Air Toxics Emissions: A Step-by-Step Project Analysis Methodology* (UCD, 2006), and software tool *Project-Level Mobile Source Air Toxics Analysis: Spreadsheet Tool*, version 1.2 (MSAT Tool), were used to develop benzene, acrolein, acetaldehyde, 1,3-butadiene, and formaldehyde emission factors from EMFAC2007 total organic gas (TOG) emission factors. The diesel particulate matter emission factors from EMFAC2007 were used to estimate diesel truck emissions. Emissions were estimated for automobiles, South Coast Air Basin trucks, and Port trucks for the major roadway segments in the project area. It was conservatively assumed that Port trucks in the years 2015 and 2030 would be heavy duty diesel trucks with model year 2007 or newer engines.

MSAT emissions were evaluated by roadway segments contained within the boundary of Highway 91 to the north, Interstate 110 (I-110) to the west, Interstate 710 (I-710) to the east, and Ocean Boulevard to the south. The following is a list of the roadway segments included in the MSAT analysis. Not all the roadway segments were included with each alternative. For example, the segment SR-103, Realignment to End (23rd and Wardlow) was only included for Alternative 2.

- SR-47 Mainline, New Dock Ramps to Henry Ford Ramps
- Henry Ford Ramps
- Henry Ford north of Ramps to Alameda
- SR-103 begin (at SR-47 /Henry Ford Junction) to Anaheim
- SR-103 Anaheim to Pacific Coast Highway (PCH)
- SR-103 PCH to Realignment (Sepulveda/Willow ramps)
- SR-103 Ramps south of Sepulveda/Willow
- SR-103, Realignment to End (223rd/Wardlow)
- E and W Harry Bridges, Figueroa to start Alameda
- Alameda beginning (E Harry Bridges) to Anaheim
- Alameda Anaheim to Henry Ford
- Alameda, Henry Ford to PCH
- Alameda PCH to 405
- Alameda 405 to del Amo
- Alameda, del Amo to South Santa Fe Avenue
- Alameda, South Santa Fe Avenue to SR-91
- I-110, "C" Street Interchange to Anaheim
- I-110, Anaheim to PCH
- 1-110, PCH to Sepulveda
- I-110, Sepulveda to Carson
- I-110, Carson to Del Amo
- I-110, Del Amo to 405
- I-110, 405 to SR-91
- I-710, Anaheim to PCH
- I-710, PCH to Willow
- I-710, Willow to 405
- I-710, 405 to Del Amo

- I-710, Del Amo to Long Beach Blvd Interchange
- I-710, Long Beach Boulevard to SR-91
- PCH, I-110 to Alameda
- PCH, Alameda to SR-103
- PCH, SR-103 to I-710
- Sepulveda, I-110 to Avalon
- Sepulveda, Avalon to Alameda
- Sepulveda, Alameda to ICTF
- Sepulveda, ICTF to SR-103
- Del Amo, I-110 to Wilmington
- Del Amo, Wilmington to Alameda
- Del Amo, Alameda to I-710
- 223rd Street, I-110 to Avalon
- 223rd Street, Avalon to Wilmington
- 223rd Street, Wilmington to Alameda
- West Wardlow from Alameda to I-710

The detailed MSAT analysis is available as Appendix N to the Air Quality Technical Study (Caltrans, 2008).

Since Alternative 3 would have the same traffic conditions as Alternative 1, and Alternative 4 would not affect the traffic conditions when compared to the No Build alternative, it was assumed that Alternatives 3 and 4 would have the same MSAT emissions as Alternatives 1 and 6, respectively. In addition, a traffic analysis was not performed for Alternative 5. Therefore, the MSAT analysis will only include a discussion of Alternatives 1, 2, and 6.

Results

The MSAT Tool was used to estimate the MSAT emissions presented in Table 3.13-9. As shown in Table 3.13-9, the MSAT emissions are predicted to significantly decrease over time, even though the traffic volumes and percentage of diesel trucks are expected to increase over time. The decrease in MSAT emissions for the alternatives analyzed is consistent with EPA projections that MSAT emissions will decrease over the next 15 years. However, the MSAT analysis shows a slight increase in diesel particulate matter emissions in the year 2030 when compared to the year 2015. This increase is due to aging of the truck fleet because it was assumed the Port trucks would have model year 2007 or newer engines. In the year 2015, a model year 2007 engine would only be 8 years old. However, by the year 2030, trucks with model year 2007 engines would have aged to 23 years old. The aging of the truck fleet results in the higher emission factors in 2030 compared to 2015.

In general, there would be minor differences in MSAT emissions between the build alternatives for each analysis year. However, MSAT emissions for the No Build alternative, Alternative 1, and Alternative 2 in the future years would be much lower when compared to the existing condition. The MSAT emissions in the years 2015 and 2030 would be less than or the same for Alternatives 1 and 2 when compared to the No Build alternative. MSAT emissions, excluding diesel particulate matter, would be predicted to decrease with time.

MSAT emissions were estimated by road segment and the summary of the MSAT emissions by segment are provided in Appendix N to the Air Quality Technical Study.

Table 3.13-9
Daily MSAT Emissions for the Project Study Area

		Emissions (lbs/day)					
Year	Scenario	Diesel PM	Benzene	1,3-Butadiene	Acetaldehyde	Acrolein	Formaldehyde
2003	**Existing Condition**	828	70	16	14	4	53
2015	**No Build (Alternative 6)**	95	12	3	2	1	10
	Alternative 1	94	12	3	2	1	10
	Alternative 2	91	12	3	2	1	10
2030	**No Build (Alternative 6)**	128	3	1	0.4	0.2	4
	Alternative 1	127	3	1	0.4	0.2	4
	Alternative 2	128	3	1	0.4	0.2	4

Limitations of MSAT Analysis

The following discussion regarding the limitations of the MSAT analysis is prototype language taken from the Interim Guidance, Appendix C. A detailed discussion of the limitations of analyzing MSAT emissions is provided in the Air Quality Technical Study (Caltrans, 2008).

Unavailable Information for Project-Specific MSAT Impact Analysis. This MSAT analysis includes a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable predicting the project-specific health impacts of the emission changes associated with the project alternatives. Due to these limitations, the following discussion is included in accordance with CEQ regulations (40 CFR 1502.22[b)]) regarding incomplete or unavailable information:

Information that Is Unavailable or Incomplete -- Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

- Emissions. The tools available from EPA and the California Air Resources Board to estimate MSAT emissions from motor vehicles are not sensitive to key variables that determine emissions of MSATs in the context of highway projects.
- Dispersion. The tools to predict how MSATs disperse are also limited. The current EPA and California regulatory models, such as CALINE3, CAL3QHC, and CALINE4, were developed and validated more than a decade ago for the purpose of predicting episodic concentrations of carbon monoxide to determine compliance with the NAAQS.

The performance of dispersion models is more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area. Along with these general limitations of dispersion models, FHWA is also faced with a lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.

- Exposure Levels and Health Effects. Finally, even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude the analysis from reaching meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis.

Summary of Existing Credible Scientific Evidence Relevant to Evaluating the Impacts of MSATs. Research into the health impacts of MSATs is ongoing. For different emission types, there are a variety of studies that show that some emission types either are statistically associated with adverse health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses.

There have been studies that address MSAT health impacts in proximity to roadways. The Health Effects Institute, a non-profit organization funded by EPA, FHWA, and industry, has undertaken a major series of studies to research near-roadway MSAT hot spots, the health implications of the entire mix of mobile source pollutants, and other topics. The final summary of the series is not expected for several years.

Some recent studies have reported that proximity to roadways is related to adverse health outcomes -- particularly respiratory problems. Much of this research is not specific to MSATs, instead surveying the full spectrum of both criteria and other pollutants. The FHWA cannot evaluate the validity of these studies, but more importantly, they do not provide information that would be useful to alleviate the uncertainties listed above and enable performing a more comprehensive evaluation of the health impacts specific to this project.

Relevance of Unavailable or Incomplete Information to Evaluating Reasonably Foreseeable Significant Adverse Impacts on the Environment, and Evaluation of Impacts Based upon Theoretical Approaches or Research Methods Generally Accepted in the Scientific Community. Because of the uncertainties outlined above, a quantitative assessment of the effects of air toxic emissions impacts on human health cannot be made at the project level. While available tools do allow reasonable predictions of relative emission changes between alternatives for larger projects, the amount of MSAT emissions from each of the proposed project alternatives and MSAT concentrations or exposures created by each of the project alternatives cannot be predicted with enough accuracy to be useful in estimating health impacts. (As noted above, the current emissions model is not capable of serving as a

meaningful emissions analysis tool for smaller projects.) Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have "significant adverse impacts on the human environment."

This MSAT analysis has provided a comparison of MSAT emissions relative to the various alternatives, and has acknowledged that, for the analysis years 2015 and 2030, MSAT emissions from Alternatives 1 and 2 would result in similar MSAT emissions when compared to the No Build alternative. Since the concentrations and duration of exposures are uncertain, the health effects from these emissions cannot be estimated.

3.13.3.4.3 Health Risk Assessment and Methodology

The previous section presented the MSAT emissions analysis for compliance with FHWA NEPA guidance. This section presents the HRA methodology, prepared per ACTA's instruction, to evaluate the health risk resulting from operation of the proposed project. The reasons for conducting an HRA for the proposed project are:

- Community members with commercial and residential land uses adjacent to the transportation corridor submitted comments on the draft EIS/EIR requesting that air toxic emissions associated with increased truck traffic be addressed.
- There are local HRA protocols for stationary sources and established SCAQMD thresholds for evaluating the significance of health risk. The methodology used in the HRA was modeled after these established protocols but recognizes the spatial differences inherent in transportation projects. ACTA has adopted these thresholds, but Caltrans has not adopted HRA thresholds and is not subject to local thresholds of significance.
- ACTA is a Responsible Agency under CEQA and will be implementing the expressway portion of the proposed project. This work will require Port Development Permits from the Port of Long Beach and Port of Los Angeles; ACTA will be required to submit an HRA in support of its application for the permits. CEQA documents prepared in support of recent Port development permits have all included quantitative HRAs.

The purpose of the HRA was to evaluate both the adverse impacts and benefits of the proposed project in terms of localized and regional health risk. The HRA considered the health risks of Alternative 1, 1A and Alternative 2 by comparison to Alternative 6 (No Build). Alternative 3 was assumed to be the same as Alternative 1, Alternative 4 was assumed to be the same as Alternative 6, and Alternative 5 was not evaluated.

The air dispersion modeling and HRA focused on a broad geographic area. The geographic area extends approximately 7.5 miles north of the Schuyler Heim Bridge and over 5 miles from the end of the actual improvements at Alameda Street and Pacific Coast Highway. The land uses surrounding the geographic area used in the HRA were also identified. Land use type is important for assessing the health risks along the roadways and for determining where mitigation measures may be needed.

The HRA focused on both incremental cancer and non-cancer acute and chronic health risk impacts from Port trucks, local South Coast Air Basin trucks, and cars. Cancer risks for residential, school, worker, and recreation receptors were evaluated using two emission

scenarios, which included one based on 70-year average emissions (year 2003 through 2072) and the other one based on 2015 emissions. Both scenarios evaluated the risks over a 70-year period for several categories of exposed receptors (residential, commercial/industrial workers, recreational workers and users, and school workers and students). The following HRA methodology sections present the emission estimates, emission scenarios, dispersion modeling, and risk assessment. The HRA report is included as an appendix to this document and provides a more detailed discussion of the methodology

3.13.3.4.3.1 Emission Estimation

Total organic gas (TOG) and diesel particulate matter emissions, on existing and future roadways were estimated using approved emission factors models, such as EMFAC2007. In order to estimate air toxic emissions, the constituents of the total organic gas (TOG) and particulate matter (PM) were identified using ARB profiles.

Emissions were estimated for the existing conditions (year 2003), year open to traffic (2015), and the horizon year of 2030. Port trucks were assumed to be 100 percent heavy-heavy Duty (HHD) trucks. For existing conditions (2003) and until the year 2007, it was assumed that all of the HHD Port trucks would be diesel-fueled. After 2007, it was assumed that Port trucks would begin to be replaced due to the implementation of the Ports Clean Air Action Plan (CAAP), specifically, the Port Clean Truck Program. Specific commitments of the CAAP were incorporated into the Port truck fleet profiles to capture these important improvements in the project build-out years of 2015 and 2030 (personal communication, Chris Patton, Port of Los Angeles). The CAAP emission reductions were not discounted in terms of effectiveness for two reasons: 1) all measures are supported by firm commitments on behalf of both ports[1]; and 2) the SCAQMD is currently collaborating with the ports on a rulemaking process for "backup" measures should these programs fall short of their goals[2].

In addition to the Ports' Clean Truck Program assumptions, the non-Port medium-heavy duty (MHD) and HHD truck fleet was assumed to be in compliance with the ARB "On-Road Heavy Duty Diesel Vehicles Regulation" which is anticipated to be approved in December of 2008. Under this regulation, both MHD and HHD trucks would have to meet emission standards for model year 2003 engines or better by 2015, and model year 2007 or better by 2017.

In 2015, for both Port and non-Port trucks, the diesel truck emissions factors for DPM were assumed to be reduced by an additional 10 percent to account for two AB 32 discrete early action measures, the low carbon fuel standard (LCFS) and the Heavy-Duty Vehicle Greenhouse Gas Reduction Measure (similar to EPA's SmartWay truck fuel efficiency program). These discrete early action measures are scheduled to be adopted by ARB and enforceable by 2010. A 10 percent reduction of DPM emissions represents the lower limit of the reduction targets under these measures; therefore, this reduction was considered conservative.

In 2030, for both Port and non-Port trucks, the diesel truck emissions factors for DPM were assumed to be reduced by an additional 35 percent. This reduction would come from a combination of the LCFS, increased fuel efficiency, and vehicle hybridization strategies

[1] May 15th 2007, Los Angeles Board of Harbor Commissioners, Clean Truck Program Concession Agreement

[2] San Pedro Bay CAAP, FAQs, http://www.polb.com/faqs

outlined in ARB's proposed scoping plan for AB 32. The 35 percent reduction was based on the assumption that 100 percent of the remaining diesel trucks would use biodiesel or an equivalent alternative fuel. Biodiesel produces approximately 35 percent less particulate matter emissions than diesel fuel. The particulate matter emitted from biodiesel combustion is less carcinogenic than the particulate matter resulting from combustion of diesel fuel. Biodiesel was used as a worst-case assumption to account for implementation of the AB 32 alternative fuels program. The alternative fuel provisions of AB 32 would likely result in a variety of fuel types with a higher percentage reduction in DPM than biodiesel.

Emissions were estimated for both maximum hourly and annual average emissions. Maximum hourly emissions were estimated using peak hour traffic projections from the traffic study for each roadway segment. The traffic study used three peak hour periods; AM, midday (MD), and PM. The peak midday (MD) hour was used for both regional traffic and Port trucks since this hour had the highest truck volumes. The PM peak hour was used for automobiles since this hour had the highest automobile traffic volumes. This approach was considered conservative because the maximum short-term traffic impacts would be evaluated in the HRA. Annual average emission rates were developed for project years 2003, 2015, and 2030 based on average daily traffic (ADT) for the proposed project and regional roadways. The Port of Long Beach/Port of Los Angeles transportation model (see Meyer Mohaddes Traffic Study [ACET, 2007]) was utilized to develop the traffic data used in the analysis.

3.13.3.4.3.2 Emission Scenarios

Emission scenarios were developed for the acute, chronic, and cancer risk analysis. For the acute and chronic risk analysis, maximum hourly and annual average emissions were estimated for each of the proposed project years of 2003, 2015, and 2030. For the cancer risk analysis, two emission scenarios were included in the HRA, one based on 70-year average emissions and the other one based on 2015 emissions.

70-Year Average Emissions Scenario

For the purpose of the cancer risk analysis, the exposure period was assumed to be the 70-year period of 2003 through 2072. The 70-year average emissions were derived by linearly interpolating between years 2003 to 2015 and from 2015 to 2030. After 2030, emissions were assumed to be constant at 2030 levels. The 70-year long term average emissions are composed of 12 years of no net increase in project emissions (because the project will not be in place until 2015), 15 years of reasonably foreseeable incremental project emissions (2016 though 2030), and 43 years of estimated incremental project emissions at 2030 levels (2031 though 2072). Additional details for the 70-year average emission rates are included in the HRA.

The 70-year average emissions scenario may overestimate cancer risk due to the conservative assumptions used in the analysis. The analysis used traffic projections and reasonably anticipated regulatory programs up to the year 2030. Beyond 2030 project emissions were estimated and may not (1) be reflective of the economic conditions of the time, (2) realize future technological advances or (3) account for promulgation of additional regulations for diesel risk or greenhouse gas emissions reduction purposes.

2015 Emissions Scenario

The 2015 emissions scenario was used to address uncertainties related to future year emissions (e.g. emissions beyond 2015). The 2015 emissions scenario evaluated cancer risks over a 70-year period but only incorporated known parameters. The 2015 emissions scenario relies on reasonably foreseeable traffic estimates and includes regulations or programs either currently required or those with expected dates of adoption (e.g., Ports' Clean Truck Program and ARB's On-Road Heavy Duty Diesel Vehicles Regulation, which is set for adoption by the Board in December of 2008).

Recommendation of the Preferred Emission Scenario

The 2015 emission scenario is recommended as the preferred emissions scenario. This scenario was used to evaluate project significance and mitigation because it is based on reasonable foreseeable conditions (adopted already or soon to be adopted regulations). The 2015 emission scenario avoids the speculation of the 70-year analysis, which assumes that significant growth in imports and truck traffic would occur without advances in emission control technology past 2020. Potential health risk may be over-predicted using the 70-year average emissions scenario and it may be unnecessary to implement mitigation beyond what would be necessary in 2015. Factors that contribute to over-prediction of potential risks in the 70-year scenario include:

- *Potentially unrealistic growth assumptions.* The analysis assumed growth in Port operations, consistent with recent environmental evaluations (to 44 million TEUs [twenty-foot equivalent unit] in 2020). The Ports' estimated terminal capacity of 42.5 million TEUs is based on the assumption that considerable additional acres of land can be developed for Port purposes. Absent that, a more realistic estimate is under 36 million TEUs, substantially less than what was used in this analysis to predict increases. Many factors can affect growth projections including the current economic downtrend, which may lead to reduced demand for imported goods, and recently imposed fees that may make importation through the San Pedro ports less economically attractive in the future. If growth in imports is less than projected, or diversion of cargo to other more economically advantageous ports occurs, truck emissions would be lower than projected and health risks would decrease accordingly. Other ports positioned to compete with the Los Angeles and Long Beach ports are located on the Gulf and East Coasts via the Panama Canal and Suez Canal, as well as West Canadian and Mexican ports. Potential loss of market share at the Port Los Angeles or Port of Long Beach would significantly reduce the Port-related traffic on SR-47 beyond 2015.

- *Lack of future regulations.* The 70-year analysis assumes that while traffic continues to increase, no regulations would be adopted to reduce truck emissions other than those currently adopted or proposed for adoption. Thus, for over 50 years (2020-2073) emissions are projected to grow due to increased traffic but no emissions reductions are assumed due to new regulations. The clear trend in air pollution control is for increasingly stringent vehicle emission and vehicle fuel standards to be adopted by ARB and the Federal EPA every 5 to 7 years. During the last ten years, regulations have been promulgated that reduce NO_X and PM by 35 percent; in the next few years EPA expects to reduce diesel PM by 94 percent. Therefore, the assumption that no additional regulations would be adopted is highly unrealistic given the history of vehicle emission

regulations in California. In fact, it is highly likely that a series of additional regulatory programs would be implemented during the 70-year period evaluated in the HRA.

- The analysis incorporated the fact that the Ports of Long Beach and Los Angeles have committed to a truck retrofit program, as well as an LNG hybrid retrofit program through 2012. The analysis has assumed significant deterioration of the fleet from 2015 to 2030 (10 to 15 percent) due to aging. The Port's Clean Trucks Program will lead to more rapid fleet turnover than in the past due to the issuance of Port concessions, more trucking by larger companies with the capital to replace trucks more often, and a reduction in independent operators due to more stringent Port requirements and competition. ARB's proposed on-road heavy duty truck regulation, scheduled for adoption in late 2008, will also accelerate fleet turnover. A more rapid fleet turnover rate may limit this deterioration in emission rates.
- *New motor vehicle fuels.* A more diversified approach to alternate fuels (beyond biodiesel) may result in substantially greater DPM emission reductions.
- *New goods movement technologies.* The ports are also investigating electric trucks and other zero-emissions container movement systems and, if implemented, would eliminate existing sources of diesel emissions.

The expected scenario is that advanced emission control technologies, fleet turnover higher than in the past, and innovations in goods movement technologies would maintain or improve the overall truck emissions profile at or near 2015 levels (or lower). For these reasons, the 2015 emissions scenario is recommended as a more realistic estimate of health risk associated with the proposed project than the 70-year emission scenario.

3.13.3.4.3.3 Air Dispersion Modeling

The air dispersion modeling was performed using the EPA preferred regulatory air dispersion model AERMOD with 12 consecutive months of meteorological data from September 2006 through August 2007. The meteorological data was collected at the St. Peter and Paul School by SCAQMD, and was pre-processed for AERMOD by the Port of Los Angeles using the latest EPA guidance. The St. Peter and Paul School dataset was selected for its proximity to the proposed project area as well as its acceptability for use in similar regional modeling efforts inland of Port operations.

The roadways used in the air dispersion modeling included existing roadways as well as new alignments to be constructed as part of the proposed project. Volume source representations of the roadways were developed based on roadway configurations. Receptors were positioned on two main receptor grids, a coarse grid and a refined grid, covering the approximate 9-km x 14-km region surrounding the proposed project area. The area covered by the grids was defined based on proximity to roadways and the land use type along the alignment. The coarse grid was used to identify regional effects of the proposed project. The refined grid was used to identify areas of localized health effects on schools, parks, and residential neighborhoods. Sensitive land use areas were identified based on 2001 SCAG land use data for residential, primary and secondary schools, parks, and marinas.

3.13.3.4.3.4 Risk Assessment:

The HRA was performed following the latest guidance outlined in the "*Air Toxics Hot Spots Program Risk Assessment Guidelines*" (Office of Environmental Health Hazard Assessment (OEHHA), August 2003). The ARB Hotspots Analysis and Reporting Program (HARP), Version 1.4a, along with the HARP On-Ramp program (Version 1.0), was used for HRA modeling. The HARP Risk Module predicts health impacts in terms of cancer risk, acute hazard index (HIA), and chronic hazard index (HIC).

Since inhalation is the dominant pathway of cancer risks, the Derived (Adjusted) Method in HARP was used for the cancer risk evaluation based on Recommended Interim Risk Management Policy for Inhalation-Based Residential Cancer Risk (ARB, 2003). Cancer risks for worker, student, and recreational user receptors were based on the ratio of the breathing rates and exposure durations to the resident receptors. The details of the worker, student, and recreation cancer risk assumptions are presented in the HRA report.

Cancer Risks Approach. Cancer risk from diesel trucks was evaluated by quantifying emissions of diesel exhaust particulate matter. Cancer risk from gasoline-fueled cars and trucks was evaluated by identifying the organic exhaust stream constituents (acetaldehyde, benzene, 1,3-butadiene, and formaldehyde). Cancer risk contributed from LNG trucks was evaluated using combustion of diesel fuel component as DPM, the total organic gas (TOG) components of the LNG exhaust, and PM from LNG combustion.

Non-Cancer Risks Approach. Chronic health effects were calculated based on annual average emissions for the individual project year producing the maximum chronic impact (year 2030). Chronic impacts from diesel trucks were evaluated using diesel exhaust particulate matter. Chronic health effects from components of gasoline exhaust were evaluated for acetaldehyde, acrolein, benzene, 1,3-butadiene, and formaldehyde. Chronic health effects from LNG exhaust were evaluated using combustion of diesel fuel component as DPM, the TOG components of LNG exhaust, and PM from LNG combustion.

Acute health effects were calculated based on maximum peak hour emissions for the individual project year producing the maximum acute impact (year 2015). Acute impacts from diesel truck emissions were evaluated by identifying the constituents of both the organic and particulate component of the diesel exhaust. This was done because OEHHA has not established an acute reference exposure levels (REL) for diesel exhaust. Acute health effects from components of gasoline exhaust were evaluated using OEHHA established acute RELs for acrolein, benzene, and formaldehyde. Acute health effects for the LNG exhaust were evaluated by identifying the components of the DPM exhaust as well as TOG and PM from LNG combustion.

3.13.3.4.4 Construction Emissions

Construction equipment and vehicle emission factors of CO, NO_X, ROG, SO_X, and PM_{10} used in construction emission calculations were obtained from information available in the *CEQA Air Quality Handbook* (SCAQMD, 1993 and 2006), EMFAC2007 emissions model, and the EPA *Compilation of Air Pollutant Emission Factors* (AP-42). Summaries of the emissions factors and their sources are contained in the Air Quality Technical Report (Caltrans, 2008). Because there are currently few or no $PM_{2.5}$ emission factors for combustion processes, the $PM_{2.5}$ emissions were calculated following the methodology recommended by SCAQMD and using the $PM_{2.5}$ fraction of PM_{10} (SCAQMD, 2006). Emission factors for PM_{10} from the

CEQA Air Quality Handbook, EMFAC2007 emissions model, and the EPA *Compilation of Air Pollutant Emission Factors* (AP-42) were used in the calculation of fugitive dust emissions. Fugitive dust emissions were separated into two categories; exposed areas and unpaved roads. Exposed areas were assumed to be graded areas, excavated areas, and stockpiles. The reported fugitive dust emissions include a 68 percent control efficiency achieved by watering the exposed areas three times a day. The reported fugitive dust emissions from unpaved roads include a 45 percent control efficiency achieved by watering the unpaved roads three times a day. These control efficiencies are based on the information contained in Table 11-4 of the CEQA Handbook. It was conservatively assumed that the $PM_{2.5}$ emissions would be the same as the PM_{10} emissions.

3.13.3.5 Evaluation of Alternatives (Criteria Pollutant Impacts)

This section provides the environmental analysis of construction and operations by alternative. Project transportation conformity is discussed under Section 3.13.3.4.1. Health risk impacts discussions are presented in Section 3.13.3.6.

3.13.3.5.1 Alternatives 1 and 1A: Bridge Replacement and SR-47 Expressway

3.13.3.5.1.1 Construction Effects

Construction activities would involve demolition of the existing Schuyler Heim Bridge and construction of the replacement bridge, Ocean Boulevard/SR-47 Flyover (flyover), and SR-47 Expressway. Two construction methodologies were considered for Alternative 1: CIP and segmental. Detailed construction equipment lists for Alternative 1 are available in the Air Quality Technical Study (Caltrans, 2008).

During demolition, materials present in the existing Schuyler Heim Bridge may be released into the atmosphere. According to the Initial Site Assessment (Caltrans, 2005b), the Schuyler Heim Bridge was evaluated for the presence of asbestos-containing materials (ACM) and lead-based paint (LBP). Based on the type and condition of the Schuyler Heim Bridge, ACM and LBP likely are present and considered recognized environmental conditions (RECs). It has been recommended that a predemolition survey of the Schuyler Heim Bridge be conducted for ACM and LBP. The purpose of the survey would be to determine the presence of regulated and/or potentially hazardous construction materials on the bridge. If ACM is determined to be present, it will be removed prior to demolition, in accordance with SCAQMD Rule 1403 and EPA's National Emissions Standards for Hazardous Air Pollutants (NESHAP).

Another pollutant of potential concern in assessing air quality impacts associated with construction activities is naturally occurring asbestos. Asbestos is a toxic air contaminant that is regulated under the Asbestos Airborne Toxic Control Measure (ATCM), which was adopted by the ARB in 1990 and amended in 2000. The ATCM states that allowable asbestos content in surfacing materials must be less than 0.25 percent, effective spring 2001. In addition to surfacing materials, asbestos may occur naturally in serpentinite and ultramafic rock and can be released when the rock is broken or crushed.

According to the Department of Conservation, Division of Mines and Geology, the project is located in a county that does contain serpentinite or ultramafic rock. However, any serpentinite or ultramafic rock found in Los Angeles County is restricted to the Catalina Islands. The surficial geology of the Long Beach area is composed of quaternary alluvial material that consists of sands, gravels, silts, and clays and not ultramafic or serpentinite

material (Cal. DWP, 1961). Therefore, fugitive asbestos from naturally occurring materials would not be emitted in significant quantities during construction or operation of Alternatives 1 and 1A. Surfacing materials also would not contain more than 0.25 percent asbestos; therefore, Alternatives 1 and 1A would not have an adverse effect on air quality from emissions of asbestos.

Direct

Criteria Pollutants

Direct construction emissions include emissions from equipment that would be used during site preparation and project construction to perform activities such as clearing, grading, excavating, and demolishing existing structures. These activities would involve the use of diesel- and gasoline-powered equipment that would generate emissions of criteria pollutants such as CO, NO_X, ROG, SO_X, PM_{10}, and $PM_{2.5}$. Emissions of NO_X and ROG would contribute to the formation of ozone, and NO_X would also contribute to the formation of $PM_{2.5}$. Direct emissions from Alternative 1 construction are shown in Table 3.13-10. The construction emissions of CO, NO_X, ROG, PM_{10}, and $PM_{2.5}$ would exceed the SCAQMD thresholds. In addition, since the project is located in Los Angeles County, which has been federally designated nonattainment status for ozone, $PM_{2.5}$, and PM_{10}, the construction emissions associated with Alternative 1 would have an adverse but temporary effect on air quality.

As described above, construction emissions of CO, ROG, SO_X, NO_X, PM_{10}, and $PM_{2.5}$ would be expected to have adverse but temporary effects on air quality. The proposed action would be required to comply with control measures specified in SCAQMD Rule 403, Table 1, and in Rule 1186. Construction activities will also be subject to compliance with Caltrans Standard Construction Specifications. In addition, mitigation measures would be implemented to further reduce air quality effects during project construction.

Sensitive Receptors

Construction activities may expose sensitive receptors in the vicinity to short-term elevated diesel PM_{10} levels. However, the PM_{10} concentrations would be considered less than substantial because the risk posed by diesel PM_{10} is based on long-term exposure. Therefore, sensitive receptors would not be exposed to substantial pollutant concentrations during construction of the project alternatives. The CO concentrations at the intersections shown in Tables 3.13-6 and 3.13-7 are less than the air quality standards; therefore, sensitive receptors would not be exposed to substantial pollutant concentrations during operation.

Odors

During project construction, objectionable odors likely would occur related to operation of diesel-powered equipment and to road-building activities, such as paving and asphalting. Objectionable odors may occur as a result of construction in marine sediments for demolition of the existing Schuyler Heim Bridge and construction of the new bridge, as well as drilling and augering activities on land for the support piers for both the bridge and flyover. These subsurface activities may encounter contaminated sediments and/or soils that would release VOCs and release objectionable odors to the atmosphere. Such odors, however, would be short-term and limited to the area where the specific activity is occurring. Odors would cease once the subsurface construction activity ceases. The perception of these odors is dependent upon climatic conditions such as temperature, humidity, wind speed, and wind direction.

Table 3.13-10

Alternative 1/Alternative 1A Maximum Direct Construction Emissions with Mitigation to Control Fugitive Dust

	Cast-in-Place Method Emissions						Segmental Method Emissions					
	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Maximum Construction Equipment Exhaust	831	1761	206	1.8	85	77	764	1546	194	1.7	78	71
Maximum Workers Commute	73	7.6	7.5	0.08	0.65	0.41	67	7	6.9	0.07	0.6	0.35
Maximum Fugitive Dust	NA	NA	NA	NA	903	191	NA	NA	NA	NA	716	152
Combined Maximum Daily Emissions	**905**	**1769**	**214**	**1.9**	**988**	**269**	**831**	**1553**	**201**	**1.7**	**795**	**223**
SCAQMD Thresholds (lb/day)	**550**	**100**	**75**	**150**	**150**	**55**	**550**	**100**	**75**	**150**	**150**	**55**

Note:

1. According to SCAQMD *CEQA Air Quality Handbook* Table 11-4, the control efficiencies of the fugitive dust from construction sites and unpaved roads were assumed to be 68 percent and 45 percent, respectively, by watering the sites or unpaved roads three times a day. The PM_{10} emissions listed in the table have taken into account the above control efficiencies.

Construction will be conducted in compliance with SCAQMD Rule 1166, which limits VOC emissions. In addition, construction activities will be located within fenced, secured sites as far from receptors as feasible, with no public access. Due to the relatively short-term nature of construction odors, controlled access, and the distance to the nearest receptors, odors are not likely to affect a substantial number of people.

Indirect

As a result of the closures and restrictions to marine vessel traffic, ships that cannot pass would need to take a longer route outside the Cerritos Channel. The increased trip time of these ships would result in increased emissions of criteria pollutants and would cause an indirect effect to the ambient air quality during project construction.

Worst-case daily emissions from the marine vessel detour were calculated for the days when the channel is closed completely. The maximum number of hours per day marine vessels would spend in detour during the Schuyler Heim Bridge construction were estimated using the data provided in *Draft Schuyler Heim Bridge Replacement and SR-47 Expressway Project: Long Term Economic Impacts to Marine Vessel Operation in the Cerritos Channel* (Caltrans, 2005a). $PM_{2.5}$ emissions were calculated following the methodology recommended by SCAQMD and using the $PM_{2.5}$ fraction of PM_{10} (SCAQMD, 2006). The detoured ships primarily would be non-ocean-going ships, such as tugboats, fishing boats, yachts, and harbor operations vessels. It was assumed that ships would be slow, cruising 50 percent of the time and maneuvering the rest of the time during the detour.

The daily hours for detour were estimated based on the full closure of the channel, and thus are the same for both construction methods, CIP and segmental. The majority of the marine vessel emissions would be from tugboats. Maximum daily indirect marine vessel emissions of NO_X, ROG, CO, SO_X, PM_{10}, and $PM_{2.5}$ during construction are shown in Table 3.13-11.

The sum of direct and indirect emissions from construction associated with Alternative 1 would have an adverse but temporary effect on air quality. Mitigation will be implemented.

Table 3.13-11
Maximum Daily Marine Vessel Detour Emissions During Schuyler Heim Bridge Construction

Ship Type	Worst-case Daily Detour Hours During Construction (hours/day)	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Tugs	4.95	29.1	117.0	4.4	0.079	3.1	2.81
Harbor Operations	0.11	0.75	3.0	0.11	0.0020	0.079	0.072
Fishing	0.02	0.037	0.15	0.0055	0.00010	0.0038	0.0035
Yachts	1.07	2.7	11.0	0.42	0.0074	0.29	0.26
Tankers	0.02	0.43	1.6	0.067	0.0011	0.042	0.039
Total	NA	33.1	132.8	5.0	0.09	**3.5**	3.2

3.13.3.5.1.2 Operations Effects

Direct

Criteria Pollutants

The SR-47/SHB project is listed in the conforming 2008 RTP and the 2008 RTIP that was approved by SCAG in July 2008; therefore, the project would have satisfied the conformity requirements as required by the regional plan and program. In addition, localized CO, PM_{10}, and $PM_{2.5}$ emissions associated with operation of Alternative 1 were evaluated. The CO emissions shown in Table 3.13-6 and 3.13-7 for Alternative 1 are less than the federal standards shown in Table 3.13-1. The qualitative PM hot spot analysis is discussed in Section 3.13.3.4.1.3. Localized PM_{10}/PM_{25} demonstrated that the project would not contribute to or exacerbate exceedances of the PM_{10} or $PM_{2.5}$ standards. Therefore, no permanent direct air quality effects would be expected under Alternative 1.

Odors

Objectionable odors from project operations would be consistent with odors produced by existing bridge and road uses, primarily vehicle exhaust and diesel emissions. The perception of these odors is dependent upon climatic conditions such as temperature, humidity, wind speed, and wind direction. The perception of odors resulting from project operations would be reduced to the extent that vehicular traffic along the SR-47 Expressway would be elevated and would be above the level of sensitive receptors, where odors would be dispersed. No additional sources of odor would be expected.

Indirect

Replacement of the existing Schuyler Heim Bridge with a fixed-span bridge would have indirect effects on local air quality by affecting the marine traffic. Replacing the lift-span bridge with the lower fixed-span bridge would force taller marine vessels to take a longer route around Terminal Island and would delay vessels with adjustable mast heights. The increased trip times for the marine vessels would result in increased emissions of criteria pollutants. Emissions of CO, NO_X, ROG, SO_X, and PM_{10} resulting from marine vessel detours and delays in 2011 and 2030 were calculated using the *Analysis of Commercial Marine Vessels Emissions and Fuel Consumption Data* (EPA, 2000) in conjunction with forecasted delay and detour travel times (Caltrans, 2005a). $PM_{2.5}$ emissions were calculated following the methodology recommended by SCAQMD and using the $PM_{2.5}$ fraction of PM_{10} (SCAQMD, 2006). The detour hours during operation of the Schuyler Heim Bridge in 2011 are the same as in 2030, based on the assumption that the marine traffic would not increase in future years (Caltrans, 2005a).

Daily emissions resulting from marine vessel detours during operation of the proposed fixed-span Schuyler Heim Bridge, as well as the comparisons with SCAQMD operational emission thresholds are presented in Table 3.13-12. These emissions would be the same for Alternatives 1, 1A, 2, 3, and 4. Project operations would result in a net increase in NO_X emissions greater than the SCAQMD operation threshold for NO_X. However, this emissions increase would be offset by the emissions reductions achieved by the truck buyback program implemented during project construction. The amount of NO_X emissions offset would be up to 133 lb/day (24.2 ton/year) at the beginning of project operation, and may gradually decrease over future years as the entire truck fleet becomes newer and cleaner.

Table 3.13-12
Indirect Daily Operational Emissions from Marine Vessels

Ship Type	Worst-Case Daily Detour Hours During Operation (hours/day)	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_2 (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Tugs	3.53	20.77	83.52	3.16	0.06	2.18	2.00
Harbor Operations	0.08	0.54	2.15	0.08	0.0015	0.06	0.05
Fishing	0.02	0.03	0.10	0.004	0.0001	0.003	0.003
Yachts	0.76	1.95	7.85	0.30	0.0053	0.20	0.19
Tankers	0.02	0.31	1.14	0.05	0.0008	0.03	0.03
Total		**23.6**	**94.8**	**3.59**	**0.06**	**2.47**	**2.27**
SCAQMD Thresholds		**550**	**55**	**55**	**150**	**150**	**55**

Summary

Table 3.13-13 presents the total peak daily emissions from direct (see Table 3.13-4) and indirect (see Table 3.13-12) operation emissions. Implementation of Alternative 1 in 2011, 2015, or 2030 would result in a net decrease in emissions when compared to the existing conditions. Therefore, mitigation would not be required for project operation.

Table 3.13-13
Peak Daily Emissions for the Project Study Area
(Sum of Direct and Indirect Emissions)

Year	Alternative	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
2003	Existing Conditions	54,560	26,620	2,893	207	1,131	901
2011	No Build	24,568	18,233	1,421	52	878	671
	Alternative 1	24,423	18,084	1,406	52	873	667
	Alternative 2	24,659	17,029	1,368	51	838	634
	Alternative 3	24,423	18,084	1,406	52	873	667
	Alternative 4	24,568	18,233	1,421	52	878	671
2015	No Build	19,185	13,209	1,100	57	786	579
	Alternative 1	19,012	13,062	1,083	57	781	576
	Alternative 2	19,212	13,260	1,097	57	791	584
	Alternative 3	19,012	13,062	1,083	57	781	576
	Alternative 4	19,185	13,209	1,100	57	786	579
2030	No Build	11,177	5,997	708	72	631	457
	Alternative 1	10,894	5,799	668	72	627	443
	Alternative 2	10,984	5,865	675	72	633	447
	Alternative 3	10,894	5,799	668	72	627	443
	Alternative 4	11,177	5,997	708	72	631	457

3.13.3.5.2 Alternative 2: SR-103 Extension to Alameda Street

3.13.3.5.2.1 Construction Effects

Construction activities would involve demolition of the existing Schuyler Heim Bridge, plus construction of the replacement bridge, flyover, and SR-103 Extension. Two construction methodologies were considered for Alternative 2: CIP and segmental. Detailed construction equipment lists for Alternative 2 are available in the Air Quality Technical Study (Caltrans, 2008).

Direct

Direct emissions from Alternative 2 construction are shown in Table 3.13-14. The construction emissions of CO, NO_X, ROG, PM_{10}, and $PM_{2.5}$ would exceed the SCAQMD thresholds. In addition, since the project is located in Los Angeles, which has been federally designated nonattainment status for CO, ozone, PM_{10}, and $PM_{2.5}$, the direct construction emissions associated with Alternative 2 would have adverse but temporary effects on air quality.

Indirect

Under Alternative 2, the bridge construction would be the same as under Alternative 1. Also, marine vessel traffic restrictions would be the same as under Alternative 1. Therefore, effects from marine vessel detour emissions during construction of the Schuyler Heim Bridge (Tables 3.13-11) would be the same as those described for Alternative 1.

The sum of direct and indirect emissions from construction associated with Alternative 2 would have an adverse but temporary effect on air quality.

3.13.3.5.2.2 Operations Effects

Under Alternative 2, direct and indirect operations effects would be the same as those described for Alternative 1.

3.13.3.5.2.3 Construction Effects

The existing bridge would not be demolished under this alternative so there would be no construction effects associated with emissions from bridge demolition. Construction activities would involve construction of the replacement bridge, flyover, and the SR-47 Expressway. Two construction methodologies were considered for Alternative 3: CIP and segmental. Detailed construction equipment lists for Alternative 3 are available in the Air Quality Technical Study (Caltrans, 2008).

Direct

Direct construction emissions from Alternative 3 construction are shown in Table 3.13-15. The construction emissions of CO, NO_X, ROG, PM_{10}, and $PM_{2.5}$ would exceed the SCAQMD thresholds. In addition, since the project is located in Los Angeles County, which has been federally designated nonattainment status for CO, ozone, PM_{10}, and $PM_{2.5}$, the construction emissions associated with Alternative 3 would have adverse but temporary effects on air quality.

Table 3.13-14
Alternative 2 Maximum Direct Construction Emissions with Mitigation to Control Fugitive Dust

	Cast-in-Place Method Emissions						Segmental Method Emissions					
	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Maximum Construction Equipment Exhaust	822	1736	204	2	83	76	777	1619	193	2	76	69
Maximum Workers Commute	75	7.8	7.7	0.08	0.67	0.42	68	7.1	7	0.08	0.61	0.38
Maximum Fugitive Dust	NA	NA	NA	NA	904	191	NA	NA	NA	NA	717	152
Combined Maximum Daily Emissions	**897**	**1744**	**211**	**1.9**	**988**	**268**	**846**	**1626**	**200**	**1.9**	**794**	**222**
SCAQMD Thresholds (lb/day)	**550**	**100**	**75**	**150**	**150**	**55**	**550**	**100**	**75**	**150**	**150**	**55**

Note:

1. According to SCAQMD *CEQA Air Quality Handbook* Table 11-4, the control efficiencies of the fugitive dust from construction sites and unpaved roads were assumed to be 68 percent and 45 percent, respectively, by watering the sites or unpaved roads three times a day. The PM_{10} emissions listed in the table have taken into account the above control efficiencies.

Table 3.13-15
Alternative 3 Maximum Direct Construction Emissions with Mitigation to Control Fugitive Dust

	Cast-in-Place Method Emissions						Segmental Method Emissions					
	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Maximum Construction Equipment Exhaust	814	1745	203	1.8	83	76	755	1528	192	1.6	77	70
Maximum Workers Commute	75	7.8	7.7	0.08	0.67	0.42	69	7.2	7.1	0.08	0.62	0.39
Maximum Fugitive Dust	NA	NA	NA	NA	893	189	NA	NA	NA	NA	706	150
Combined Maximum Daily Emissions	**889**	**1753**	**211**	**1.9**	**976**	**265**	**824**	**1535**	**199**	**1.7**	**784**	**220**
SCAQMD Thresholds (lb/day)	**550**	**100**	**75**	**150**	**150**	**55**	**550**	**100**	**75**	**150**	**150**	**55**

Note:

1. According to SCAQMD *CEQA Air Quality Handbook* Table 11-4, the control efficiencies of the fugitive dust from construction sites and unpaved roads were assumed to be 68 percent and 45 percent, respectively, by watering the sites or unpaved roads three times a day. The PM_{10} emissions listed in the table have taken into account the above control efficiencies.

3.13.3.5.3 Alternative 3: Bridge Demolition Avoidance

Indirect

Under Alternative 3, the bridge construction would be comparable to Alternative 1. Also, marine vessel traffic restrictions would be the same as under Alternative 1. Therefore, effects from marine vessel detour emissions during construction of the Schuyler Heim Bridge (Tables 3.13-11) would be the same as those described for Alternative 1.

The sum of direct and indirect emissions from construction associated with Alternative 3 would have an adverse but temporary effect on air quality.

3.13.3.5.3.1 Operations Effects

Under Alternative 3, direct and indirect operations effects would be the same as those described for Alternative 1.

3.13.3.5.4 Alternative 4: Bridge Replacement Only

3.13.3.5.4.1 Construction Effects

Construction activities would involve demolition of the existing bridge and construction of the replacement bridge. Two construction methodologies were considered for Alternative 4: CIP and segmental. Detailed construction equipment lists for Alternative 4 are available in the Air Quality Technical Study (Caltrans, 2008).

Direct

Direct construction emissions from Alternative 4 construction are shown in Table 3.13-16. The construction emissions of NO_X, ROG, PM_{10}, and $PM_{2.5}$ would exceed the SCAQMD thresholds. In addition, since the project is located in Los Angeles County, which has been federally designated nonattainment status for CO, ozone, PM_{10}, and $PM_{2.5}$, the construction emissions associated with Alternative 4 would have adverse but temporary effects on air quality.

Indirect

Under Alternative 4, the bridge construction would be the same as under Alternative 1. Also, marine vessel traffic restrictions would be the same as under Alternative 1. Therefore, effects from marine vessel detour emissions during construction of the Schuyler Heim Bridge (Tables 3.13-11) would be the same as those described for Alternative 1.

The sum of direct and indirect emissions from construction associated with Alternative 4 would have an adverse but temporary effect on air quality.

3.13.3.5.4.2 Operations Effects

Under Alternative 4, direct and indirect operations effects would be the same as those described with operation of the new bridge under Alternative 1.

3.13.3.5.5 Alternative 5: Transportation System Management

3.13.3.5.5.1 Construction Effects

There would be minimal construction under the TSM alternative. Therefore, there would be no direct or indirect construction effects to air quality.

Table 3.13-16
Alternative 4 Maximum Direct Construction Emissions with Mitigation to Control Fugitive Dust

	Cast-in-Place Method Emissions						Segmental Method Emissions					
	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Maximum Construction Equipment Exhaust	503	1091	121	1	50	236	445	901	111	1	45	41
Maximum Workers Commute	41	4.3	4.2	0.05	0.37	0.23	35	3.7	3.6	0.04	0.3	0.2
Maximum Fugitive Dust	NA	NA	NA	NA	635	134	NA	NA	NA	NA	448	95
Combined Maximum Daily Emissions	**544**	**1095**	**125**	**1.1**	**685**	**180**	**480**	**905**	**115**	**1**	**493**	**136**
SCAQMD Thresholds (lb/day)	**550**	**100**	**75**	**150**	**150**	**55**	**550**	**100**	**75**	**150**	**150**	**55**

Note:

1. According to SCAQMD *CEQA Air Quality Handbook* Table 11-4, the control efficiencies of the fugitive dust from construction sites and unpaved roads were assumed to be 68 percent and 45 percent, respectively, by watering the sites or unpaved roads three times a day. The PM_{10} emissions listed in the table have taken into account the above control efficiencies.

3.13.3.5.5.2 Operations Effects

Direct

Components of the TSM alternative would improve traffic flow and reduce delays which would be expected to reduce vehicle emissions. Therefore, there would be no direct effect to air quality under the TSM alternative.

Indirect

Under the TSM alternative, Schuyler Heim Bridge would not be replaced, so marine vessels would not be required to detour around Terminal Island. Therefore, there would be no indirect effect to air quality under the TSM alternative.

3.13.3.5.6 Alternative 6: No Build

Under Alternative 6, there would be no change to the existing Schuyler Heim Bridge or to the local roadway system.

3.13.3.5.6.1 Construction Effects

There would be no construction activities under the No Build alternative. Therefore, there would be no direct or indirect construction effects to air quality.

3.13.3.5.6.2 Operations Effects

Direct

The CO concentrations shown in Table 3.13-6 and 3.13-7 for No Build alternative are less than the federal standards shown in Table 3.13-1. The qualitative PM_{10} analysis is discussed in Section 3.13.3.4.1.3. Localized PM_{10}/PM_{25} showed that the project would be unlikely to cause new violations or increase the frequency or severity of any existing violations, or delay timely attainment of the PM_{10} or $PM_{2.5}$ NAAQS. Therefore, no direct air quality effects would be expected under Alternative 6.

Indirect

Under the No Build alternative, the existing lift-span bridge would not be replaced with a fixed span bridge. Therefore, marine traffic could continue using current routes, and there would be no indirect emissions from operations.

3.13.3.6 Evaluation of Health Risk Impacts

Caltrans as the Lead Agency and ACTA as a Responsible Agency have come to different conclusions with regards to ACTA's HRA and making significance determinations for each alternative. These conclusions are discussed below.

3.13.3.6.1 Caltrans' HRA Impact Evaluation

While Caltrans agrees that there may be adverse health impacts associated with operation of the proposed project, they have determined the impacts are less than significant. This finding is based on (1) the uncertainty of ACTA's HRA assumptions, methodology and findings as they relate to statements of risk for specific projects and (2) the evaluation of ATCA's HRA by the UC Davis – Caltrans Air Quality Project Team (Appendix B to the Supplemental Draft EIS/Recirculated EIR). The following is an evaluation of ACTA's HRA by Caltrans and UCD:

ACTA's Health Risk Assessment used an industry- and regulatory-standard dispersion model (U.S. Environmental Protection Agency's (EPA's) AERMOD[3]) and worst-case meteorological and traffic assumptions. The Health Risk Assessment methodology described in the California Office of Environmental Health Hazard Assessment (OEHHA) Health Risk Assessment Guidance[4], and the South Coast Air Quality Management District (SCAQMD) California Environmental Quality Act (CEQA) Handbook[5] was used. In general, this method uses worst-case assumptions including: use of the highest possible emission factors; use of the highest available traffic volumes or other measures of emission strength; worst-case meteorology, and the assumption that persons at residential receptors will be exposed to the maximum pollutant concentrations for 70 years, 24 hours/day, 350 days/year.

The HRA used vehicle emission factors for specific years from the current version of the California Air Resources Board (ARB) EMFAC on-road mobile source emission inventory model (EMFAC2007)[6]. The EMFAC model is used in California instead of U.S. EPA's MOBILE6[7] emission inventory model. EMFAC does not directly produce emission factors for toxic air contaminants from mobile sources (Mobile Source Air Toxics – MSAT). MSAT emission factors must be calculated "off-model" by determining the fractions of Total Organic Gas (TOG) and particulate matter emission factors that represent the toxic compounds of interest, from various types of vehicle activity. This process uses "speciation factors" provided by California ARB[8]. The HRA used emission factors only for years 2003, 2015, and 2030, with adjustments to account for a specific truck emission reduction program committed to by the ports of Los Angeles and Long Beach as well as estimated diesel particulate matter (DPM) reduction in future years based on CARB's draft scoping plan for AB32. This is an extremely conservative, even worst-case, assumption, because EMFAC accounts for vehicle fleet emission improvements over time based on regulations in force at the time a particular EMFAC version is developed. EMFAC, as used in other types of air quality modeling such as for criteria pollutants like carbon monoxide and particulate matter, would show substantially decreasing emissions from the truck fleet over time as diesel engine emission controls become more stringent. Ignoring this well-documented effect artificially increases the assumed emissions, modeled pollutant concentrations, and modeled health risks. See Figure 3.13-1 for an illustration of MSAT emission trends for the South Coast Air Basin using EMFAC 2007 and ARB speciation factors as packed in the CT-EMFAC tool[9].

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[3] US EPA Support Center for Air Quality Models, accessed 9/15/2008: http://www.epa.gov/scram001/dispersion_prefrec.htm#aermod

[4] California Office of Environmental Health Hazard Assessment, accessed 9/15/2008: http://www.oehha.ca.gov/air/hot_spots/HRAguidefinal.html

[5] South Coast Air Quality Management District, accessed 9/16/2008: http://www.aqmd.gov/ceqa/handbook/mobile_toxic/mobile_toxic.html

[6] California Air Resources Board, accessed 9/15/2008: http://www.arb.ca.gov/msei/msei.htm

[7] US EPA OTAQ, accessed 9/15/2008: http://www.epa.gov/OTAQ/m6.htm

[8] California Air Resources Board, accessed 9/15/2008: http://www.arb.ca.gov/ei/speciate/speciate.htm

[9] California Dept. of Transportation, Air Quality web site, accessed 9/30/22008: http://www.dot.ca.gov/hq/env/air/pages/ctemfac_license.htm

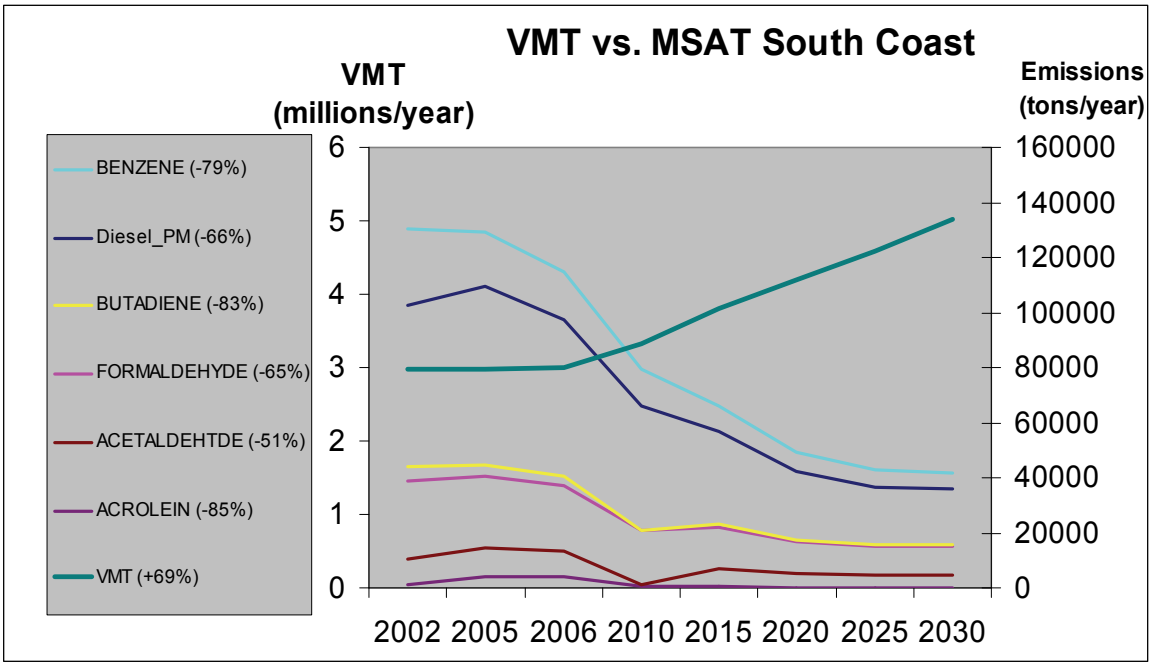


Figure 3.13-1

MSAT Trends in the South Coast Air Basin

Schuyler Heim Bridge Replacement and SR-47 Expressway

EMFAC does have limitations for MSAT analysis, including:

- EMFAC does not provide emission factors beyond 2040 at this time (EMFAC 2007), so a 70-year analysis using EMFAC must make assumptions regarding the behavior of vehicle fleet emissions after that. The normal, and conservative, response would be to assume that 2040 emission rates remain constant for the rest of the analysis period.
- The current (2007) version of EMFAC does not include estimates of the effect of diesel fleet regulations adopted by the ARB since 2006, which are intended to accelerate near-term emission reductions by requiring expedited conversion of the vehicle fleet to newer engines and use of emission reduction retrofits. These programs would have a similar effect to the LNG-powered Port truck program considered in the HRA, but applied over the entire truck and off-road diesel-powered equipment fleets. It is very likely, therefore, that vehicle fleet emissions of MSAT will decline faster, and possibly more, than is presently accounted for in EMFAC 2007 and ARB's speciation factors. This effect is also not accounted for in the standard approach to HRA, so MSAT emissions in the project area will almost certainly be considerably lower than what was estimated in the HRA document. The HRA document does include an analysis using 2015 emissions (the year the project would open) rather than 70-year projected emissions, which shows a substantial reduction in impact for the 2015-based analysis.

FHWA states in its Interim Guidance for MSAT analysis[10] that current approaches to quantitative health risk assessment include many uncertainties, and that it is not appropriate at this time to base project approval and alternative choice decisions on such studies. OEHHA agrees that substantial uncertainty exists, but advises the use of highly conservative assumptions to provide a "safety factor" given the uncertainty.

The HRA performed by ACTA, based on a conservative approach derived from OEHHA procedures, indicates that Alternative 1 will at most impact a small number of residences, and no other types of sensitive receptor, at a level barely exceeding the SCAQMD threshold. Alternative 2 would more severely impact a larger number and sensitivity of receptors, including schools. The HRA indicates that, even using the most conservative approach, there would not be a significant non-cancer risk increase, and that workplace cancer and non-cancer risks resulting from the project are also less than significant.

If a standard of "reasonably foreseeable" effects rather than "worst case" were used, Alternative 1 would not have significant impacts. Alternative 2 would have a greater impact regardless of assumptions due to the number and sensitivity of, and short distance to, receptors, and the higher increment of risk in the affected area. The "reasonably foreseeable" effect is based on consideration of continued Total Organic Gas and Diesel Exhaust Particulate Matter (DPM) emission reductions in the future, as projected by the EMFAC2007 model; additional State, Federal, and local (SCAQMD) programs enacted after the model was released; and consideration of reduced near-term travel activity due to goods movement responses to varying economic conditions (Port activity growth substantially slowed in 2007-8).

3.13.3.6.1.1 Alternatives 1 and 1A: Bridge Replacement and SR-47 Expressway

Based on the HRA evaluation, Caltrans does not believe that there is adequate or satisfactory evidence to support a determination of a significant impact due to exposure to air toxics. The evidence provided in ACTA's HRA document is not sufficient to make the determination of a CEQA significance related to increased cancer risk for this project.

3.13.3.6.1.2 Alternative 2 SR-103 Extension to Alameda Street

As stated above, Caltrans does not believe that there is adequate or satisfactory evidence to support a determination of a significant impact due to exposure to air toxics and that the evidence provided in ACTA's HRA is not sufficient to make the determination of a CEQA significance related to increased cancer risk for this project. Alternative 2 may have a greater impact related to MSATs even considering "reasonably foreseeable" rather than worst-case effects, due to the proximity of schools and a larger number of residences than Alternative 1. Alignment modification to reduce impacts would be difficult for this alternative due to the adjacent land uses and character of the existing facility, and HVAC installation/ modification as proposed by ACTA for Alternative 1 would, if done, need to be on a much larger scale with less confidence that risks would be substantially reduced. Impacts on certain sensitive land uses, like outdoor play areas of schools and parks adjacent to the freeway, would not be feasible to mitigate.

[10] Federal Highway Administration (FHWA), accessed 9/15/2008: http://www.fhwa.dot.gov/environment/airtoxic/020306guidmem.htm

3.13.3.6.1.3 Alternative 3: Bridge Demolition Avoidance

Health risk impacts of Alternative 3 would be the same as Alternative 1.

3.13.3.6.1.4 Alternative 4: Bridge Replacement Only

The operational effects of Alternative 4 would be the same as Alternative 6. Data are insufficient to quantitatively indicate whether these alternatives would or would not have a significant MSAT impact compared to the Baseline (2003) condition. However, qualitative consideration of traffic and other air quality studies suggests that truck traffic would be closer to sensitive receptors and operating under higher-emitting urban street conditions, leading to potential MSAT impacts of the no build option that would be higher than those of the build alternatives.

3.13.3.6.1.5 Alternative 5: Transportation System Management

The operational effects of Alternative 5 would be similar to the effects discussed under Alternative 4.

3.13.3.6.1.6 Alternative 6: No Build

The operational effects of Alternative 6 would be the same as discussed above, under Alternative 4.

3.13.3.6.2 ACTA's Evaluation of Health Risk Impacts

Two emission scenarios were included in the HRA for the cancer risk analysis: one based on 2015 emissions and the other one based on 70-year average emissions. Both scenarios evaluated cancer risk over a 70-year period. However, due to the uncertainties associated with the 70-year average emissions scenario (see Section 3.13.3.4.3.2 for details), cancer risk was considered significant only when the 2015 emissions scenario predicted an incremental increase in risk that would exceed the SCAQMD significance threshold. The following sections provide ACTA's determination of significance for the project alternatives.

3.13.3.6.2.1 Alternatives 1 and 1A: Bridge Replacement and SR-47 Expressway

Non-cancer Risks

Acute and chronic hazard indexes would be below the significance threshold of 1 for all receptors. Therefore, ACTA has determined that the non-cancer risk under Alternative 1 would be less than significant.

Cancer Risks

HRA Results of the 2015 Emission Scenario (preferred)

The results of the 2015 emission scenario indicate that the proposed project would result in substantial regional benefits that reduce risk from exposure to diesel exhaust in the majority of the study area. However, there would be localized areas of increased cancer risks. The main areas where increased cancer risk occurs would be along Alameda Street and the new SR-47 expressway.

Table 3.13-17 presents the maximum cancer risks from the 2015 emission scenario. The worker, student, and recreational user incremental cancer risk would be less than 10 in one million. Therefore, the cancer risk to these receptors would be less than significant. The Long Beach neighborhood incremental cancer risk would be 5.4 in one million, the Dominguez neighborhood incremental cancer risk would be 9.8 in one million, the Lincoln Village neighborhood incremental cancer risk would be 10.1 in one million, and the Wilmington neighborhood incremental cancer risk would be 10.6 in one million. The cancer risk for the Lincoln Village and Wilmington residential receptors would exceed the significance threshold of 10 in one million; therefore, ACTA finds the cancer risk for these residential receptors would be significant. The significant incremental increase in cancer risk affects a small number of homes (less than 30). Feasible mitigation measures would be available to reduce the estimated risk to less than the significant.

HRA Results of the 70-year Emission Scenario (for information only)

The 70-year average emissions scenario indicates that Alternative 1 would result in substantial regional benefits of reduced cancer risks in the majority of the study area. However, there would be localized areas of increased cancer risks. The main areas where increased cancer risk occurs would be along Alameda Street and the new SR-47 expressway.

Table 3.13-18 presents the maximum cancer risk for the 70-year emission scenario. The worker, student, and recreational user incremental cancer risk would be less than 10 in one million. Therefore, the cancer risk to these receptors would be less than significant. The Wilmington neighborhood incremental cancer risk would be 10.3 in one million, the Long Beach neighborhood incremental cancer risk would be 10.4 in one million, the Dominguez neighborhood incremental cancer risk would be 13.6 in one million, and the Lincoln Village neighborhood incremental cancer risk would be 13.7 in one million. The incremental cancer risk for the residential receptors would exceed the significance threshold of 10 in one million; therefore, ACTA finds the cancer risk for the residential receptors would be significant.

In summary, based on the local significance threshold, ACTA finds that for Alternative 1, or 1A the project would have a significant impact on a number of residential receptors in the project vicinity. Mitigation measures to reduce the cancer risks were evaluated and it was ACTA's determination that retrofits of heating, ventilating and air conditioning (HVAC) units would be feasible mitigation measure to reduce the incremental cancer risks. The residential cancer risk impacts after mitigation are expected to be below the SCAQMD significance threshold on 10 in one million. ACTA has determined that Alternative 1, or 1A, would not cause significant acute or chronic risk impacts to receptors in the project area.

3.13.3.6.2.2 Alternative 2 SR-103 Extension to Alameda Street

Non-cancer Risks

Acute and chronic hazard indexes would be below the significance threshold of 1 for all receptors. Therefore, ACTA has determined that the non-cancer risk under Alternative 2 would be less than significant.

Table 3.13-17
Summary of Sensitive Receptor Cancer Risk

Alternative 1: 2015 Emission Scenario
Cancer risk is expressed as number per one million population

Residential Regions	Receptor[a]	UTM Coordinates[b]		Residential Risk		
		East (m)	North (m)	Baseline	Alt 1	Increase
Dominguez	2535	386,675	3,744,275	87.8	97.6	9.8
Lincoln Village	2389	386,525	3,743,825	84.9	95.0	10.1
Long Beach	2274	386,675	3,743,375	52.5	57.9	5.4
Wilmington	1548	384,975	3,740,025	39.7	50.3	10.6

Recreational Areas	Receptor[a]	UTM Coordinates[b]		Worker Risk			Recreational User Risk		
		East (m)	North (m)	Baseline	Alt 1	Increase	Baseline	Alt 1	Increase
Hudson Park	1677	386,825	3,740,325	10.9	11.3	0.4	16.4	17.0	0.6

School Areas	Receptor[a]	UTM Coordinates[b]		Worker Risk			Student Risk		
		East (m)	North (m)	Baseline	Alt 1	Increase	Baseline	Alt 1	Increase
Cabrillo High School	1623	386,775	3,740,225	10.8	11.2	0.4	2.5	2.6	0.1

Note:
[a] - Multiple receptors may share maximum risk increase; receptor listed is lowest-numbered.
[b] - Universal Transverse Mercator projection, Zone 11, NAD 83.

Table 3.13-18
Summary of Sensitive Receptor Cancer Risk

Alternative 1: 70-year Average Emission Scenario
Cancer risk is expressed as number per one million population

Residential Regions	Receptor[a]	UTM Coordinates[b]		Residential Risk		
		East (m)	North (m)	Baseline	Alt 1	Increase
Dominguez	2535	386,675	3,744,275	164.0	177.6	13.6
Lincoln Village	2389	386,525	3,743,825	160.0	173.7	13.7
Long Beach	2254	386,725	3,743,275	109.0	119.4	10.4
Wilmington	1372	384,875	3,739,375	99.8	110.1	10.3

Recreational Areas	Receptor[a]	UTM Coordinates[b]		Worker Risk			Recreational User Risk		
		East (m)	North (m)	Baseline	Alt 1	Increase	Baseline	Alt 1	Increase
Hudson Park	1695	386,825	3,740,425	27.6	27.4	None	41.5	41.0	None

School Areas	Receptor[a]	UTM Coordinates[b]		Worker Risk			Student Risk		
		East (m)	North (m)	Baseline	Alt 1	Increase	Baseline	Alt 1	Increase
Cabrillo High School	1623	386,775	3,740,225	31.0	30.6	None	7.2	7.1	None

Note:
[a] - Multiple receptors may share maximum risk increase; receptor listed is lowest-numbered.
[b] - Universal Transverse Mercator projection, Zone 11, NAD 83.

Cancer Risk

HRA Results of the 2015 Emission Scenario

The 2015 emissions scenario indicates that Alternative 2 would result in substantial regional benefits of reduced cancer risks in the majority of the study area. However, there would be localized areas of increased cancer risks. The main areas of increased risk would be along existing SR-103 and its extension from Sepulveda to 223rd Street.

Table 3.13-19 presents the maximum cancer risks from the 2015 emission scenario. The recreational worker and student incremental cancer risk would be less than 10 in one million. Therefore, the cancer risk to these receptors would be less than significant. The Cabrillo High School worker and Hudson Park recreational user incremental cancer risk would be greater than 10 in one million. Therefore, ACTA finds the cancer risk to these receptors would be significant. There would be no incremental increase for cancer risk in the Wilmington neighborhood, the Dominguez neighborhood incremental cancer risk would be 6.3 in one million, the Lincoln Village neighborhood incremental cancer risk would be 6.9 in one million, and the Long Beach neighborhood incremental cancer risk would be 16.1 in one million. The cancer risk for the Long Beach residential receptor would exceed the significance threshold of 10 in one million; therefore, ACTA finds the cancer risk for this receptor would be significant. The significant incremental increase in cancer risk affects a small number of homes (less than 150). Feasible mitigation measures would be available to reduce the residential and school worker risk to less than significant. However, feasible mitigation measures have not been identified for the recreational user and this impact would remain significant.

HRA Results of the 70-year Emission Scenario

The 70-year average emissions scenario indicates that Alternative 2 would result in substantial regional benefits of reduced cancer risks from exposure to diesel exhaust in the majority of the study area. The 70-year average emissions scenario indicates there would be localized areas of increased cancer risks. The main areas of increased risk would be along existing SR-103.

Table 3.13-20 presents the maximum cancer risks from the 70-year emission scenario. The student incremental cancer risk would be less than 10 in one million. Therefore, the cancer risk to this receptor would be less than significant. The Cabrillo High School worker, Hudson Park worker, and Hudson Park recreational user incremental cancer risk would be greater than 10 in one million. Therefore, ACTA finds the cancer risk to these receptors would be significant. The Wilmington neighborhood incremental cancer risk would be 1.5 in one million, the Dominguez neighborhood incremental cancer risk would be 18.7 in one million, the Lincoln Village neighborhood incremental cancer risk would be 18.7 in one million, and the Long Beach neighborhood incremental cancer risk would be 19.9 in one million. The cancer risk for the Dominguez, Lincoln Village, and Long Beach residential receptors would exceed the significance threshold of 10 in one million; therefore, ACTA finds the cancer risk for these receptors would be significant. The significant incremental increase in cancer risk affects a small number of homes (less than 150). Feasible mitigation measures would be available to reduce the residential and school worker risk to less than the significant. However, feasible mitigation measures have not been identified for the recreational worker or recreational user; therefore, ACTA has determined that this impact would remain significant.

Table 3.13-19
Summary of Sensitive Receptor Risks

Alternative 2: 2015 Emission Scenario
Cancer risks is expressed as number per one million population

Residential Regions	Receptor[a]	UTM Coordinates[b]		Residential Risk		
		East (m)	North (m)	Baseline	Alt 2	Increase
Dominguez	2535	386,675	3,744,275	87.8	94.1	6.3
Lincoln Village	2389	386,525	3,743,825	84.9	91.8	6.9
Long Beach	1736	387,125	3,740,525	50.1	66.2	16.1
Wilmington	1189	384,325	3,738,725	26.7	26.4	None

Recreational Areas	Receptor[a]	UTM Coordinates[b]		Worker Risk			Recreational User Risk		
		East (m)	North (m)	Baseline	Alt 2	Increase	Baseline	Alt 2	Increase
Hudson Park	1677	386,825	3,740,375	10.9	20.3	9.4	16.4	30.5	14.1

School Areas	Receptor[a]	UTM Coordinates[b]		Worker Risk			Student Risk		
		East (m)	North (m)	Baseline	Alt 2	Increase	Baseline	Alt 2	Increase
Cabrillo High School	1623	386,775	3,740,225	10.8	22.7	11.9	2.5	5.3	2.8

Note:
[a] - Multiple receptors may share maximum risk increase; receptor listed is lowest-numbered.
[b] - Universal Transverse Mercator projection, Zone 11, NAD 83.

Table 3.13-20
Summary of Sensitive Receptor Risks

Alternative 2: 70-year Average Emission Scenario
Cancer risk is expressed as number per one million population

Residential Regions	Receptor[a]	UTM Coordinates[b]		Residential Risk		
		East (m)	North (m)	Baseline	Alt 2	Increase
Dominguez	2586	386,725	386,725	164.0	182.7	18.7
Lincoln Village	2389	386,525	386,525	160.0	178.7	18.7
Long Beach	1718	387,125	387,125	116.0	135.9	19.9
Wilmington	1191	384,425	384,425	60.7	62.2	1.5

Recreational Areas	Receptor[a]	UTM Coordinates[b]		Worker Risk			Recreational User Risk		
		East (m)	North (m)	Baseline	Alt 2	Increase	Baseline	Alt 2	Increase
Hudson Park	1695	386,825	3,740,425	27.6	39.4	11.8	41.5	59.1	17.7

School Areas	Receptor[a]	UTM Coordinates[b]		Worker Risk			Student Risk		
		East (m)	North (m)	Baseline	Alt 2	Increase	Baseline	Alt 2	Increase
Cabrillo High School	1623	386,775	386,775	31.0	46.1	15.1	7.2	10.7	3.5

Note:
[a] - Multiple receptors may share maximum risk increase; receptor listed is lowest-numbered.
[b] - Universal Transverse Mercator projection, Zone 11, NAD 83.

In summary, based on the local significance threshold, ACTA has determined that Alternative 2 would have a significant impact on a number of residential receptors as well as school workers and recreational users in the project vicinity. Mitigation measures to reduce the cancer risks were evaluated and it was determined that retrofits of HVAC units would be a feasible mitigation measure to reduce the incremental cancer risks for residential and school worker receptors. However, since recreational user exposure occurs outdoors at Hudson Park, the HVAC retrofits would not be an effective approach. Therefore, ACTA has determined that the cancer risk for recreational users at Hudson Park would remain significant.

3.13.3.6.2.3 Alternative 3: Bridge Demolition Avoidance

Health risk impacts of Alternative 3 would be the same as Alternative 1.

3.13.3.6.2.4 Alternative 4: Bridge Replacement Only

Alternative 4 (Bridge Only) is equivalent in terms of traffic to the No Build alternative. The operational effects of Alternative 4 would be the same as Alternative 6 (No Build). In ACTA's HRA, health risk impacts of Alternative 4 were not evaluated by comparison to Alternative 6 (No Build) since the impacts would be expected to be the same.

3.13.3.6.2.5 Alternative 5: Transportation System Management

Health risk impacts due to Alternative 5 were not evaluated but would be anticipated to be the same the No Build alternative.

3.13.3.6.2.6 Alternative 6: No Build

For the purposes of this analysis, the No Build alternative was used as the baseline condition for ACTA's health risk analysis.

3.13.3.6.3 Conservative Nature and Uncertainties of the HRA

By their nature, health risk estimates cannot be completely accurate because scientists, medical experts, regulators, and practitioners do not completely understand how toxic air pollutants harm human cells or how different pollutants might interact with each other in the human body. The exposure assessment often relies on computer models that are based on a multitude of assumptions, both in terms of present and future conditions.

When information is missing or uncertain, risk analysts generally make assumptions that tend to prevent them from underestimating the potential risk. These assumptions provide a margin of safety in the protection of human health. Again, to protect public health, these assumptions are very conservative. For example, for residential exposures risk assessments assume continuous exposure to the maximum dose for 70 years. However, most people do not stay in one place for 24 hours a day, 350 days a year and 70 years.

Additionally, no single universal way exists of doing health risk assessments, leading to possible problems in comparing different risks. Assumptions also change over time, and even HRAs completed using the same models can produce different results.

OEHHA has provided a discussion of risk uncertainty, which is reiterated here (OEHHA, 2003).

> *There is a great deal of uncertainty associated with the process of risk assessment. The uncertainty arises from lack of data in many areas necessitating the use of assumptions. The assumptions used in these guidelines are designed to err on the side of health protection in order to avoid underestimation of risk to the public. Sources of uncertainty, which may either*

overestimate or underestimate risk, include: 1) extrapolation of toxicity data in animals to humans, 2) uncertainty in the estimation of emissions, 3) uncertainty in the air dispersion models, and 4) uncertainty in the exposure estimates. Uncertainty may be defined as what is not known and may be reduced with further scientific studies. In addition to uncertainty, there is a natural range or variability in the human population in such properties as height, weight, and susceptibility to chemical toxicants. Scientific studies with representative individuals and large enough sample size can characterize this variability.

Interactive effects of exposure to more than one carcinogen or toxicant are also not necessarily quantified in the HRA. Cancer risks from all emitted carcinogens are typically added, and hazard quotients for substances impacting the same target organ system are added to determine the hazard index (HI). Many examples of additivity and synergism (interactive effects greater than additive) are known. For substances that act synergistically, the HRA could underestimate the risks. Some substances may have antagonistic effects (lessen the toxic effects produced by another substance). For substances that act antagonistically, the HRA could overestimate the risks.

Other sources of uncertainty, which may underestimate or overestimate risk, can be found in exposure estimates where little or no data are available (e.g., soil half-life and dermal penetration of some substances from a soil matrix).

The differences among species and within human populations usually cannot be easily quantified and incorporated into risk assessments. Factors including metabolism, target site sensitivity, diet, immunological responses, and genetics may influence the response to toxicants. The human population is much more diverse both genetically and culturally (e.g., lifestyle, diet) than inbred experimental animals. The intraspecies variability among humans is expected to be much greater than in laboratory animals. Adjustment for tumors at multiple sites induced by some carcinogens could result in a higher potency. Other uncertainties arise 1) in the assumptions underlying the dose-response model used, and 2) in extrapolating from large experimental doses, where, for example, other toxic effects may compromise the assessment of carcinogenic potential, to usually much smaller environmental doses. Also, only single tumor sites induced by a substance are usually considered. When epidemiological data are used to generate a carcinogenic potency, less uncertainty is involved in the extrapolation from workplace exposures to environmental exposures. However, children, a subpopulation whose hematological, nervous, endocrine, and immune systems, for example, are still developing and who may be more sensitive to the effects of carcinogens on their developing systems, are not included in the worker population and risk estimates based on occupational epidemiological data are more uncertain for children than adults. Finally, the quantification of each uncertainty applied in the estimate of cancer potency is itself uncertain.

Thus, risk estimates generated by an HRA should not be interpreted as the expected rates of disease in the exposed population but rather as estimates of potential risk, based on current knowledge and a number of assumptions. Additionally, the uncertainty factors integrated within the estimates of noncancer RELs are meant to err on the side of public health protection in order to avoid underestimation of risk. Risk assessment is best used as a ruler to compare one source with another and to prioritize concerns. Consistent approaches to risk assessment are necessary to fulfill this function.

3.13.3.7 CEQA Consequences

Potential impacts of the proposed project alternatives are assessed in the context of CEQA criteria for Air Quality in Chapter 4.0 – CEQA Analysis. Based on the above analysis, under

Alternatives 1, 2, 3, and 4, criteria pollutants impacts to air quality would be significant. Under Alternative 5, criteria pollutants impacts to air quality would be less than significant. Caltrans has determined that there is not adequate or satisfactory evidence to support a determination of a significant impact due to exposure to air toxics. The evidence provided in ACTA's HRA document is not sufficient to make the determination of a CEQA significance related to increased cancer risk for this project.

ACTA has determined that cancer risk impacts associated with Alternatives 1 and 3 would be significant for a limited number of residential receptors. Alternative 2 would have significant impacts on cancer risks for a number of residential receptors, parks, and workers in the project vicinity. Operation of Alternative 4 would be the same as Alternative 6 (No Build); therefore, no health risk increase is expected from Alternative 4. Cancer risks for Alternative 5 were not evaluated. Under Alternative 6, the project would not be constructed; therefore, there would be no impact to air quality or health risks. Significant impacts related to air quality are addressed in Section 4.5.1.

3.13.4 Avoidance, Minimization, and/or Mitigation Measures

3.13.4.1 Avoidance and Minimization Measures

No avoidance or minimization measures are proposed to reduce air quality impacts.

3.13.4.2 Mitigation Measures

3.13.4.2.1 Construction

3.13.4.2.1.1 Alternatives 1, 1A, 2, 3, and 4

The following mitigation measures would reduce air quality effects during project construction and provide the noted potential efficiencies as determined by SCAQMD.

Mitigation Measures for Fugitive $PM_{10}/PM_{2.5}$

AQ-1 Apply nontoxic soil stabilizers to all inactive construction areas (previously graded areas inactive for 10 days). Nontoxic soil stabilizers can reduce $PM_{10}/PM_{2.5}$ emissions from these areas by 30 to 65 percent.

AQ-2 Replace ground cover in disturbed areas as quickly as possible. A reduction of 15 to 49 percent in $PM_{10}/PM_{2.5}$ emissions for disturbed areas could be achieved.

AQ-3 Reduce traffic speed on all unpaved roads to 15 mph or less. $PM_{10}/PM_{2.5}$ emissions from travel on unpaved roads can be reduced by 40 to 70 percent by managing vehicle speeds.

Mitigation Measures for Exhaust Emissions of CO, ROG, NO_X and $PM_{10}/PM_{2.5}$

AQ-4 Develop and implement a trip reduction plan to achieve a 1.5 average vehicle ridership for construction employees. A trip reduction plan can reduce emissions of ROG, NO_X, CO, and PM_{10} from worker commutes by 0.1 to 2.2 percent, 0.1 to 2.9 percent, 0.1 to 2.9 percent, and 0.1 to 2.9 percent, respectively (SCAQMD, 1993).

AQ-5 Implement a shuttle service for construction workers to and from retail services and food establishments during lunch hours. A shuttle service can reduce emissions of ROG, NO_X, CO, and PM_{10} from lunch hour trips by 0.1 to 1.0 percent, 0.1 to 1.3 percent, 0.1 to 1.3 percent, and 0.1 to 1.3 percent, respectively (SCAQMD, 1993).

AQ-6 Prohibit truck idling in excess of 2 minutes. Employ periodic, unscheduled inspections to limit unnecessary idling. The SCAQMD has not quantified the efficiency of this mitigation measure.

AQ-7 Suspend use of all construction equipment operations during second-stage smog alerts. The SCAQMD has not quantified the efficiency of this measure.

AQ-8 Use electricity, if feasible, from power poles rather than temporary diesel- or gasoline-powered generators. Using electricity from power poles is an effective measure to reduce emissions of ROG, NO_X, CO, and PM_{10} from generators. Reduction efficiencies for these compounds are 97 to 99 percent.

AQ-9 Heavy Duty Truck Buyback Program

The purpose of the buyback program would be to accelerate the modernizing of the heavy duty engine fleet operating in the South Coast Air Basin. By removing the older engines in the fleet and requiring replacement with newer, cleaner vehicles, a net reduction of NO_X emissions (and other combustion pollutants) would occur. This reduction would help offset marine vessel detour emissions.

The protocols to be used would be consistent with the Carl Moyer Program, which is already being administered by the SCAQMD. However, this program is not available to projects such as Schuyler Heim Bridge Replacement and could not be used to actually implement this project's buy-back program. The Gateway Cities Diesel Fleet Modernization Program would be an example of a buyback program with similar reduction goals. Also, the POLA/POLB Clean Air Action Plan has a heavy duty truck buy back component. While participating in already existing programs might be preferable (and possible), it would not be necessary in order to accomplish heavy duty truck buy back. The heavy duty truck buy back could be done independently, though it would have to adhere to already accepted protocols (SCAQMD).

A heavy duty truck buyback program would consist of three steps: (1) identify target vehicles based on year of make; (2) provide incentives for operators to participate; and (3) establish a means to ensure that replacements meet the net improvement forecasted.

The construction phase of this project is where the greatest impact of increased emission levels occurs. Therefore, the buyback program would be designed to mitigate the NO_X emissions during that time. Based on recent buyback programs, the program for the proposed project would cost from $25,000 to $50,000/ton of NO_X reduced. This cost can vary significantly and will continue to increase as time passes. The number of tons mitigated would be based on marine vessel detour NO_X emissions during construction. The rerouting of shipping vessels during project construction would amount to 132.8 lbs NO_X per day, which is equivalent

to 24.2 tons NO_X per year. The indirect marine vessel emissions would be mitigated to a level that is below the SCAQMD significance threshold for construction emissions.

It is estimated that each truck replacement would reduce an average of 0.55 tons per year of NO_X and 0.12 tons per year of PM. This is based on emission factors representative of current buyback programs such as the Gateway Cities Diesel Fleet Modernization Program.

These emission reductions would continue for 3 to 5 years, depending on the year of the truck updated. This timeframe would exceed the duration of the project construction phase.

AQ-10 To the extent feasible, utilize construction equipment equipped with Tier 2 or new engines.

AQ-11 Maintain and tune engines per manufacturer's specifications to perform at EPA certification levels and to perform at verified standards applicable to retrofit technologies. Employ periodic, unscheduled inspections to ensure that construction equipment is properly maintained, tuned, and modified to established specifications.

AQ-12 Prohibit tampering with engines, and require continuing adherence to manufacturer's recommendations.

3.13.4.2.2 Operations

The following mitigation measures would reduce air quality effects during project operations.

3.13.4.2.2.1 Alternatives 1, 1A, and 3

The increase in NO_X emissions due to marine vessel detours during project operation would be offset by the emissions reductions achieved by the truck buyback program implemented during project construction. No avoidance, minimization, and/or mitigation measures are proposed for project operations.

3.13.4.3 Mitigation Measures for Health Risks

Because Caltrans has determined that there is no significant impact on public health, Caltrans is not proposing any avoidance, minimization or mitigation measures. However, based on its conclusions as a Responsible Agency, ACTA will adopt the mitigation measure below as a condition of its approval for the proposed project.

3.13.4.3.1 Alternatives 1, 1A, and 3

AQ-13 Retrofits of heating, ventilating and air conditioning (HVAC) units. New heating, ventilating, and air conditioning (HVAC) units, or retrofit of existing HVAC units, will be installed in residences within the vicinity of the significant impact zone.

These measures were evaluated and determined to be a feasible measure to reduce the incremental cancer risks of the project.

The rationale behind the choice of HVAC retrofits is as follows:

- This measure can be effectively implemented by a transportation authority and directly benefits the community that is impacted.
- The measure has been used effectively in mitigating the health risks of other transportation projects (e.g., San Diego Metropolitan Transit Development Board (SDMTDB) light rail).
- The retrofit of high efficiency filters on either an existing or new HVAC system will be capable of removing the pollutant that drives health risk in the community, namely diesel particulate matter.

For purposes of this assessment, the efficiency of diesel particulate removal is estimated to be 90 percent. This estimate is a conservative assumption, since the guaranteed removal rate is closer to 99 percent based on manufacturers' data. However, in this case, much lower removal rates (in the 20 to 30 percent range) would still be considered effective mitigation.

Since the maximum residential receptor risk along the transportation corridor in 2015 is estimated to be less than 11 in a million, HVAC retrofits would be an effective mechanism to mitigate incremental health risks to levels below the significance criterion threshold (10 in one million). The retrofits would involve installing new heating and air conditioning systems with high efficiency filters in selected homes along the expressway corridor. The filters would be capable of removing diesel particulate matter which is responsible for the majority of the contribution of health risk from the ambient air. HVAC retrofits are the preferred mitigation measure since this approach has been used in similar projects to protect sensitive receptors from diesel risk.

3.13.4.3.2 Alternative 2

Mitigation measures to reduce the cancer risks were evaluated and it was determined that retrofit of heating, ventilating and air conditioning (HVAC) units would be a feasible measure to reduce the incremental cancer risks at residential and school worker receptors. However, since recreational user exposure occurs outdoors at Hudson Park, the HVAC retrofits would not be an effective approach. Therefore, the cancer risk for recreational users at Hudson Park would remain significant.

3.13.4.3.3 Alternatives 4, 5 and 6

No mitigation measures were found to be necessary.

3.3 Community Resources

The following portions are from the updated Section 3.3.3, Environmental Justice, from the Community Resources section of the Draft EIS/EIR. They have been revised as a result of the information provided in ACTA's HRA. The underlined text represents new information that has been added.

3.3.3 Environmental Justice

3.3.3.3 Environmental Consequences

3.3.3.3.3 Evaluation of Alternatives

3.3.3.3.3.2 Adverse Effects to Overall Population

Air Quality: Project construction and operation would result in emissions of criteria pollutants above specified SCAQMD thresholds. Draft EIS/EIR Section 3.13 provides a detailed discussion of air quality impacts. Localized MSAT impacts would occur. In addition, a discussion of health risks effects is provided in Section 3.13.3.6. These impacts would be mitigated by ACTA as described in Section 3.13.4.2.2, AQ-13.

Analysis of Adverse Effects

Based on the discussion in Section 3.13 Air Quality (as amended), Caltrans has determined that the evidence provided in ACTA's HRA is not sufficient to make a determination of an adverse effect for health risk.

ACTA has made the following findings.

Air Quality – Alternatives 1, 1A, 2, and 3

- ACTA finds that Alternative 1, 1 A, and 3 would have significant impacts prior to mitigation on cancer risks to a number of residential receptors in the project vicinity, but would not cause significant impacts to acute and chronic risks to any of the receptors in the project area.
- ACTA finds that Alternative 2 would have significant impacts on cancer risks for a number of residential receptors, parks, and workers in the project vicinity, but would not cause significant impacts to acute and chronic risks to any of the receptors in the project area.

Potential Disproportionately High and Adverse Effects

Caltrans and ACTA both determine that the potential adverse effects resulting from the project would not be appreciably more severe or greater in magnitude on minority or low-income populations than they would be on the population as a whole. As noted in Section 3.13 Air Quality (as amended), most of the potential adverse effects could be satisfactorily avoided or minimized through implementation of avoidance, minimization, or mitigation measures. Because there has been no evidence to suggest that the efficacy of these measures would differ with respect to different population groups, the net result would be the same for all population groups for these resource areas. The adverse effects that have been identified as unavoidable even after implementation of mitigation would also not be appreciably more severe or greater in magnitude on minority or low-income populations. For example, the Schuyler Heim Bridge and the characteristics that qualify it for historic status are presumably of similar importance to all population groups.

4.0 CEQA Evaluation

The following is the updated Section 4.5.1 from Chapter 4.0 of the Draft EIS/EIR as a result of the information provided in ACTA's HRA.

4.5.1 Air Quality

4.5.1.1 Alternative 1

Operations Impacts

d) Would the project expose sensitive receptors to substantial pollutant concentrations?

The HRA results indicated that the project would produce substantial regional benefits that would reduce air toxic emissions and health risks in the majority of the study area. Caltrans has determined that there is not adequate or satisfactory evidence to support a determination of a significant impact associated with Alternative 1 due to exposure to air toxics. While ACTA has determined that cancer risk impacts associated with Alternative 1 would be significant at a number of homes, these localized impacts would be less than significant after mitigation (Mitigation Measure AQ-13).

4.5.1.2 Alternative 2

d) Would the project expose sensitive receptors to substantial pollutant concentrations?

The HRA results indicated that the project would produce regional benefits that would reduce air toxic emissions and health risks in the majority of the study area. Caltrans has determined that there is not adequate or satisfactory evidence to support a determination of a significant impact due to exposure to air toxics associated with Alternative 2. ACTA has determined that cancer risk impacts associated with Alternative 2 would be significant at a number of residential receptors as well as school workers and recreational users in the project vicinity. ACTA evaluated mitigation measures to reduce the cancer risks and determined that retrofits of HVAC units would be a feasible mitigation measure to reduce the incremental cancer risks for residential and school worker receptors. However, since recreational user exposure occurs outdoors at Hudson Park, the HVAC retrofits would not be an effective approach. Therefore, the cancer risk for recreational users at Hudson Park would remain significant.

4.5.1.3 Alternative 3

d) Would the project expose sensitive receptors to substantial pollutant concentrations?

Caltrans has determined that there is not adequate or satisfactory evidence to support a determination of a significant impact associated with Alternative 3 due to exposure to air toxics. Under Alternative 3, ACTA has determined that the potential impact for health risks would be similar to Alternative 1 and that impacts would be less than significant after mitigation (Mitigation Measure AQ-13).

4.5.1.4 Alternatives 4, and 6

d) Would the project expose sensitive receptors to substantial pollutant concentrations?

The operational effects of Alternative 4 would be the same as Alternative 6 (no-build). Health risk impacts of Alternative 4 were not evaluated in ACTA's HRA against the 2003 condition. However qualitative consideration of traffic and other air quality studies suggests that truck traffic would be closer to sensitive receptors and operating under higher-emitting urban street conditions, leading to potential health impacts of the no build option that would be higher than those of the build alternatives.

4.5.1.5 Alternatives 5

d) Would the project expose sensitive receptors to substantial pollutant concentrations?

Health risk impacts due to Alternative 5 were not evaluated but would be anticipated to be the same as Alternative 6, the no-build alternative.

5.0 Cumulative Impacts

The following is the updated Section 5.3.13 from Chapter 5.0 of the Draft EIS/EIR as a result of the information provided in ACTA's HRA. The underlined text represents new information that has been added.

5.3.13 Air Quality

Alternative 1

5.3.13.1.2 Operations Impacts

Based on the ACTA HRA evaluation, Caltrans does not believe that there is adequate or satisfactory evidence to support a determination of a significant impact due to exposure to air toxics. However, ACTA has determined that the HRA modeling results have indicated that the proposed project would have substantial regional benefits that would reduce health risks in the majority of the study area, and that therefore, there would be a net benefit to the cumulative health risk impacts. Although the maximum increase of cancer risks at some locations would exceed the 10 in a million threshold, it would only affect a limited number of homes, and the impacts would be mitigated to the level of less than significant through ACTA's proposed mitigation measure. Also, as a result of adopted CARB measures to reduce emissions of DPM from on-road trucks and the Clean Truck Program adopted as part of the ports' Clean Air Action Plan, emissions from trucks using the proposed project and the risk from exposure to air toxics would be expected to decrease in the future when compared to the results of the MATES-III study. Therefore, ACTA has determined that the project would be expected to have a less than significant adverse cumulative impact to human health risks. Non-cancer acute and chronic risks would decrease within the study area resulting in a less than significant cumulative impact.

Alternative 2

Based on the ACTA HRA evaluation, Caltrans does not believe that there is adequate or satisfactory evidence to support a determination of a significant impact due to exposure to air toxics. However, ACTA has determined that the HRA results for Alternative 2 indicated that cancer risk would increase at some of the residential and recreational users and school worker receptors. Cumulative impacts from Alternative 2 would be greater than Alternative 1. Recreational user cancer risks would remain significant after mitigation. Non-cancer acute and chronic risks would decrease within the study area resulting in a less than significant cumulative impact.

Alternative 3

Cumulative impacts under Alternative 3 would be the same as those described for Alternative 1.

Alternative 4

There would be no cumulative health risk impacts under Alternative 4.

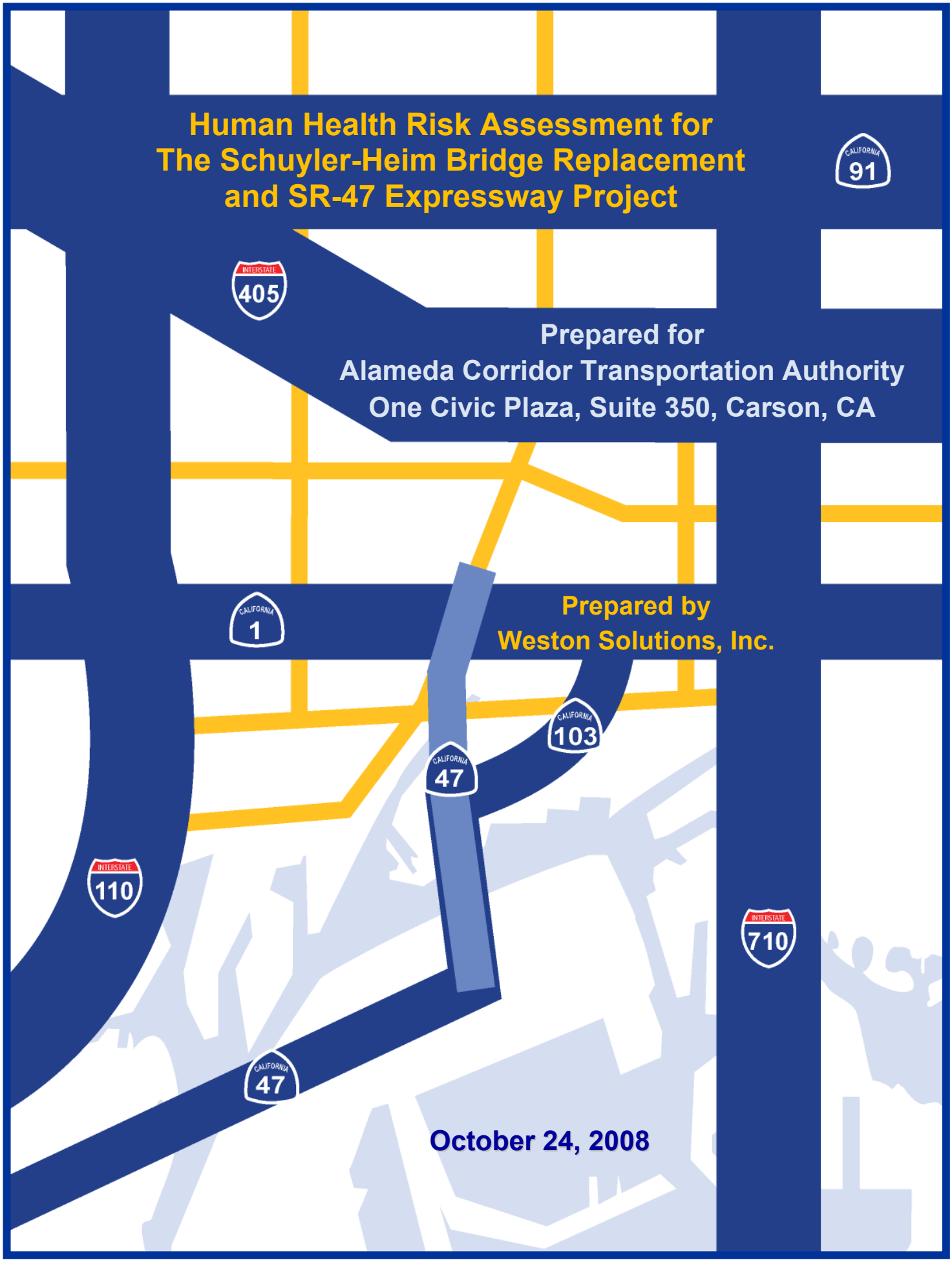
6.0 References

Federal Highway Administration (FHWA). "Federal Rationale for Inclusion of Health Risk Information," The Federal Highway Administration's Interim Guidance for Mobile Source Air Toxics (MSAT) Analysis. http://www.fhwa.dot.gov/environment/airtoxic/020306guidmem.htm. Accessed 9/15/2008.

USEPA. 2007. Letter to Ron Kosinski/Caltrans. September 20.

Appendix A
Health Risk Assessment

Human Health Risk Assessment for The Schuyler-Heim Bridge Replacement and SR-47 Expressway Project



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EXECUTIVE SUMMARY

The Alameda Corridor Transportation Authority (ACTA) has elected to perform a health risk assessment for the proposed Schuyler Heim Bridge Replacement and SR-47 Expressway project (the "project") as part of its funded portion of the project. The project is intended to improve goods movement in the ports of Los Angeles and Long Beach, which will reduce emissions from trucks and other motor vehicles calling on the ports. However, by relocating some vehicle trips from existing traffic corridors to the truck expressway portion of the project, the project could result in localized health impacts in some areas. The purpose of the assessment was to understand the impacts and benefits of the project both in terms of localized and regional health risk. The HRA focused on a broad geographic area, extending roughly 7.5 miles due north from the Schuyler Heim Bridge and over 5 miles north from the terminus of the actual improvements at Alameda Street and Pacific Coast Highway.

Health risk assessments are typically performed for projects (stationary sources) where emissions are confined to a single location. Such health risk assessments follow protocols adopted by the Office of Environmental Health Hazard Assessment (OEHHA) and the California Air Resources Board (CARB), as well as guidance from the South Coast Air Quality Management District (SCAQMD). However, such protocols may not be well suited to transportation projects where emissions occur in a line over significant distances, and in order to characterize health risk, extremely speculative assumptions must be made regarding the actual sources of the emissions – the trucks that travel the roadway. Such assumptions include levels of traffic over a 70-year period and the state of technology of the vehicles that comprise that traffic. No recognized health risk assessment protocols have been identified for transportation projects.

Nonetheless, to address community requests for such an assessment, a methodology has been developed to assess the potential health risks associated with the proposed project. The methodology is modeled after established protocols for stationary sources but recognizes the spatial differences inherent in transportation projects. Like a traditional health risk assessment, it projects risk over a 70-year period and makes certain assumptions about conditions in the future. The resulting analysis as presented in this report is a conservative assessment of project impacts in that it assumes significant growth in traffic (based on port projections) and traffic-related emissions but

does not account for the effect of probable future regulations that may significantly reduce vehicle emissions. For example, only existing and currently proposed regulations are taken into consideration in the development of vehicle emission profiles, even though it is highly likely that motor vehicle and fuel standards will continue to become more stringent over the next 70 years. Accordingly, there are concerns that the methodology when applied to transportation projects may be so conservative as to be unrealistic. Therefore, to test the conclusions about health risk, an alternative analysis, or sensitivity analysis, using different assumptions were conducted in an effort to develop a more realistic assessment.

Two emission scenarios were included in the health risk assessment (HRA), one based on 70-year average emissions (year 2003 through 2072) and the other one based on 2015 emissions. Both scenarios evaluated the risks over a 70-year period for several categories of exposed receptors (residential, commercial/industrial workers, recreational workers and users, and school workers and students).

The HRA utilizing the 70-year average emissions scenario evaluated cancer risks starting at the project baseline as defined by CEQA, in this case 2003 (Notice of Preparation), and extending to 2072. This analysis assumes that the San Pedro Ports Clean Truck Program is in place by 2015, the CARB "On-Road Heavy Duty Diesel Vehicles Regulations" are approved, the California Air Resources Board low carbon fuels regulations are implemented by 2020, and no other additional related regulations are promulgated between 2020 and 2072. The results of the assessment of the 70-year average emissions scenario indicate Alternative 1 would result in substantial regional benefits that reduce health risk from exposure to diesel exhaust in the majority of the study area. With regard to localized impacts, predicted incremental cancer risks for commercial/industrial workers, recreational workers and users, and school workers and students for this alternative are all estimated to be below the significance threshold of 10 in a million. The increase in cancer risk for the maximum exposed residential receptors is calculated to be less than 14 in a million for Alternative 1 and less than 20 in a million for Alternative 2, which is above the South Coast Air Quality Management District's significance criterion of 10 in a million. Alternative 2 also predicts a significant risk for workers at Hudson Park in this scenario. Acute and chronic hazard indexes of both Alternative 1 and Alternative 2 are below the significance threshold of 1 for all receptors.

To address the uncertainties related to future years' emissions with the 70-year average analysis, an alternative analysis of 70-year risk based on 2015 emissions was performed. This analysis uses emissions in 2015 as representative of project emissions over the life of the project. It uses projected traffic levels in 2015 and assumes that in 2015, the Ports Clean Truck Program and the CARB on-road heavy duty truck regulations are in place. The emissions in 2015 are assumed to be constant over a 70-year period and the resulting risk for 2105 is projected over 70 years to estimate lifetime cancer risk. In other words, emissions associated with increases in traffic are assumed to be offset by future regulations so that future emissions are no worse than what occurs in 2015. Since as a result of CARB and EPA regulations, vehicle emissions have been steadily decreasing despite significant increases in traffic, this is considered a conservative assumption. Under this analysis, predicted incremental cancer risks for commercial/industrial workers, recreational workers and users, and school workers and students for Alternative 1 are all estimated to be below the significance threshold of 10 in a million. Acute and chronic hazard indexes are all below the significance threshold of 1 for all receptors. In Alternatives 1 and 2, the maximum incremental residential cancer risk along the corridor are less than 11, and less than 17 in a million, respectively. The 2015 emissions scenario presents a more realistic and less uncertain risk estimate of this project risk for the following reasons:

- It relies on reasonably foreseeable traffic estimates (there is a higher confidence in near-term projections than projections in the 2020-2070 planning horizon).

- Only regulations mandated by law or currently proposed as regulations are included in the analysis (e.g., Ports' Clean Truck Program and CARB's On-Road Heavy Duty Diesel Vehicles Regulation, which is set for adoption by the Board in December of 2008).

- It assumes that regulatory efforts to reduce emissions from vehicles will not cease, but will continue as they have for several decades, and that these measures will, at a minimum, maintain emissions at no higher than 2015 levels.

Since under the alternative analysis, there are residential receptors predicted to have a health risk increase higher than the significance threshold of 10 in a million, CEQA requires mitigation to the extent feasible. To address localized health impacts, a heating, ventilating, and air conditioning

(HVAC) retrofit program is proposed for residences with potential incremental cancer risks greater than 10 in a million. The total number of homes to be mitigated in Alternative 1 is less than 30 and less than 150 in Alternative 2.

1.0 INTRODUCTION

The California Air Resources Board (CARB) has been evaluating diesel exhaust and other non-carcinogenic and carcinogenic pollutants since 1989 under California's air toxics program. In 1998, CARB declared diesel particulate matter a toxic air contaminant (TAC). An early impetus for control of mobile source non-carcinogenic and carcinogenic pollutants was the Multiple Air Toxics Exposure Study (MATES-II) released by the South Coast Air Quality Management District (SCAQMD) in March of 2000. Among the conclusions of that report was that the average carcinogenic risk in the South Coast Air Basin (SCAB) was several orders of magnitude above acceptable risk levels; diesel particulate constituted 70 percent of the risk, and mobile sources predominated in terms of source contribution. In response to this initial report, both CARB and the SCAQMD conducted environmental justice workshops in affected communities with an emphasis on neighborhoods with the highest incidence of truck traffic (e.g., near ports and airports). The MATES III study, released in January of 2008, indicates that SCAB has achieved some regional improvement in cancer risk, but concludes that risk is still significant near the ports and along major freeways.

During the project operation, the vehicles traveling on the bridge and expressway will result in combustion exhaust emissions that contain diesel particulate matter (DPM) and other toxic air contaminants. The public comments received on the draft EIS/EIR exhibited mounting concerns regarding health risk from such exhaust emissions and requested that a cancer, acute, and chronic health risk analysis be conducted for the project. Comments were received from neighborhood groups in Wilmington, Carson, and Long Beach along with environmental advocacy groups as part of the draft EIS/EIR public review process for the Schuyler Heim Bridge Replacement and SR-47 Expressway project.

Health risk assessments have been conducted under CEQA for projects in the Port area, such as the proposed TraPac marine terminal expansion project, which result in increased truck, train, and marine vessel traffic. The TraPac risk assessment addressed both non-carcinogenic and carcinogenic pollutants, as well as proposed measures to mitigate significant risk. However, no project to date has quantified the health risks associated with transportation infrastructure improvements at the ports

and the emissions quantification and dispersion modeling involved is substantially more complex, especially with regard to projecting future changes in traffic and emissions profiles.

Air quality experts associated with transportation projects have consistently asserted that more efficient infrastructure produces regional benefits by eliminating vehicle idling time and maintaining optimal speed produces reductions in emissions. For example, an air quality analysis of the Alameda Corridor Transportation Authority's dedicated freight rail system has shown reductions in regional emissions of both locomotive and truck diesel particulate by consolidating existing at-grade freight rail lines into a single below-grade corridor, thus reducing locomotive travel distance, and eliminating traffic delay at key intersections along pre-existing corridors as well as the consolidated corridor. On the other hand, it is generally acknowledged that micro-scale increases in pollutants (particularly diesel $PM_{2.5}$) may occur immediately adjacent to improved transportation corridors.

Most assessments of health risk focus on maximum impacts and worst-case risk estimates for a handful of specific receptors (e.g., residential, worker, school and recreational areas), generally located in areas closest to the proposed project. However, such assessments do not present a full picture of impacts for linear projects such as the proposed expressway. Also, results are reported as numbers in tabular format and are difficult for the general public to understand. In an effort to address these limitations and provide easily understandable graphics to address public concerns, Geographic Information System (GIS) visualization techniques have been included in this report that allow risk estimates to be overlain on land use planning maps, thus providing area-wide and neighborhood specific risk impacts for planning purposes.

1.1 Scope of the Assessment

Emissions of air toxics will occur from cars and trucks traveling along the project route during operation. Projected air toxics emissions from the project have been calculated as part of the Mobile Source Air Toxics (MSAT) analysis in order to comply with NEPA and are reported in the EIS for the project. The Federal Highway Administration (FHWA) and California Department of Transportation (Caltrans) are not aware of any science-based NEPA health risk assessment significance thresholds for transportation projects and have found no applicable significance

thresholds adopted by regulation. However, Caltrans has agreed to review this health risk assessment in response to local concerns with regard to air quality and ACTA's requirements as a responsible agency. Caltrans decision to review the ACTA HRA as a means of comparing project alternatives is in the spirit of full disclosure, under NEPA.

The City of Los Angeles has adopted the L.A. CEQA Thresholds Guide (City of Los Angeles 2006) that references the SCAQMD CEQA Air Quality Handbook (SCAQMD 1993) and USEPA AP-42 in calculating and determining the significance of project emissions. Pursuant to the L.A. CEQA Thresholds Guide, health risk is considered significant if the incremental increase of cancer risks due to a project exceeds ten in one million (10×10^{-6}) or if the increase of chronic or acute hazard index from the project exceed 1.0. These thresholds generally have been applied to proposed development projects rather than linear projects such as the proposed transportation project. However, for purposes of the proposed project analysis ACTA[1] has elected to conduct a health risk analysis as part of its funded portion of the project under CEQA and to use the health risk significance levels in the L.A. CEQA Thresholds Guide. The reasons for conducting such an analysis are as follows:

1. Residents of local communities with commercial and residential land uses adjacent to the transportation corridor who submitted comments on the draft EIS/EIR requested that air toxics associated with increased truck traffic be addressed. There are local protocols for stationary sources currently in use for performing such health risk assessments and established SCAQMD thresholds for evaluating the significance of health risk that were adapted for use in this application.

2. ACTA is a Responsible Agency under CEQA and will be implementing the expressway portion of this project. This work will require Port Development Permits from the Port of Long Beach and Port of Los Angeles; ACTA will be required to submit a health risk assessment in support of its application for the permits. CEQA documents prepared in support of recent Port development permits have all included quantitative health risk assessments.

[1] ACTA is a joint powers authority. The City of Los Angeles and the Port of Los Angeles are members of ACTA.

Therefore, at ACTA's instruction, a health risk assessment was performed in order to evaluate the significance of air toxics emissions under CEQA because ACTA is providing substantial funding for the project and is willing to fund appropriate air quality mitigation for any identified significant health risk impact. The purpose of the assessment is to understand both the adverse impacts and benefits of the project in terms of localized and regional health risk. The scope of the ambient air quality dispersion modeling and subsequent health risk assessment (HRA) of non-carcinogenic and carcinogenic pollutants focused on a broad geographic area, extending roughly 7.5 miles due north from the Schuyler Heim Bridge and over 5 miles from the terminus of the actual improvements at Alameda Street and Pacific Coast Highway. The scope of the health risk assessment focused on both incremental cancer and non-cancer acute and chronic health risk impacts from Port trucks, local South Coast Air Basin (SCAB) trucks, and cars along major roadways that provide ingress and egress of goods to the Ports of Los Angeles and Long Beach. Two emission scenarios were evaluated. Cancer risks for residential, school, worker, and recreation receptors were evaluated using an average emission rate for the time period from 2003 to 2072. For significance evaluation and mitigation purposes, a second analysis was conducted utilizing 2015 emission rates throughout the 70-year period. The assumptions for both analyses are described in Section 2.

Incremental impacts from the project were analyzed from the south at the beginning of the SR-47 at Ocean Boulevard and continuing north beyond the I-405 to SR-91. The modeled roadways include all segments of the SR-47, SR-103, traffic along the major north-south arterials that are directly impacted by the SR-47 and Port truck traffic, including Henry Ford and Alameda Street.

In order to characterize the potential regional benefit of the infrastructure improvement project, incremental health risks from surface streets that traverse SR-47/SR-103 transportation corridor from the I-110 to the I-710 freeways were also simulated using regional traffic estimates.

The air dispersion modeling and health risk assessment represents a local micro-scale analysis, which characterizes the concentrations of both non-carcinogenic and carcinogenic pollutants associated with Port and SCAB traffic along truck routes originating from the Port. Since the re-routing of truck traffic will increase the traffic density in certain areas, there are inevitably small, localized impacts close to roadways. Conversely, since trucks will be more heavily concentrated along the improved expressway, less truck traffic will occur on surface streets. Using traffic

projections from recent local planning studies, this analysis characterizes the extent and magnitude of these localized hot-spots as well as localized benefits from reducing truck traffic on nearby surface streets. A very important aspect of this hot-spot characterization is the delineation of land use, so that specific exposure assessment and health risks along these corridors can be properly depicted.

The incremental health risks associated with changes in traffic patterns in the vicinity of the project was characterized in the following multi-step manner:

1) ***Emission Estimation:*** Quantifying the non-carcinogenic and carcinogenic air toxic emissions from the Port truck traffic, as well as SCAB traffic on existing and future roadways, using EPA/CARB-approved emission factors and models such as EMFAC2007.

2) ***Source Characterization:*** Characterizing the release of the emissions by defining multiple volume source releases along the roadway surface using actual geographic coordinates and elevations from existing roadways and design drawings for the various alternatives, following methodology previously approved in recent NEPA/CEQA documents (e.g., TraPac).

3) ***Ambient Air Quality Modeling:*** Using an appropriate air quality dispersion model (AERMOD) and meteorological data set (St. Peter/Paul School) to model the dispersion of pollutants to downwind receptors; and

4) ***Exposure Assessment:*** Estimating the short and long-term ground level concentrations of pollutants at receptors of interest and converting those concentrations via the CARB *Hotspots Analysis Reporting Program* (HARP, Version 1.4a, July 2008) to the appropriate corresponding hazard index or carcinogenic risk at each receptor.

5) ***Mitigation Approach:*** Where potentially significant risk is identified, evaluating the nature of the exposure and evaluating feasible methods of mitigating predicted risk to less than significant.

1.2 Project Description

The FHWA and Caltrans are proposing to replace the existing Schuyler Heim Bridge to meet current seismic criteria. Concurrently, ACTA proposes to construct an expressway along SR-47 or SR-103 to provide a high-capacity alternative route (to the I-710 and I-110) for traffic between Terminal Island and I-405. The Schuyler Heim Bridge is located within the City and Port of Long Beach, and Terminal Island is co-located within the Port of Long Beach and Port of Los Angeles.

The project study area addressed in this analysis is bordered by I-710 on the east, I-110 on the west, SR-91 on the north, and Ocean Boulevard on the south (see Figure 1-1). As shown, the Schuyler Heim Bridge is located within the City and Port of Long Beach. The expressway portions would be located in the City and Port of Los Angeles (Alternative 1) or in the Cities of Los Angeles, Long Beach, and Carson, and the Ports of Los Angeles and Long Beach (Alternative 2). The main bridge and SR-47 Expressway is assumed be constructed between 2009 and 2011. The flyover is assumed to be constructed in the 2014 timeframe.

Six alternatives were proposed and analyzed in an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the proposed project. There are four build alternatives, one Transportation System Management (TSM) alternative, and one No Build alternative. Alternative 3 (Bridge Avoidance) in the EIS/EIR is essentially equivalent in terms of traffic as Alternative 1, and Alternative 4 (Bridge Only) is also equivalent (in terms of traffic) to the No Build alternative.

Therefore, only two alternatives are considered in detail in this HRA, and are as follows:

- Alternative 1: Bridge Replacement and Expressway
- Alternative 2: SR-103 Extension to Alameda Street

The impacts and benefits of the remaining alternatives can be further evaluated using the results of this analysis.

1.2.1 Alternative 1: Bridge Replacement and Expressway

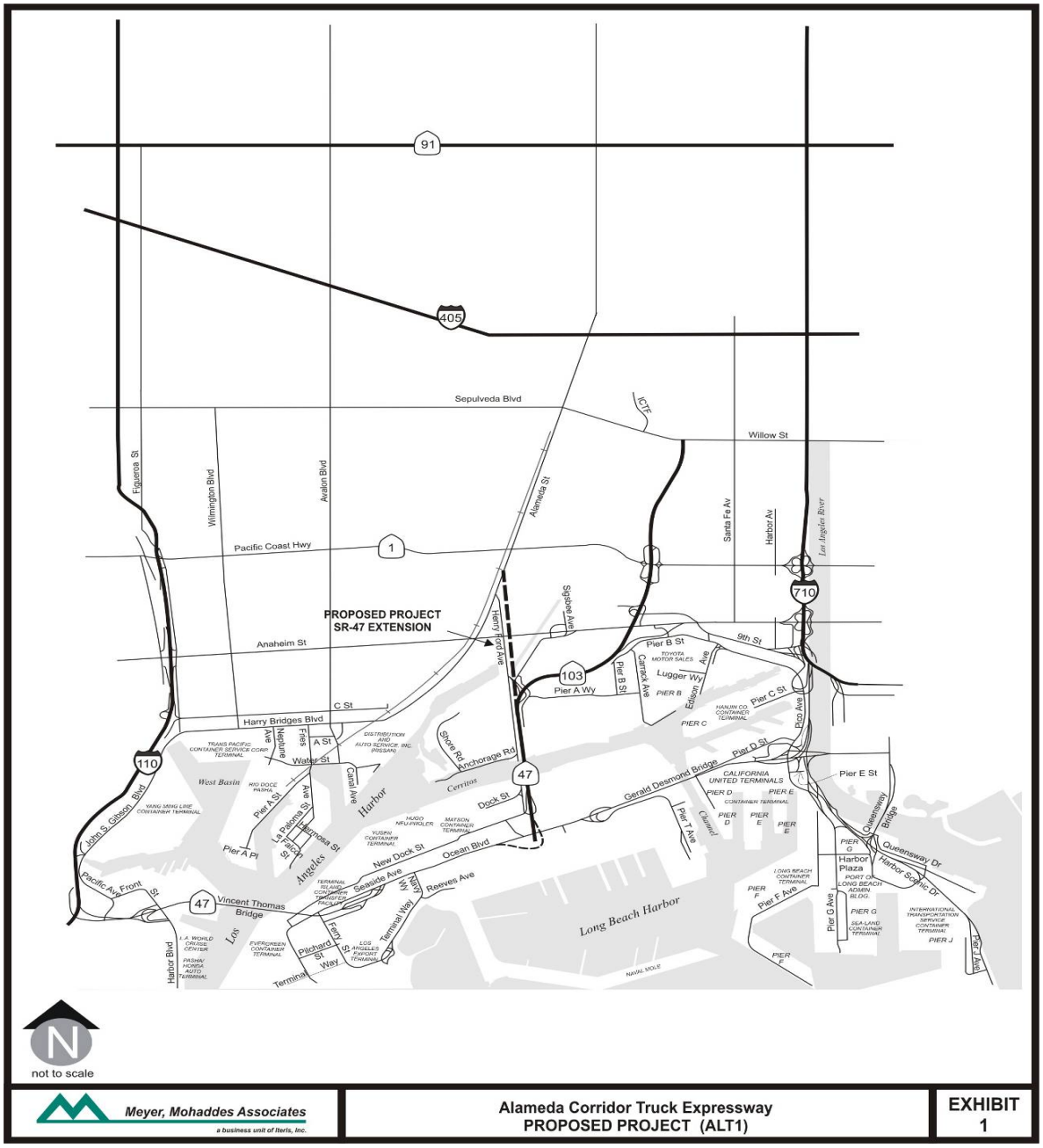
This alternative (see Figure 1-1) would replace the existing Schuyler Heim Bridge to meet current seismic criteria and provide an elevated through-lane (Ocean Boulevard/SR-47 flyover) from eastbound Ocean Boulevard onto northbound SR-47. A new SR-47 Expressway would also be

constructed to provide a high-capacity alternative route along the Alameda Corridor for traffic between Terminal Island and Alameda Street, south of Pacific Coast Highway.

With this alternative, a new fixed-span bridge would be constructed, primarily within the existing bridge right-of-way, but toward the east to avoid impacts to the railroad on the Badger Avenue Rail Bridge immediately to the west; the existing Schuyler Heim Bridge (a lift bridge) would be demolished. The replacement bridge would be slightly wider than the existing bridge due to the addition of standard shoulders, which are not present on the existing bridge; however, this widening would not increase the number of travel lanes.

The new SR-47 Expressway would begin on Terminal Island, at the intersection of SR-47 and Ocean Boulevard, extending north over New Dock Street and onto the Schuyler Heim Bridge replacement. A new northbound on-ramp would be constructed from New Dock Street, and a new southbound off-ramp would be constructed to New Dock Street, as described above. The expressway would extend northward to Alameda Street, south of the intersection with Pacific Coast Highway, a distance of approximately 2.7 kilometers (km) (1.5 miles [mi]). The expressway would be an elevated, four-lane, limited access roadway. It would grade-separate five of the existing at-grade railroad crossings and three signalized intersections along its length. A segment of the expressway would be constructed as an elevated viaduct over Henry Ford Avenue and Alameda Street and return to grade at Alameda Street, just south of Pacific Coast Highway. Under this alternative, connectivity to SR-103 would be maintained.

Figure 1-1. Alameda Corridor Expressway Proposed Project, Alternative 1



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Alameda Corridor Truck Expressway
PROPOSED PROJECT (ALT1)

EXHIBIT 1

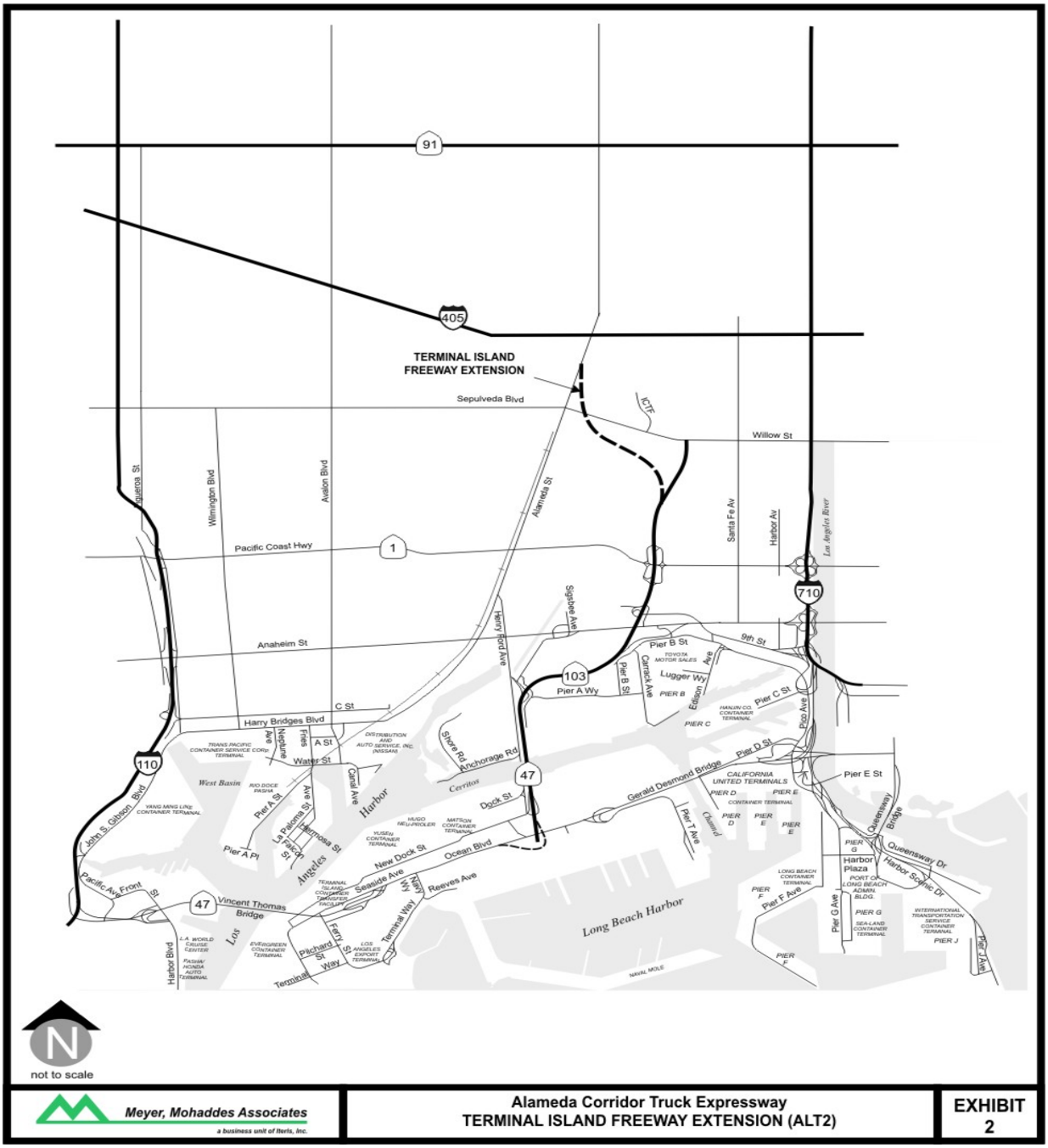
The Ocean Boulevard/SR-47 flyover will be a two-lane, elevated structure to divert traffic bound for northbound SR-47 directly onto the new bridge from eastbound Ocean Boulevard. The purpose of the flyover is to enable this traffic to avoid the signalized Ocean Boulevard/SR-47 intersection. Under Alternative 1, the flyover will begin on Terminal Island, about 1,200 m (3,900 ft) west of the Ocean Boulevard/SR-47 intersection, extend eastward along the south side of Ocean Boulevard, then turn north, cross over Ocean Boulevard and onto the new bridge.

1.2.2 Alternative 2: SR-103 Extension to Alameda Street

With this alternative (see Figure 1-2) the existing Schuyler Heim Bridge would be demolished and a new fixed-span bridge and flyover would be constructed, as described under Alternative 1. With this alternative, the right lane of the flyover would continue to SR-103 after crossing the new bridge. Additionally, modifications to the northbound and southbound approaches to the bridge would be constructed.

This alternative also would extend SR-103 to the northwest on a four-lane elevated viaduct to join Alameda Street between Sepulveda Boulevard and I-405. Improvements to SR-103 would begin approximately 3.2 km (2 mi) north of the Schuyler Heim Bridge and extend a distance of approximately 2.6 km (1.6 mi). The elevated viaduct would cross over the Union Pacific Railroad manual yard and San Pedro Branch, through the Southern California Edison (SCE) utility corridor, across the Los Angeles Harbor Department Warehouse 16/17 area, over Sepulveda Boulevard, and then parallel the western boundary of the Intermodal Container Transfer Facility (ICTF) to the centerline of Alameda Street. The viaduct would slope to grade south of the Wardlow Road ramps to I-405.

Figure 1-2. Alameda Corridor Expressway Terminal Island Freeway Extension, Alternative 2



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Alameda Corridor Truck Expressway
TERMINAL ISLAND FREEWAY EXTENSION (ALT2)

EXHIBIT 2

2.0 METHODOLOGY

Chapter 2 outlines the methodology by which emission inputs were characterized, air dispersion models were employed, and health risk estimates were calculated for each alternative.

2.1 Emissions Calculations

2.1.1 Source Categories and Assumptions

The health risk assessment for the project included the following categories of mobile sources in the project area:

- Port Trucks
- Regional Trucks
- Automobiles (both Port and Regional)

Port trucks are comprised of bobtail, chassis, and container trucks used to haul goods into and out of the Ports of Los Angeles and Long Beach. For emissions characterization purposes, 100 percent of the port trucks were assumed to be Heavy Heavy Duty (HHD) Trucks. For existing conditions (2003) and until the year 2007, it is assumed that all of the HHD Port trucks are diesel-fueled. After 2007, the Port truck fleet begins to experience changes due to the implementation of the Ports Clean Air Action Plan (CAAP), and specifically the Port Clean Truck Program, with the goal of eliminating "dirty trucks" from the fleet and regional roadways. Specific commitments of the CAAP (the Port Clean Truck Program) were incorporated into the Port truck fleet profiles in this HRA to capture these important improvements in the project build-out years 2015 and 2030 (personal communication, Chris Patton, Port of Los Angeles, February 2008):

- 100 percent of trucks entering the Port by January 1, 2012 will meet the 2007 federal clean truck standards.
- 16,800 individual diesel-powered short-haul (drayage) trucks, which represent 80 percent of truck calls, will be replaced or retrofitted with the assistance of a Port-sponsored grant/subsidy.
- Port replacement/retrofit programs will encourage alternatively fueled vehicles. Half of the 16,800 drayage trucks will be replaced with alternatively fueled liquefied natural gas (LNG) trucks by January 1, 2012.

The CAAP emission reductions as described above were not discounted in terms of effectiveness for two reasons: 1) all measures are supported by firm commitments on behalf of both ports[2]; 2) the SCAQMD is currently collaborating with the ports on a rulemaking process for "backup" measures should these programs fall short of their goals[3].

In addition to the Ports' Clean Truck Program assumptions, the remaining portion of the medium heavy duty (MHD) and heavy heavy duty (HHD) truck fleet was assumed to be in compliance with the California Air Resources Board "On-Road Heavy Duty Diesel Vehicles Regulations" which are anticipated to be approved in December of 2008. Under these regulations, both MHD and HHD trucks would have emissions to meet the standards for model year 2003 engines or better by 2015, and model year 2007 or better by 2017.

In 2015, the diesel truck emissions factors for DPM were assumed to be reduced by an additional 10% to account for two AB32 discrete early action measures, the low carbon fuel standard (LCFS) and the SmartWay truck fuel efficiency program. These discrete early action measures are scheduled to be adopted by CARB and enforceable by 2010. 10% reduction of DPM emissions represent the lower limit of the reduction targets under these measures and is therefore considered a conservative emission estimate approach.

In 2030, it was assumed that reductions of 35% of DPM would be achieved for regional and Port diesel trucks. This reduction would come from a combination of LCFS, increased fuel efficiency, and vehicle hybridization strategies outlined in CARB's draft scoping plan for AB32. The 35% reduction is based on the assumption that 100% of the remaining trucks would use biodiesel as an alternate fuel. Biodiesel produces on the average 35% less particulate matter emissions than conventional diesel fuel. The particulate matter emitted from biodiesel combustion is significantly less carcinogenic than diesel particulate matter from conventional diesel combustion. Biodiesel was used as a worst-case assumption to account for implementation of the AB32 alternate fuels program. Alternate fuels provisions of AB32 are most likely to result in the use of a variety of fuel types with higher percentage reduction in DPM than biodiesel.

[2] May 15th 2007, Los Angeles Board of Harbor Commissioners, Clean Truck Program Concession Agreement
[3] San Pedro Bay CAAP, FAQs, http://www.polb.com/faqs

2.1.2 Emission Factors

Emission factors of diesel particulate matter (DPM) and total organic gases (TOG) from gasoline and diesel-fueled vehicles (Port trucks, regional trucks and automobiles) were estimated using the California Air Resources Board (CARB) EMFAC2007 mobile emissions modeling program.

Diesel Truck DPM and TOG emissions were speciated using the California Air Resources Board (CARB) profiles, included in Appendix A. Speciation from gasoline exhaust was limited to the Mobile Source Air Toxics (MSAT) pollutants acrolein, acetaldehyde, 1-3 butadiene, benzene, and formaldehyde. The TOG speciation factors for gasoline vehicles were identified and taken from the most recent Caltrans inventory tool for MSATs (UC Davis, 2006).

Emission factors for LNG trucks were estimated using a methodology similar to that used in conventional diesel and gasoline engines in EMFAC2007. These calculations utilize a “zero-mile” or base emission rate for brand-new LNG truck engines and then incorporate a mileage deterioration factor for emission rates in future years as the truck fleet ages. South Coast Air Basin (SCAB) fleet data was used to determine accumulated heavy duty truck mileage for each year over a truck’s life. Using those yearly mileage estimates, LNG exhaust emission factors were adjusted to account for deterioration in performance over time (details of these calculations are included in Appendix B). It was assumed that all Port LNG trucks on the roadways in years 2015 and 2030 were purchased through the Port’s current Clean Trucks Program and are limited to the model years associated with the program implementation phase (2008 - 2011). Since the Port’s commitment to truck retrofit ends in 2011, it is assumed that no new LNG trucks are introduced after 2011, and the LNG truck trips for 2015 and 2030 are identical for the purpose of this HRA. The non-retrofitted port trucks and SCAB trucks are assumed to be compliant with the AB32 early action measures in 2015, and would be retrofit with a variety of alternate fuels in 2030 (see Section 2.1.1 for details).

2.1.3 Emission Rates and Traffic Forecast

Maximum Short-term Emissions

Maximum hourly emissions were estimated using peak hourly traffic projections from the traffic study for each roadway segment. Peak hourly traffic data for both regional and Port trucks were selected from the midday (MD) time period when the hourly truck volumes are the highest. Peak

hourly automobile data was taken from the PM time period that corresponds to the highest traffic volumes for automobiles. This conservative approach ensures that maximum short-term traffic impacts are captured by the health risk assessment modeling.

Average Annual Emissions

Annual average emission rates were developed for project years 2003, 2015, and 2030 based on average daily traffic (ADT) counts for project and regional roadways. Traffic volumes and average daily traffic (ADT) were developed using information from the Ports and from SCAG. The Port of Long Beach/Port of Los Angeles transportation model (see Meyer Mohaddes Traffic Study [ACET, 2007]) was utilized to develop traffic volumes and ADT for port-related traffic. The 2003, 2015, and 2030 daily port truck trips were split into four time periods, as defined by SCAG, as follows: AM (6 am - 9 am), MD (9 am - 3 pm), PM (3 pm - 7 pm), and Night (7 pm - 6 am). Trip tables were then generated for port autos, bobtails, chassis, and containers for the four time periods.

The SCAG 2004 Regional Transportation Plan (RTP) model was used to develop traffic volumes and ADT for non-port related traffic (see Meyer Mohaddes Traffic Study [ACET, 2007]). The non-port related traffic data, including regional Drive Alone (DA), High Occupancy Vehicles (HOVs), High Occupancy Vehicles 2+ (HOV2+), Light-Heavy Duty (LHD) trucks, Medium Heavy Duty (MHD) trucks and Heavy-Heavy Duty (HHD) trucks, was compiled for the four time periods and incorporated into trip tables.

The port and regional non-port related trip tables were combined for the purpose of the highway traffic assignment. Each trip table contains the following 10 types of vehicles:

- SCAG DA
- SCAG HOV
- SCAG HOV2+
- Port Autos
- SCAG LHD Trucks
- SCAG MHD Trucks

- SCAG HHD Trucks
- Port Bobtails
- Port Chassis
- Port Containers

To determine the ADT volumes, highway traffic assignment was performed for each time period using the SCAG highway assignment methodology. Traffic pattern flow diagrams illustrating the ADT volumes for each vehicle class by segment used in the inventory and dispersion modeling effort are provided in Appendix C. The emission inventory and subsequent air dispersion modeling included the project alignment as well as affected regional freeways and local arterials as follows:

- SR-47 Alignment
- SR-103 Alignment
- I-110 from "C" Street Interchange to SR-91
- I-710 from Anaheim to SR-91
- Harry Bridges Boulevard
- Alameda Boulevard to SR-91
- Pacific Coast Highway (SR-1)
- Sepulveda Blvd/Willow St from I-110 to SR-103
- Del Amo Blvd from I-110 to I-710
- 223rd Street / W. Wardlow from I-110 to I-710

2.1.4 Emission Scenarios

For cancer risk analysis, two emission scenarios were included in the HRA, one based on 70-year average emissions and the other one based on 2015 emissions.

70-Year Average Emissions Scenario:

For the purpose of cancer risk analysis, the exposure period was assumed to be 70 years during the period from 2003 through 2072. The 70-year average emissions were derived by linearly interpolating between years 2003 to 2015, and from 2015 to 2030. After 2030, emissions factors were assumed to be constant at 2030 levels due to lack of data on further regulatory drivers for future pollution reduction. The interpolated emissions for the individual years in each range were averaged over the entire 70-year period. The 70-year long term average emissions are composed of 12 years of no net increase in project emissions (because the project will not be in place until 2015), 15 years of reasonably foreseeable incremental project emissions (2016 though 2030), and 43 years of estimated incremental project emissions at 2030 levels (2031 though 2072), when the ports achieve their maximum physical capacity. Details and tables of emissions for the 70-year average emission rates are included in Appendix B, Tables B25-B32.

The cancer risks of the 70-year average emissions scenario are likely overestimated due to the conservative assumptions used in the analysis. The analysis used traffic projections and reasonably anticipated regulatory programs up to the year 2030. Beyond 2030 project emissions are estimated and may not 1) be reflective of the economic conditions of the time, 2) realize future technological advances or 3) account for promulgation of additional regulations for diesel risk or greenhouse gas emissions reduction purposes. The 70-year average emissions scenario is considered overly conservative for the following reasons:

- The traffic growth assumptions are ambitious and may be overestimated because they do not account for fluctuations in the economy which affect traffic conditions. Additionally the potential traffic decrease due to future diversion of cargo to other ports or to water service was not considered.
- It is highly likely that over the next 70 years additional regulations will be adopted mandating increasingly stringent motor vehicle emissions standards that will substantially reduce emissions profiles. The analysis only took into account currently adopted and reasonably anticipated regulations and did not attempt to predict what additional future regulations might require. However based on current and past air quality regulatory

programs, it is reasonable to consider that additional increasingly stringent vehicle emission standards will be implemented.

- The 70-year average emissions scenario did not consider the emergence of new technology for goods movement transport aimed at reducing vehicle traffic and combustion emissions, although it can be anticipated that technology will improve over the next decades and that emission profiles will be substantially reduced.

2015 Emissions Scenario:

The 2015 emissions scenario of the HRA used 2015 emissions throughout the entire 70-year exposure period. Given the uncertainties discussed above for the 70-year analysis, this scenario was used as the preferred scenario in the HRA for purposes of significance evaluation and subsequent mitigation strategy development.

- The 2015 emissions scenario was performed to address the uncertainties related to the future years emissions associated with the 70-year average emissions scenario. The assessment utilizing the 2015 emissions scenario evaluated the risks over a 70-year period, incorporates only regulations that are already promulgated or reasonably foreseeable emission reduction regulations and does speculate as to future traffic increases or regulatory programs. The analysis assumes that in 2015, the Ports Clean Truck Program and California Air Resources Board (CARB) heavy duty truck regulations are in place. The resulting 2015 risk was projected over 70 years to obtain lifetime cancer risk estimates. The analysis, based on 2015 conditions was utilized as the most likely future risk condition. A full discussion of the unknowns justifying the choice of this scenario as preferred is provided in Section 3.2.2.

Acute and Chronic Emission Scenario

For acute and chronic risk analysis, maximum hourly and annual average emissions were estimated for each of the project years of 2003 (baseline), 2015 and 2030. Detailed tables of emissions for the project baseline, 2015, and 2030 are included in Appendix B, Tables B1-B24.

2.2 Air Dispersion Modeling Approach

2.2.1 Modeling Assumptions

Roadway paths were developed for roads within the study area. The roads used in the air dispersion modeling included existing roadways as well as new alignments to be constructed as part of the Project Alternatives. Roadway alignments, widths, and elevations were determined using engineering drawings, Geographic Information Systems (GIS) layers, and aerial orthophotos.

Volume source representations of the roadways were developed based on roadway configurations and assumed vertical dimensions for both auto and truck traffic. Roadway volume source spacings were determined based on road widths. The initial release heights relative to the road bed were 15 feet for trucks and 3 feet for automobiles. The truck release height was selected for consistency with recent HRAs prepared for the Port of Los Angeles (TraPac [Port of Los Angeles, 2007]), and the auto release height was based on AERMOD guidance and a 6-foot vertical extent (based on assumed automobile wake height) (TraPac, [Port of Los Angeles, 2007]). For both at-grade and elevated roadways, the final modeled release height was calculated relative to terrain elevation at the receptor location.

Initial vertical and horizontal standard deviations for volume sources (σ_{y0} and σ_{z0}) were based on guidance contained in Table 3-1 of the AERMOD User's Guide (USEPA, 2004). The initial horizontal dimensions (σ_{y0}) are equal to the source separation divided by 2.15. All sources were considered to be surface-based, with initial vertical dimensions (σ_{z0}) equal to the vertical source extent (i.e., vehicle height) divided by 2.15. Although some roadways modeled are in fact elevated roadbeds, the initial dilution of the exhaust plume, which is represented by σ_{y0} and σ_{z0}, was considered to be identical for both at-grade and elevated roadways due to the similar widths of the elevated road beds compared to the widths of the actual traffic lanes.

All sources were modeled as urban sources within AERMOD. For urban sources, the AERMOD model inputs require the population of the urban area in order to estimate the magnitude of urban heat island effects. A population of 664,078 was utilized as representative of the local Los Angeles - Long Beach area, consistent with recent Port of Los Angeles HRAs (POLA, 2007).

2.2.2 Model Description

The AERMOD model was used to estimate annual average and maximum hourly ground level concentrations of pollutants, in units of micrograms of pollutant per cubic meter of air ($\mu g/m^3$). The annual average concentration is appropriate for estimating chronic, long-term exposure to pollutants. The maximum 1-hour concentration is a conservative value for use in estimating acute, short-term exposures.

For compatibility with the risk assessment model (HARP, described in Section 2.3), the road segments in AERMOD were each modeled with a unit emission rate of 1 gram per second (g/s). Each roadway segment was modeled in AERMOD as a separate source group and a total emission rate of 1.0 g/s (e.g., the modeled emission rate of each source in a segment represented by 10 volume sources would be 0.1 g/s). Since the dispersion factor for a single source remains constant for any pollutant emitted, ground level concentrations of any pollutant (in $\mu g/m^3$) can readily be calculated by multiplying the actual source strength for the pollutant (in g/s) by the dispersion factor (i.e., $(\mu g/m^3)/(g/s) \times (g/s) = \mu g/m^3$).

The air dispersion modeling used current USEPA preferred regulatory air dispersion model AERMOD with 12 consecutive months of meteorological data from September 2006 through August 2007. The raw meteorological data was collected at the St. Peter and Paul School by SCAQMD, and was pre-processed for AERMOD by the Port of Los Angeles using the latest USEPA guidance. The St. Peter and Paul School dataset was selected for its proximity to the project area as well as its acceptability for use in similar regional modeling efforts inland of Port operations.

Terrain elevations were determined for all sources and receptors using the AERMAP terrain preprocessor and United States Geologic Survey (USGS) Digital Elevation Model (DEM) data.

2.2.3 Receptor Grid

Receptors were deployed on two main receptor grids covering the roughly 9-km x 14-km region surrounding the project. Both a coarse regional grid and a refined sensitive receptor network were created. The domain covered by the grids was defined based on proximity to roadways and the nature of land use in potentially affected areas along the alignment. Figure 2-1 illustrates the definition of the modeling domain. The coarse grid was used to depict regional trends in health

effects and the refined grid to more extensively scrutinize health effects on local schools, parks and residential neighborhoods.

The coarse regional network included 1,563 receptors at 400- and 200-meter spacing over the entire 9-km x 14-km region. The 200-meter spacing receptors were distributed over the regions within 800 m of the modeled roadways in the main project corridor (existing and proposed). Figure 2-2 shows the receptor locations for the regional network.

The refined network of 2,823 receptors covered sensitive land use areas at 50 or 100-meter spacing. Sensitive land use areas in the domain were identified based on 2001 SCAG land use data for the following categories: residential, primary and secondary schools, parks, and marinas (which were assumed to be residential live-aboard marinas). The 50-meter receptors were focused within 800 meters of the modeled roadways in the main project corridor, and the 100-meter receptors covered the region extending from 800 meters to 2 kilometers from the roadways. Figure 2-3 shows the sensitive receptor network as grid cells. The actual receptor points modeled reside in the center of each cell. AERMOD modeling files are provided in Appendix F of this report.

2.3 Risk Assessment Approach

The HRA was performed following the latest guidance outlined in the "*Air Toxics Hot Spots Program Risk Assessment Guidelines*" (California Office of Environmental Health Hazard Assessment (OEHHA), August 2003.) The CARB Hotspots Analysis and Reporting Program (HARP), Version 1.4a, along with the HARP On-ramp program (Version 1.0), was used for HRA modeling. The HARP On-Ramp tool was used to import the AERMOD air dispersion modeling results (predicted concentrations at specific locations) into the HARP Risk Module. The HARP Risk Module predicts health impacts in terms of cancer risk, acute hazard index (HIA), and chronic hazard index (HIC) by factoring AERMOD-predicted pollutant concentrations by pollutant-specific cancer potency values and chronic /acute reference exposure levels (RELs) obtained from OEHHA (CARB, 2008).

Following the OEHHA guidance and SCAQMD guideline, the HRA included potential health impacts from homegrown produce, dermal absorption, soil ingestion, and mother's milk. In

addition, because inhalation is the dominant pathway of cancer risks, the Derived (Adjusted) Method in HARP was used for the cancer risk evaluation based on *Recommended Interim Risk Management Policy for Inhalation-Based Residential Cancer Risk* (CARB, 2003).

The incremental health risk increases due to the project were compared to SCAQMD health risk thresholds adopted by City of Los Angles. By definition, CEQA health risk thresholds apply to incremental increase due to project emissions, and the significance level would be based on the health risk increases, not the absolute health risk values. The project is not directly responsible for toxic emissions and health risks related to existing traffic volumes, just the changes in emissions in specific roadway segments associated with improved infrastructure constructed as part of the project.

Figure 2-1. Definition of Modeling Domain

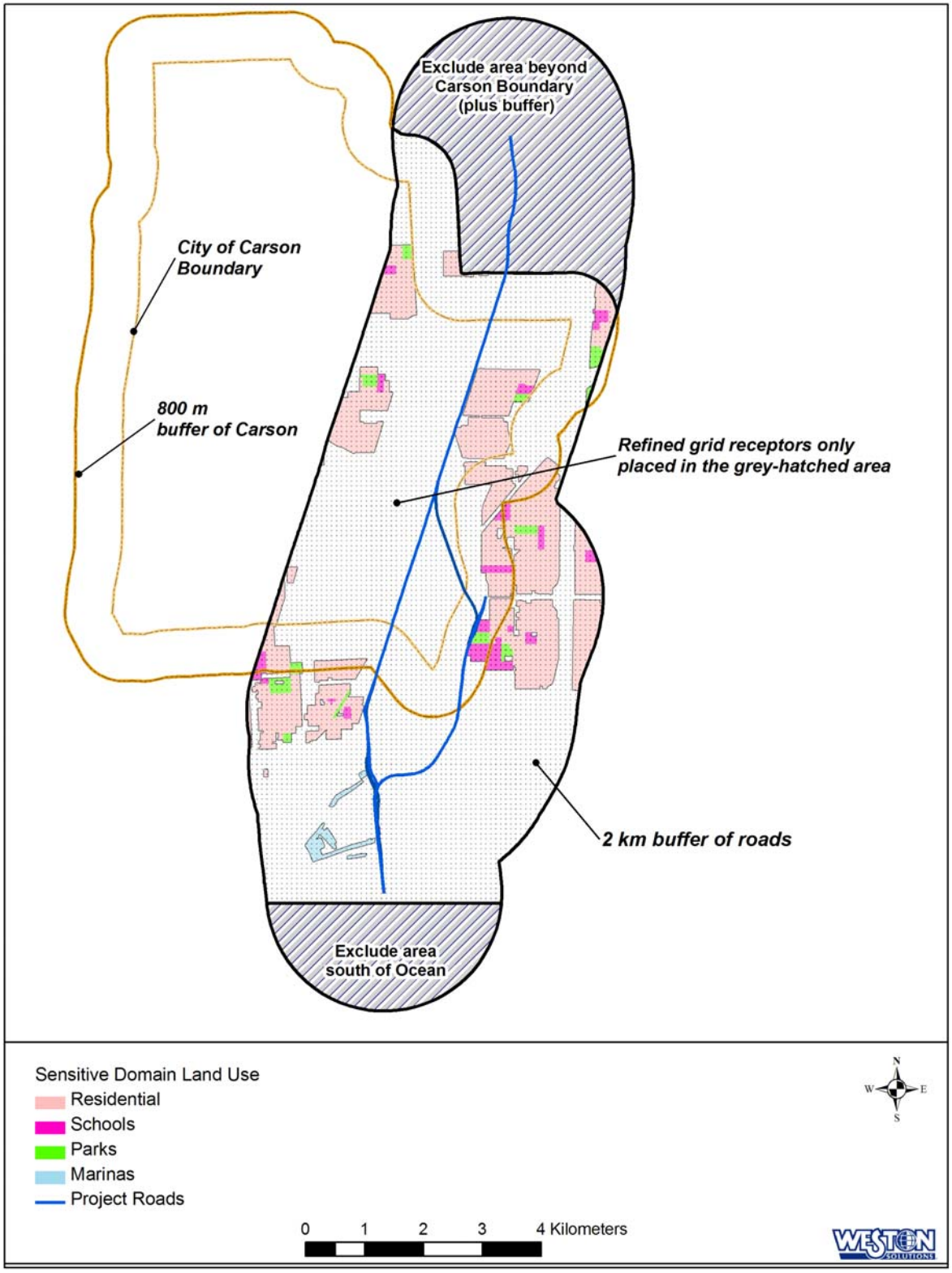


Figure 2-2. Regional Modeling Grid Receptors

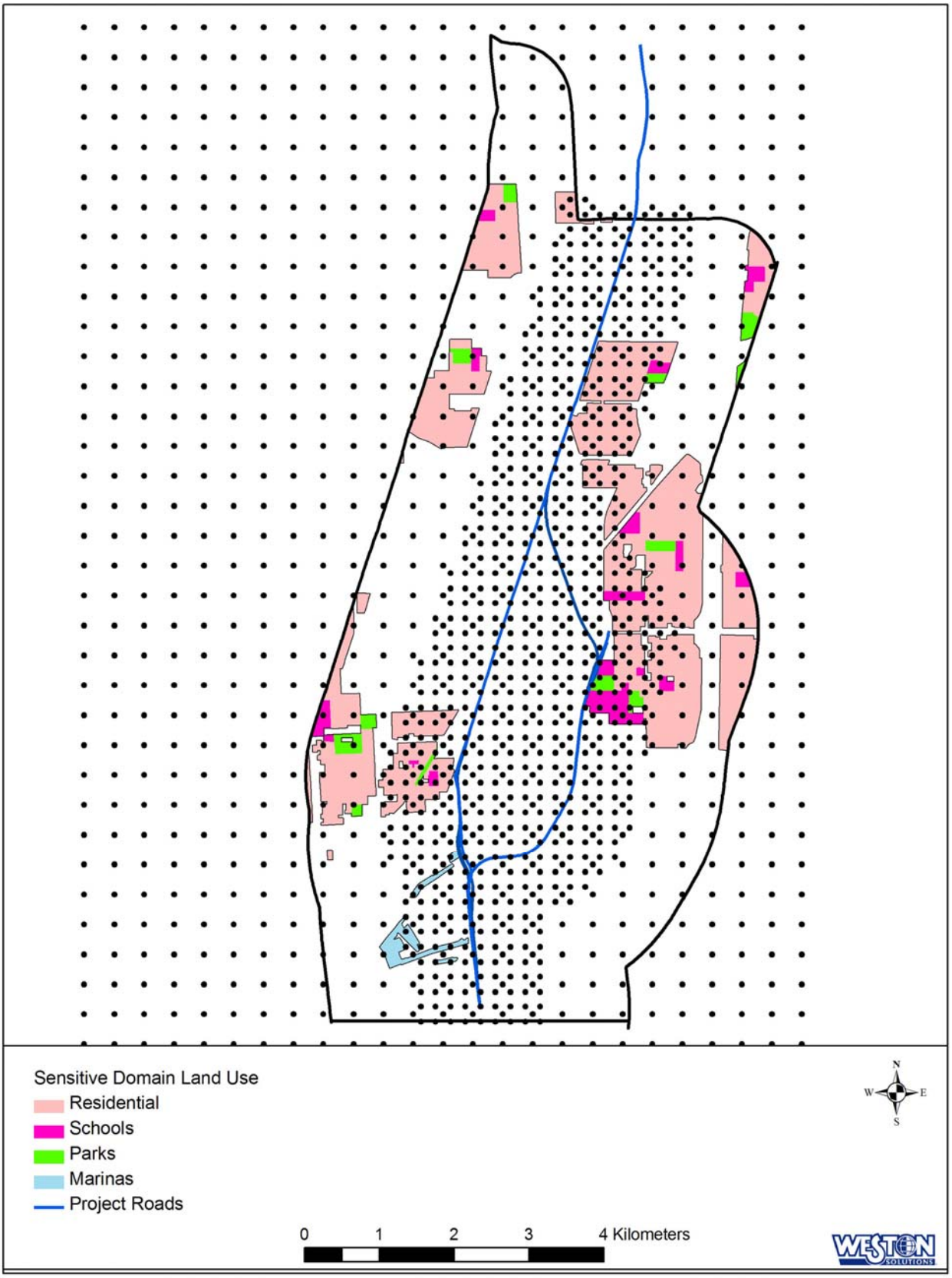
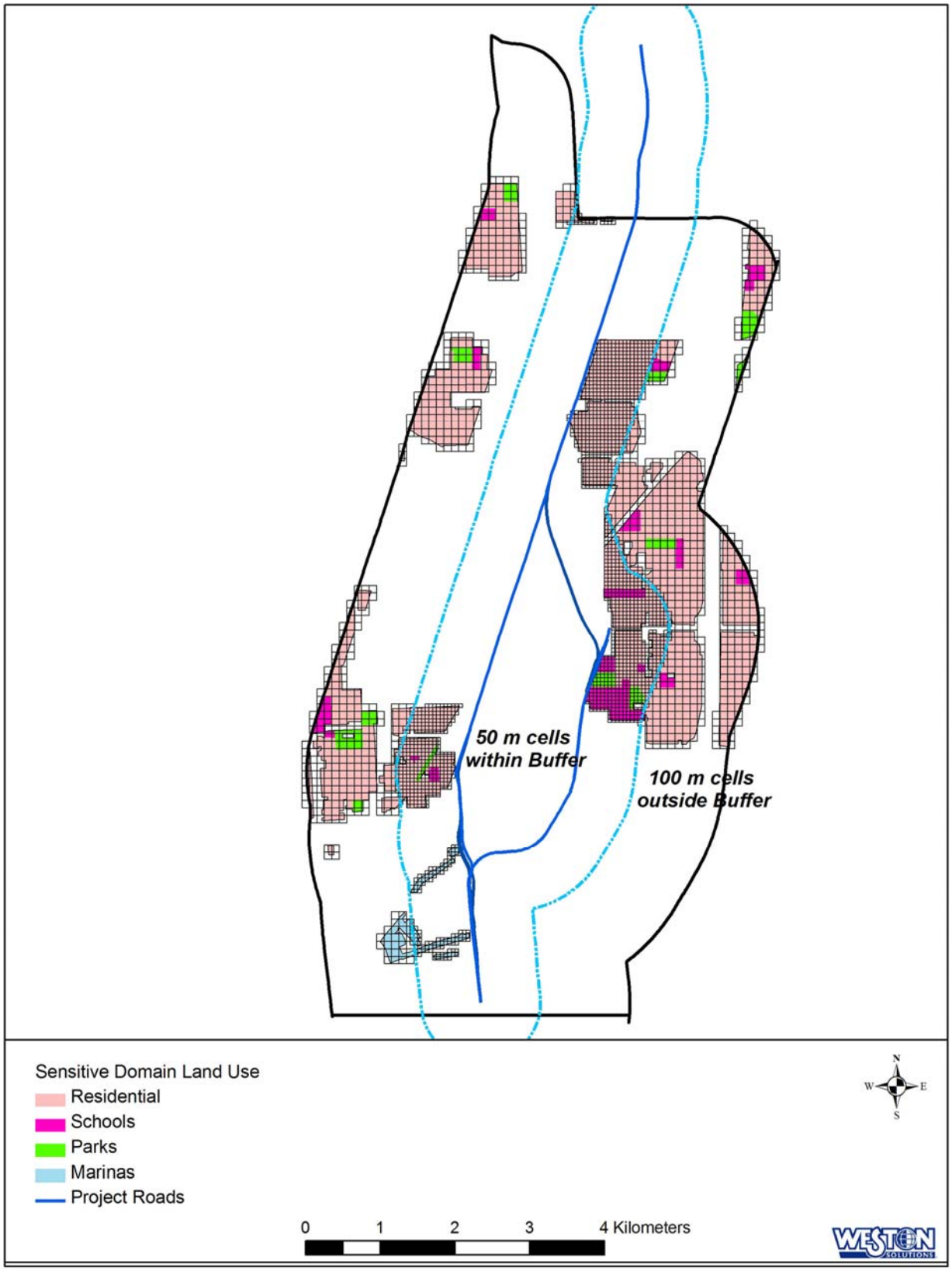


Figure 2-3. Refined Modeling Grid Receptors



2.3.1 Cancer Risks

The inhalation cancer potency factor is the probability that a person will contract cancer from the continuous inhalation of 1 milligram (mg) of a chemical per kilogram (kg) of body weight per day over a period of 70 years. The inhalation potency factor is used to calculate a potential inhalation cancer risk using the new risk assessment algorithms defined in the OEHHA 2003 guidance. The risks are expressed as a dimensionless fraction, usually presented as chances per million of developing cancer. Cancer risk from diesel trucks were evaluated by quantifying and evaluating the emissions of diesel exhaust particulate matter. The cancer risk from gasoline-fueled cars and trucks were evaluated by speciating the organic exhaust stream using the Caltrans profile for the gasoline MSAT pollutants which includes acetaldehyde, benzene, 1,3-butadiene, and formaldehyde. The cancer risks contributed from LNG trucks are evaluated based on the combustion emissions of diesel component (as DPM) and from the speciated TOG and other PM components of the exhaust. The speciation profiles used for LNG truck exhaust and the detailed assumptions are included in Appendix A.

A summary of the toxic compounds included for cancer risk analysis is presented in Table 2-1. The emissions of the individual chemicals for each vehicle category are also included in the emission calculations in Appendix B.

Table 2-1 Compounds Analyzed for Cancer Risks

Vehicle Type	**Carcinogenic Compounds Evaluated**
Diesel Trucks	DPM
Gasoline Cars and Trucks	Benzene, 1-3 Butadiene, Acetaldehyde, Formaldehyde
LNG Trucks	DPM, Chromium, Nickel, Benzene, Acetaldehyde and Formaldehyde.

2.3.2 Non-Cancer Risks

To assess the potential for non-cancer health effects resulting from chronic and acute inhalation exposure, OEHHA has established Reference Exposure Limits (RELs) to which short-term and annual ambient TAC concentrations are compared. An REL is an estimate of the continuous inhalation exposure concentration to which the human population (including sensitive subgroups) is likely to be exposed without appreciable risk of experiencing deleterious non-cancer effects. The comparison is done as a ratio of the ambient concentration to the REL, referred to as a Hazard Index (HI).

Chronic health effects were calculated based on speciated annual average emissions for the project years 2015 and 2030. Chronic impacts of diesel trucks were evaluated using diesel exhaust particulate matter. Chronic health effects from components of gasoline exhaust were evaluated for the MSAT pollutants with OEHHA established chronic RELs for: acetaldehyde, acrolein, benzene, 1,3-butadiene, and formaldehyde. Similar to the cancer risk analysis, chronic health effects for the components of LNG exhaust were evaluated by considering the diesel component as DPM and speciating the TOG and PM exhaust streams from LNG combustion using ARB profiles for compounds with OEHHA established chronic RELs. The speciation profiles and list of chemicals is described in detail in Appendix A.

Acute health effects were calculated based on speciated maximum peak hour emissions for the project years 2015 and 2030. Acute impacts of diesel truck emissions were evaluated using speciation profiles for both the organic and particulate component of the diesel exhaust streams, since there are no established OEHHA acute RELs for diesel exhaust. Acute health effects from components of gasoline exhaust were evaluated for the MSAT pollutants with OEHHA established acute RELs: acrolein, benzene and formaldehyde. Acute health effects for the LNG exhaust were evaluated by speciating the DPM component of the exhaust as well as the TOG and other PM exhaust from LNG combustion using CARB profiles for compounds with OEHHA established acute RELs. The speciation profiles and list of chemicals included in the analysis are included in detail in Appendix A.

2.3.3 Health Risk Assumptions

For the cancer and non-cancer chronic health risk evaluations, the frequency and duration of exposure to TACs are assumed to be directly proportional to the risk. Therefore, this HRA used specific exposure assumptions for each receptor type, as described below.

1) ***Residential and Sensitive Receptors*.** Because inhalation is the dominant pathway of cancer risks, cancer risks for residential and sensitive receptors were estimated based on CARB's Interim Policy for Inhalation-Based Residential Cancer Risk using the "Derived (Adjusted)" risk calculation method assuming an exposure duration of 24 hours per day, 350 days per year over 70 years. Given the temperate nature of the climate, no reduced exposure duration was assumed for periods residents would be indoors. This methodology incorporates the derived cancer risk method outlined in the most recent OEHHA HRA guidance (OEHHA, 2003) together with the 80th percentile breathing rate of 302 liters per kilogram of body weight per day (L/kg-day) (CARB, 2003).

2) ***Occupational Impacts.*** Occupational cancer risks were estimated based on an exposure duration of 8 hours per day, 245 days per year for 40 years (as recommended by OEHHA [2003]). Occupational cancer risks were calculated outside of HARP by applying the adjustment ratio of occupational exposure to residential exposure. The breathing rate for workers is equal to 447 L/kg-day. The risk values predicted for residents, therefore, were multiplied by (447/302) x (8 x 245 x 40)/ (24 x 350 x 70) = 0.1974 to produce the maximum occupational cancer risks expected from the Project.

3) ***Student Impacts.*** Populations at school sites include teachers/staff and students. Both groups are exposed for less than a 70-year lifetime and are also evaluated accordingly. Student/staff cancer risk was assessed using the worker occupational exposure scenario described above. Student exposure is based on an exposure of 6 hours per day, 180 days per year and 13 years. The 13-year exposure duration encompasses the entire K-12 grade span and conservatively allows for scenarios where a student may be exposed to similar levels of risk at several schools clustered in a geographical area. Cancer risks for student receptors were scaled from predicted workers cancer risks. The high-end

breathing rate for children is equal to 581 L/kg-day (OEHHA, 2003). The worker cancer risk values predicted at school sites, therefore, were multiplied by (581/447) x (6 x 13 x 180) / (8 x 245 x 40) = 0.233 to produce the maximum student risks. As supplemental information, the cancer risk values assuming a full 70 years of exposure for students, as SCAQMD recommended, are also reported in this HRA.

4) ***Recreational User Impacts.*** Because HARP does not directly compute risks for recreational exposure assumptions, risks for recreational receptors were scaled from the results for workers. Based upon an assumed maximum recreational activity rate of 2 hours per day, 350 days per year for 70 years, this exposure time produces an adjustment factor of (2 × 350 × 70)/(8 × 245 × 40). This factor is further modified to account for differences in the breathing rate of a person engaged in recreation compared to a worker breathing rate. The breathing rate during recreation is assumed to be a "heavy-activity" rate equal to 1,097 L/kg-day, which was obtained from the USEPA *Exposure Factors Handbook* (USEPA, 1997). The workers risk values predicted in recreation areas, therefore, were multiplied by (0.63 × 1,097/447) = 1.5 to produce the maximum recreational user risks expected from the Project.

2.4 Conservative Nature and Uncertainties of HRA

By their nature, risk assessments are intended to be predictions of risk. Scientists, medical experts, regulators, and practitioners do not completely understand how toxic air pollutants harm human cells or how different pollutants might interact with each other in the human body. The exposure assessment often relies on computer models that are based on a multitude of assumptions, both in terms of present and future conditions.

When information is missing or uncertain, risk analysts generally make assumptions that tend to prevent them from underestimating the potential risk. These assumptions provide a margin of safety in the protection of human health and are very conservative. For example, most people do not stay in one place for 24 hours a day, 350 days a year and 70 years; yet the assumption is used in predicting residential risk.

Additionally, there is no single universal way of doing health risk assessments, leading to possible problems in comparing different risks. Assumptions also change over time, and even HRAs completed using the same models can produce different results, if the inputs differ.

OEHHA has provided a discussion of risk uncertainty, which is reiterated here (OEHHA, 2003): *There is a great deal of uncertainty associated with the process of risk assessment. The uncertainty arises from lack of data in many areas necessitating the use of assumptions. The assumptions used in these guidelines are designed to err on the side of health protection in order to avoid underestimation of risk to the public. Sources of uncertainty, which may either overestimate or underestimate risk, include: 1) extrapolation of toxicity data in animals to humans, 2) uncertainty in the estimation of emissions, 3) uncertainty in the air dispersion models, and 4) uncertainty in the exposure estimates. Uncertainty may be defined as what is not known and may be reduced with further scientific studies. In addition to uncertainty, there is a natural range or variability in the human population in such properties as height, weight, and susceptibility to chemical toxicants. Scientific studies with representative individuals and large enough sample size can characterize this variability.*

Interactive effects of exposure to more than one carcinogen or toxicant are also not necessarily quantified in the HRA. Cancer risks from all emitted carcinogens are typically added, and hazard quotients for substances impacting the same target organ system are added to determine the hazard index (HI). Many examples of additivity and synergism (interactive effects greater than additive) are known. For substances that act synergistically, the HRA could underestimate the risks. Some substances may have antagonistic effects (lessen the toxic effects produced by another substance). For substances that act antagonistically, the HRA could overestimate the risks.

Other sources of uncertainty, which may underestimate or overestimate risk, can be found in exposure estimates where little or no data are available (e.g., soil half-life and dermal penetration of some substances from a soil matrix).

The differences among species and within human populations usually cannot be easily quantified and incorporated into risk assessments. Factors including metabolism, target site sensitivity, diet, immunological responses, and genetics may influence the response to toxicants. The human

population is much more diverse both genetically and culturally (e.g., lifestyle, diet) than inbred experimental animals. The intraspecies variability among humans is expected to be much greater than in laboratory animals. Adjustment for tumors at multiple sites induced by some carcinogens could result in a higher potency. Other uncertainties arise 1) in the assumptions underlying the dose-response model used, and 2) in extrapolating from large experimental doses, where, for example, other toxic effects may compromise the assessment of carcinogenic potential, to usually much smaller environmental doses. Also, only single tumor sites induced by a substance are usually considered. When epidemiological data are used to generate a carcinogenic potency, less uncertainty is involved in the extrapolation from workplace exposures to environmental exposures. However, children, a subpopulation whose hematological, nervous, endocrine, and immune systems, for example, are still developing and who may be more sensitive to the effects of carcinogens on their developing systems, are not included in the worker population and risk estimates based on occupational epidemiological data are more uncertain for children than adults. Finally, the quantification of each uncertainty applied in the estimate of cancer potency is itself uncertain.

Thus, risk estimates generated by an HRA should not be interpreted as the expected rates of disease in the exposed population but rather as estimates of potential risk, based on current knowledge and a number of assumptions. Additionally, the uncertainty factors integrated within the estimates of noncancer RELs are meant to err on the side of public health protection in order to avoid underestimation of risk. Risk assessment is best used as a ruler to compare one source with another and to prioritize concerns. Consistent approaches to risk assessment are necessary to fulfill this function.

3.0 RESULTS

The results of the HRA include estimates of incremental residential and worker cancer risks and chronic and acute health hazard indices. These values were calculated for each of three receptor grids specified in the modeling approach section (sensitive, 200-meter, and 400-meter coarse regional networks). Health risk results of the three grids for each alternative were merged and summarized as a whole in Tables 3-1 and 3-2.

The HARP model run outputs summarized the inputs used to develop the health effects estimates including the following:

- Summary of emission rates (maximum hourly or annual average) for each modeled roadway segment
- Health Effect (cancer, chronic, or acute health impacts)
- Risk scenario (i.e., residential or worker)
- Analysis method (Derived OEHHA, Adjusted OEHHA, etc.)

HARP model outputs for all scenarios and receptor networks are included in Appendix G. The model outputs are preceded by a master compilation of results that includes the baseline and project results as well as the differences between the project and baseline.

For incremental cancer risk, the threshold for significance is 10 in one million.. For changes in hazard indices, the significance threshold criterion is 1.0 for both HIC and HIA. Even though cancer risks or hazard indices calculated for individual scenarios (baseline or project alternative), which included non-project related background health risk, could be greater than 10 in a million or 1, respectively, it should be noted that the thresholds apply to incremental increase of a project. Cancer risk was evaluated for both the 70-year average emissions and 2015 emissions scenarios. Due to the uncertainties associated with the 70-yr average emissions scenario, cancer risk was considered significant only when the 2015 emissions scenario predicted incremental risk increases exceed the SCAQMD significance threshold.

3.1 Acute and Chronic Health Impacts

The HARP model was used to estimate the chronic and acute health effects by calculating hazard indices for the following scenarios:

- Baseline (2003) Emissions
- 2015 Emissions with Project
- 2030 Emissions with Project

The maximum acute and chronic health impacts were defined by the highest hazard index in project years (2015 and beyond). Since emissions change (either increase or decrease) linearly between these project years and remain constant after 2030, the maximum impact at each receptor is captured in either the 2015 or 2030 project year.

Appendix D includes a compilation of the Acute and Chronic Hazard Indices for the CEQA baseline year (2003) and project years 2015 and 2030. There would be net decreases in the acute and chronic hazard indices for the project years 2015 and 2030 (as well as intermediate project years) compared to 2003 baseline for all receptors due to improvements in vehicle emission controls in the intermediate years. In addition, the change in acute and chronic hazard indices between project and no-build alternative for the buildout project years 2015 and 2030 are much less than the significance criteria for all receptors. For Alternatives 1 and 2, the maximum increases in acute and chronic hazard indices between project and no-build alternatives are 0, 1 or less. Details of the HIC at each receptor by target organ are included in the HARP outputs in Appendix G. Increases in HIC and HIA are less than one for all scenarios analyzed and are not described further in the results discussion, tables, or figures in the text of the report. The results focus instead on carcinogenic risk for the two alternatives.

3.2 Carcinogenic Health Impacts

Two emission scenarios were included in the health risk assessment (HRA) for cancer risk analysis: one based on 70-year average emissions and the other one based on 2015 emissions. Both scenarios evaluated the cancer risks over a 70-year period. The HARP model was used to estimate the carcinogenic impacts for the following scenarios:

- 70-year Baseline Scenario (2003-2072), without Project
- 70-year Average Emissions Scenario (2003-2072), Alternative 1
- 70-year Average Emissions Scenario (2003-2072), Alternative 2
- 2015 Emissions Scenario without Project
- 2015 Emissions Scenario with Project, Alternative 1
- 2015 Emissions Scenario with Project, Alternative 2

3.2.1 Cancer Risk – 70-year Average Emissions Scenario (For Information Purposes)

Figure 3-1 depicts the change in residential risk for Alternative 1 compared to the 70-year baseline starting in 2003. Note that the results of this scenario are similar to the 2015 emissions scenario, which is considered the preferred depiction of risk as discussed in Section 2.1.4. The impacts are color coded to easily identify locations where there is either decreased risk, increases that are less than significant, and increases above the significance threshold of 10 in a million as calculated using the assumptions for residential risk.

The main areas of increased cancer risk are along Alameda Street and the new SR-47 expressway. There are also small regions of cancer risk increases above 10 in one million in the Lincoln Village and Dominguez neighborhoods. Because truck traffic is diverted from SR-103, which will remain unchanged under Alternative 1, the areas of Long Beach adjacent to SR-103 see decreases in cancer risk from modeled sources.

Figure 3-2 depicts residential cancer risk changes between Alternative 2 and the 70-year baseline (2003-2072). The main areas of increased risks are along existing SR-103 and its extension from Sepulveda to 223rd Street. Residential cancer risk increases above 10 in one million extend roughly

1/3 mile into the portion of Long Beach immediately adjacent to SR-103 and south of Willow Street. Areas of increased cancer risks also extend along Alameda from the terminus of the SR-103 Extension north to Hwy 91. Along Alameda, a narrow band of risk increases above 10 in one million extends roughly 1/10 mile into the western edges of the Dominguez and Lincoln Village neighborhoods (east of Alameda Street, north of I-405 and south of Dominguez Street).

The 70-year average emissions scenario indicates that Alternative 1 produces substantial regional benefits that reduce cancer risks in the majority of the study area. Likewise, there are areas that show increased risk based on the assumptions used for the residential risk assessment. However, not all areas with risk increases are residential neighborhoods. For those non-residential areas, an assessment using more appropriate exposure assumptions is necessary. To perform the analyses, maximum changes in cancer risks for residential, recreational, and school land use areas within the sensitive receptor grid were summarized in a tabular form by land use types. Parks (recreational) and schools (students and faculty) within the sensitive grid have different risk exposure than the normal residential scenario. Therefore, a triage procedure was used to identify the various land use areas in order to examine them in detail.

First, the sensitive receptor grid was divided into geographical groupings. These groupings are shown in Figure 3-3. Areas were then chosen for greater resolution where some residential risk increases were greatest. Four areas were identified: Dominguez, Lincoln Village, Long Beach, and Wilmington.

Within those areas, park and schools were identified for detailed examination. The following parks and schools were identified:

- Admiral Kidd Park (Long Beach)
- Hudson Park (Long Beach)
- East Wilmington Greenbelt (Wilmington)
- Cabrillo High School (Long Beach)
- Elizabeth Hudson School (Long Beach)
- Saint Lucy School (Long Beach)
- Stephens Middle School (Long Beach)
- Wilmington Park Early Educational Center (Wilmington)

Figure 3-1. Change in Residential Cancer Risk: Alternative 1
(70-year Average Emissions Scenario) – Informational

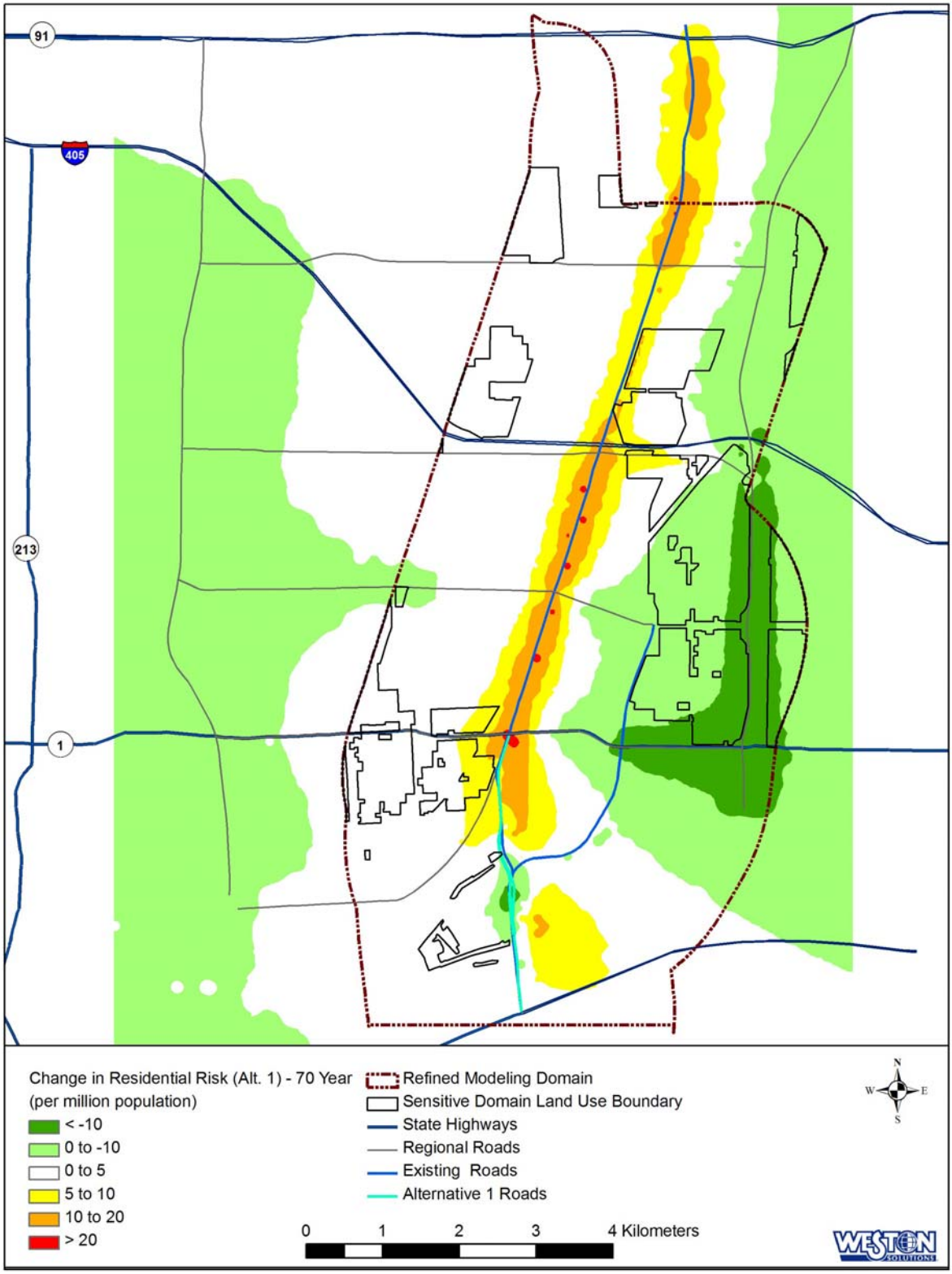


Figure 3-2. Change in Residential Cancer Risk: Alternative 2
(70-year Average Emissions Scenario) – Informational

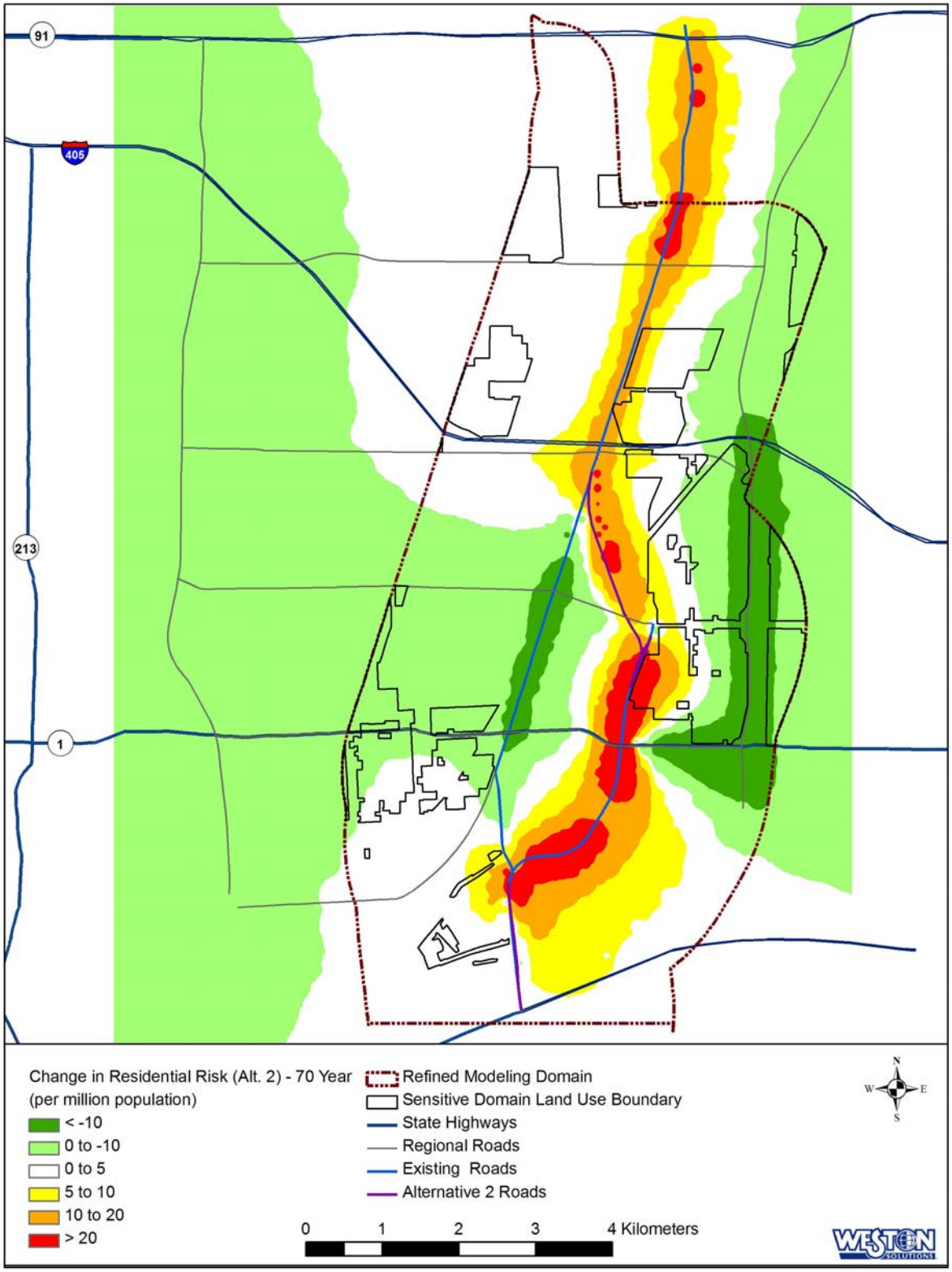


Figure 3-3. Sensitive Domain Land Use

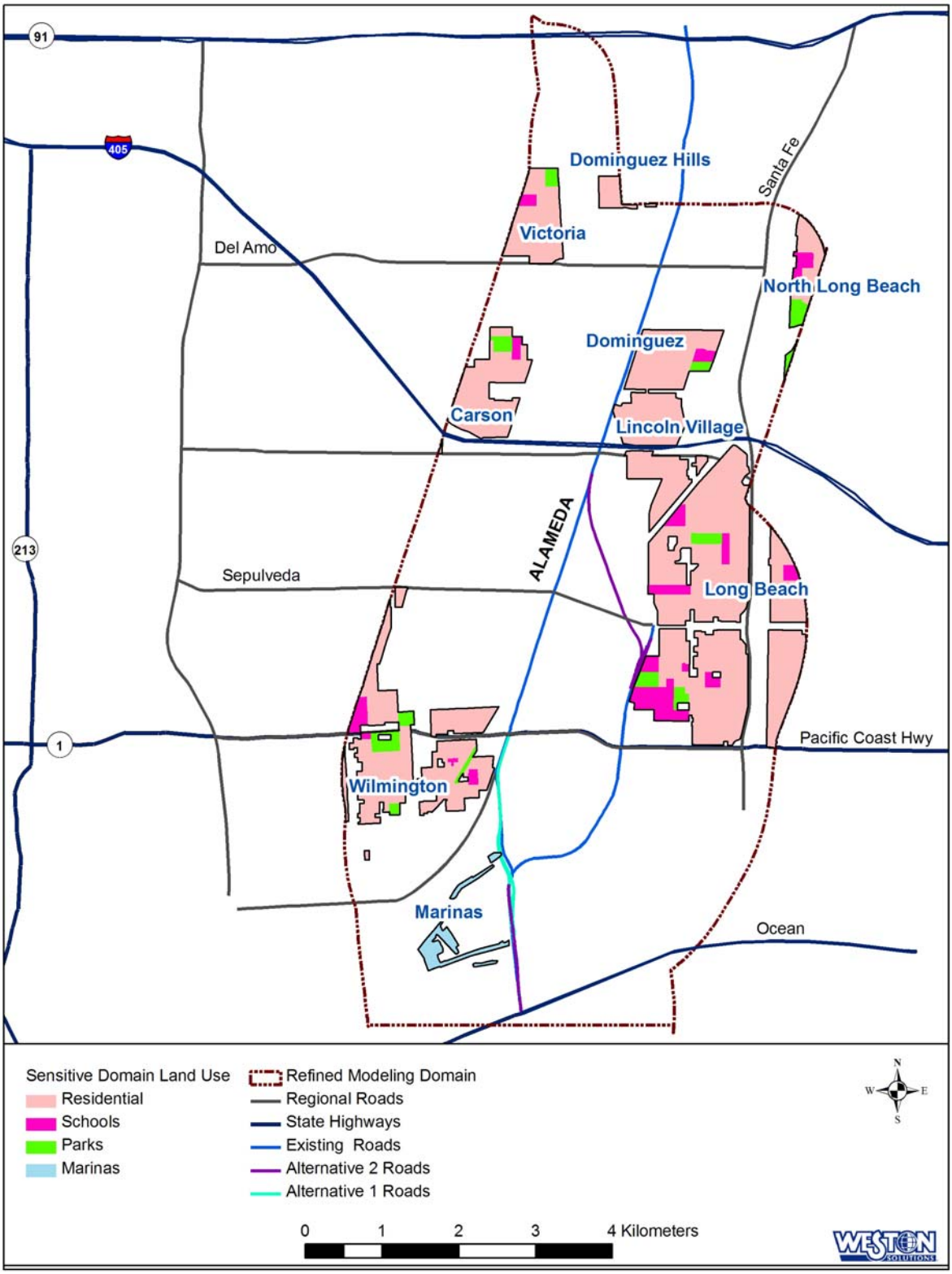
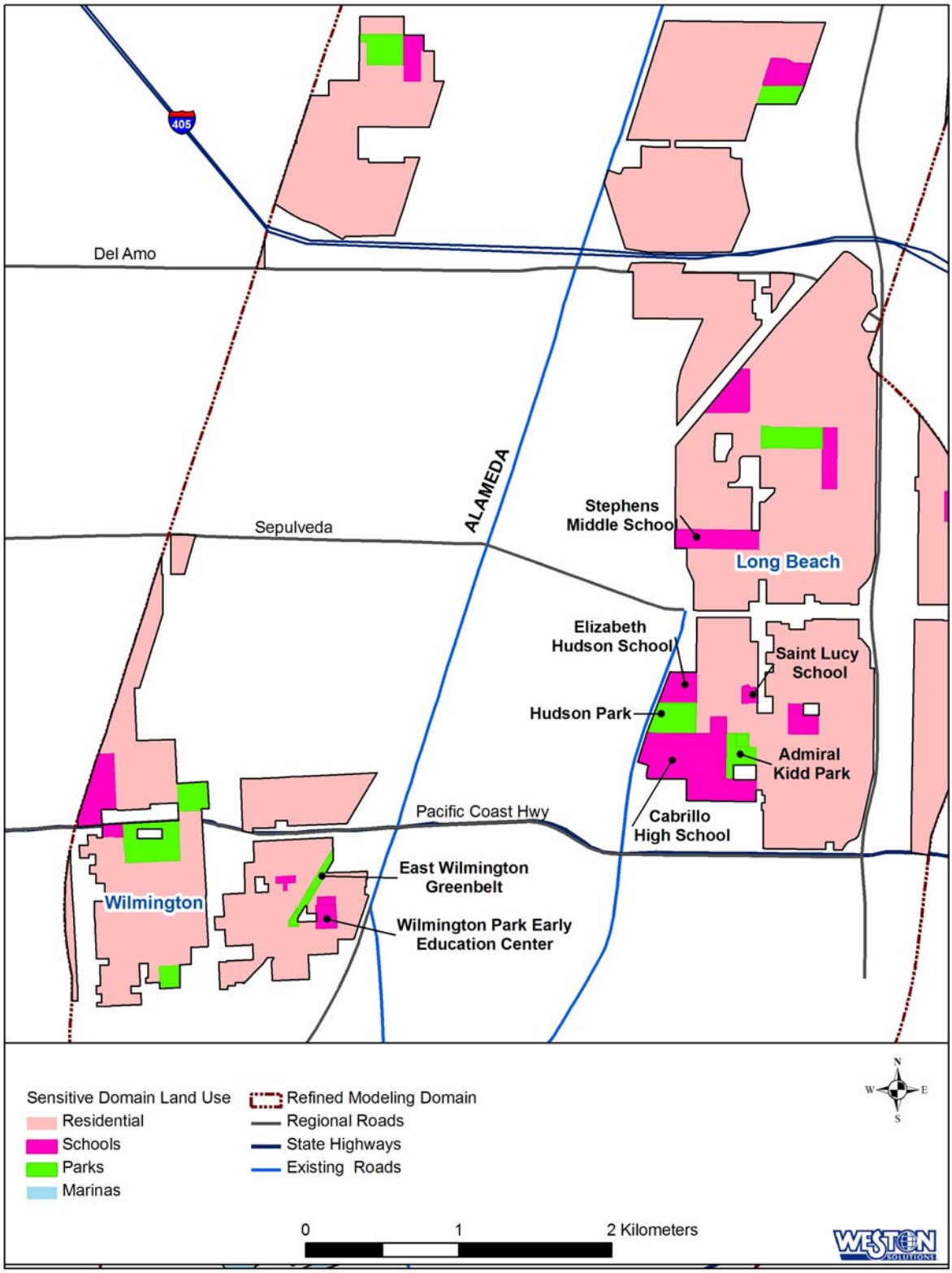


Figure 3-4. Long Beach and Wilmington Region



No parks or schools in modeled sensitive areas other than Wilmington and Long Beach had residential risk increases above the significance threshold criterion. In addition, increased cancer risks for commercial/industrial workers, recreational workers and users, and school workers and students are all estimated to be below the significance threshold criterion.

Table 3-1 highlights for both alternatives the maximum cancer risk for sensitive receptors including nearby residential areas, schools and recreational areas. For Alternative 1, cancer risk increases are predicted in all residential regions, with maximum excess risk ranging from 10.3 to 13.7 in a million. The maximum recreational risk increase of 7.1 in a million occurs in the South Wilmington Greenbelt, and is below the significance threshold. All recreational, worker and student risks at schools were predicted to be less than the significance threshold.

Outside of the sensitive receptor areas (residential neighborhoods, parks, and schools), changes in the worker exposure risks over the entire modeled domain were examined. Increases in workers cancer risks were below the 10 in 1 million threshold for every community within the study area for Alternative 1, with regional benefits exhibited in North Long Beach. The maximum increase in residential risk is 19.9, school worker risk is 15.1 and recreational risk is 17.7 in a million for Alternative 2. In Alternative 2, the areas with worker risk increases above the 10 in a million threshold are all located along and near SR-103.

Table 3-1. Summary of Sensitive Receptor Risks – 70-year Average Emissions (Informational)

Table 3-1
Summary of Sensitive Receptor Risks: 70-Year Average Emissions (Informational)

Alternative 1
All risks are expressed in number per million

Residential Regions	Receptor1	UTM Coordinates2 East (m)	UTM Coordinates2 North (m)	Residential Risk Baseline	Residential Risk Alt 1	Residential Risk Increase
Dominguez	2535	386,675	3,744,275	164.0	177.6	13.6
Lincoln Village	2389	386,525	3,743,825	160.0	173.7	13.7
Long Beach	2254	386,725	3,743,275	109.0	119.4	10.4
Wilmington	1372	384,875	3,739,375	99.8	110.1	10.3

Recreational Areas	Receptor1	UTM Coordinates2 East (m)	UTM Coordinates2 North (m)	Worker Risk Baseline	Worker Risk Alt 1	Worker Risk Increase	Adjusted Recreational Risk Baseline	Adjusted Recreational Risk Alt 1	Adjusted Recreational Risk Increase
Hudson Park	1695	386,825	3,740,425	27.6	27.4	None	41.5	41.0	None

School Areas	Receptor1	UTM Coordinates2 East (m)	UTM Coordinates2 North (m)	40-year Staff Risk Baseline	40-year Staff Risk Alt 1	40-year Staff Risk Increase	Adjusted 13-year Student Risk Baseline	Adjusted 13-year Student Risk Alt 1	Adjusted 13-year Student Risk Increase
Cabrillo High School	1623	386,775	3,740,225	31.0	30.6	None	7.2	7.1	None

Alternative 2
All risks are expressed in number per million

Residential Regions	Receptor1	UTM Coordinates2 East (m)	UTM Coordinates2 North (m)	Residential Risk Baseline	Residential Risk Alt 2	Residential Risk Increase
Dominguez	2586	386,725	386,725	164.0	182.7	18.7
Lincoln Village	2389	386,525	386,525	160.0	178.7	18.7
Long Beach	1718	387,125	387,125	116.0	135.9	19.9
Wilmington	1191	384,425	384,425	60.7	62.2	1.5

Recreational Areas	Receptor1	UTM Coordinates2 East (m)	UTM Coordinates2 North (m)	Worker Risk Baseline	Worker Risk Alt 2	Worker Risk Increase	Adjusted Recreational Risk Baseline	Adjusted Recreational Risk Alt 2	Adjusted Recreational Risk Increase
Hudson Park	1695	386,825	3,740,425	27.6	39.4	11.8	41.5	59.1	17.7

School Areas	Receptor1	UTM Coordinates2 East (m)	UTM Coordinates2 North (m)	40-year Staff Risk Baseline	40-year Staff Risk Alt 2	40-year Staff Risk Increase	Adjusted 13-year Student Risk Baseline	Adjusted 13-year Student Risk Alt 2	Adjusted 13-year Student Risk Increase
Cabrillo High School	1623	386,775	386,775	31.0	46.1	15.1	7.2	10.7	3.5

NOTES
1 - Multiple receptors may share maximum risk increase; receptor listed is lowest-numbered

2 - Universal Transverse Mercator projection, Zone 11, NAD 8

In order to put the risk number in perspective, a screening cancer burden calculation was used to translate the risk estimate to the number of people actually exposed (OEHHA, 2003). Cancer burden is the estimated increase in occurrence in cancer cases in the population subject to a certain level of cancer risk resulting from exposure to toxic air contaminants. The screening cancer burden calculation multiplies the risk probability by the average population in the affected area. To be conservative, the screening method identifies all residential receptors in the project area with an incremental risk greater than one in a million by grid cell with dimensions of 50 or 100 square meters. The population density assumption used was 7,000 people per square kilometer (SCAQMD, 2008). The predicted risk in each grid cell was multiplied by this default population assumption in order to calculate cancer burden. Then the cancer burden by grid cell was summed to calculate the overall cancer burden for the project study area. Using this calculation method, the number of excess cancer cases from the project would be one to two hundredths of a person in 70 years. The cancer burden for each alternative in both scenarios is of similar magnitude. In addition, increased cancer risks for commercial/industrial workers, recreational workers and users, and school workers and students are all estimated to be below the significance criteria.

3.2.2 Cancer Risk – 2015 Emissions Scenario

2015 is the preferred emissions scenario to be used for significance evaluation as well as the basis for mitigation. The 2015 emission scenario was based on more reasonable foreseeable conditions (already adopted or about to be adopted regulations) than those assumed in the 70-year emissions scenario.

Figures 3-5 and 3-6 depict the change in residential risk for Alternatives 1 and 2, using 2015 emissions conditions. The 2015 emissions scenario represents the most likely case for overall 70-year project emissions, as well as incorporates only those truck emission control measures that are mandated under current or reasonably foreseeable CARB rules or Port Clean Truck Programs. The residential risk follows the same distribution in terms of sensitive receptors as the 70-year average emissions scenario, but has a smaller footprint. Approximately ninety-seven percent of the cancer risk can be attributed to DPM, 1 percent to 1-3 butadiene, 1 percent to benzene, and less than 1 percent to all the other compounds. The contribution of individual pollutants to cancer risk is

provided in Appendix E. A summary of maximum sensitive receptor risks for the 2015 emissions scenario is presented in Tables 3-1 and 3-2 for purposes of significance evaluation and mitigation

In Alternative 1, maximum residential cancer risk ranges from 5.4 to 10.6 in a million. Less than significant maximum cancer risk increases are predicted for workers (0.4 in a million); recreational users (0.6 in a million), and students (0.1 in a million). The main areas of increased cancer risk are along Alameda Street and the new SR-47 expressway. There are very small areas of above 10 in one million cancer risk increases that touch the edges of the Wilmington, Dominguez, and Lincoln Village neighborhoods.

In Alternative 2, maximum residential incremental cancer risk ranges from 6.3 to 16.1 in a million. Maximum incremental recreational user risks in Hudson Park (14.1 in a million) and incremental staff risks at Cabrillo High School are greater than the significance threshold of 10 in a million. The main areas of increased risk are along existing SR-103 and its extension from Sepulveda to 223rd Street. Residential cancer risk increases above 10 in one million extend roughly 1/3 mile into the portion of Long Beach immediately adjacent to SR-103 and south of Willow Street. Maximum incremental recreational worker (9.4 in a million) and incremental student cancer risks (2.8 in a million) are less than significant.

Although in the 2015 emissions scenario for Alternative 1 there are areas where the predicted cancer risk increases exceed the SCAQMD significance threshold, the elevated risk only affects a limited number of homes (less than 30). Feasible mitigation measures are available to reduce the estimated risk to less than the significance level of 10 in a million (See Section 4 for details). In Alternative 2, the residential, school and worker risks can also be feasibly mitigated but the recreational risk would still be considered significant.

Figure 3-5. Change in Residential Risk: Alternative 1, 2015 Scenario (Preferred)

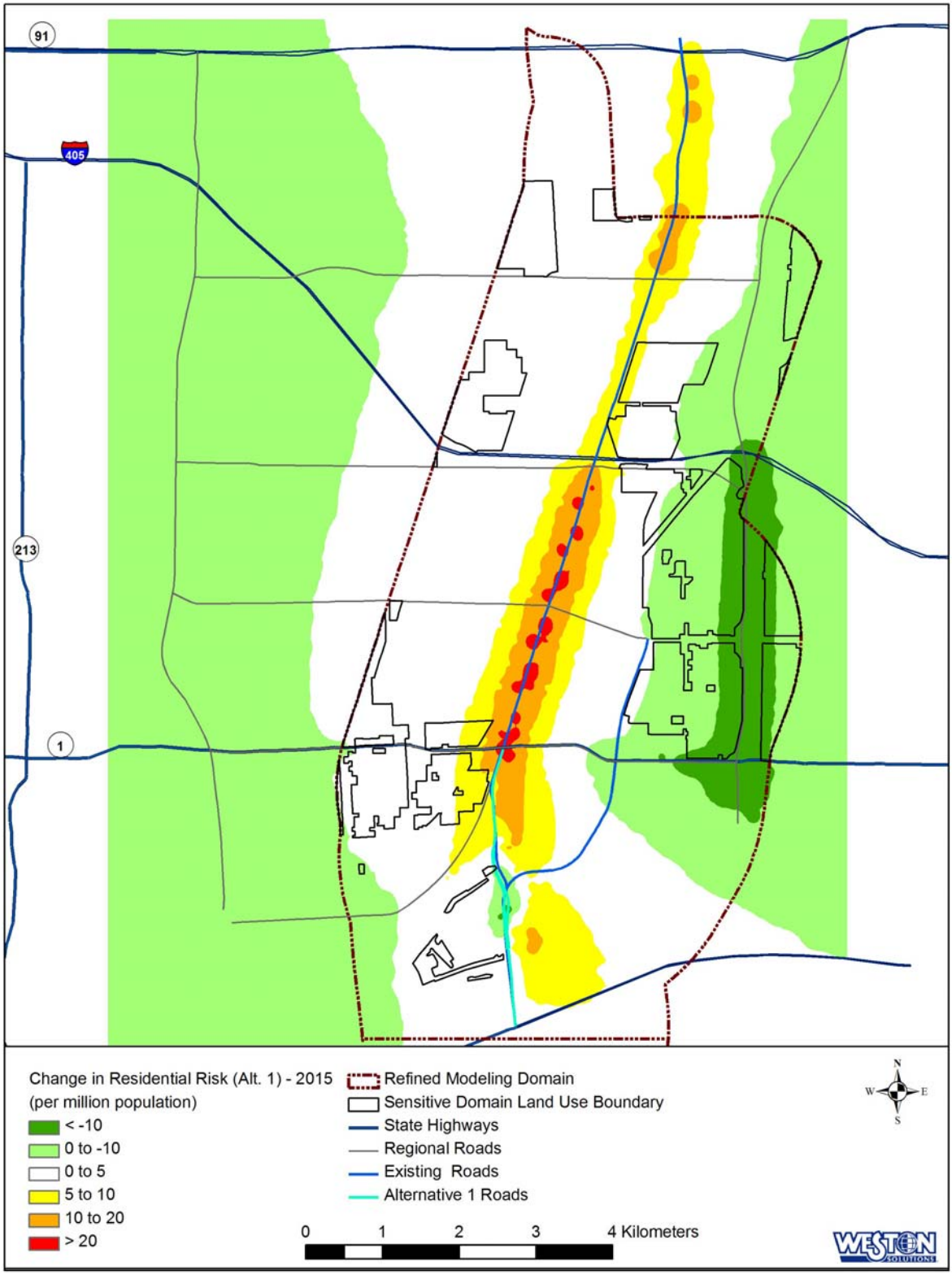


Figure 3-6. Change in Residential Risk: Alternative 2, 2015 Scenario (Preferred)

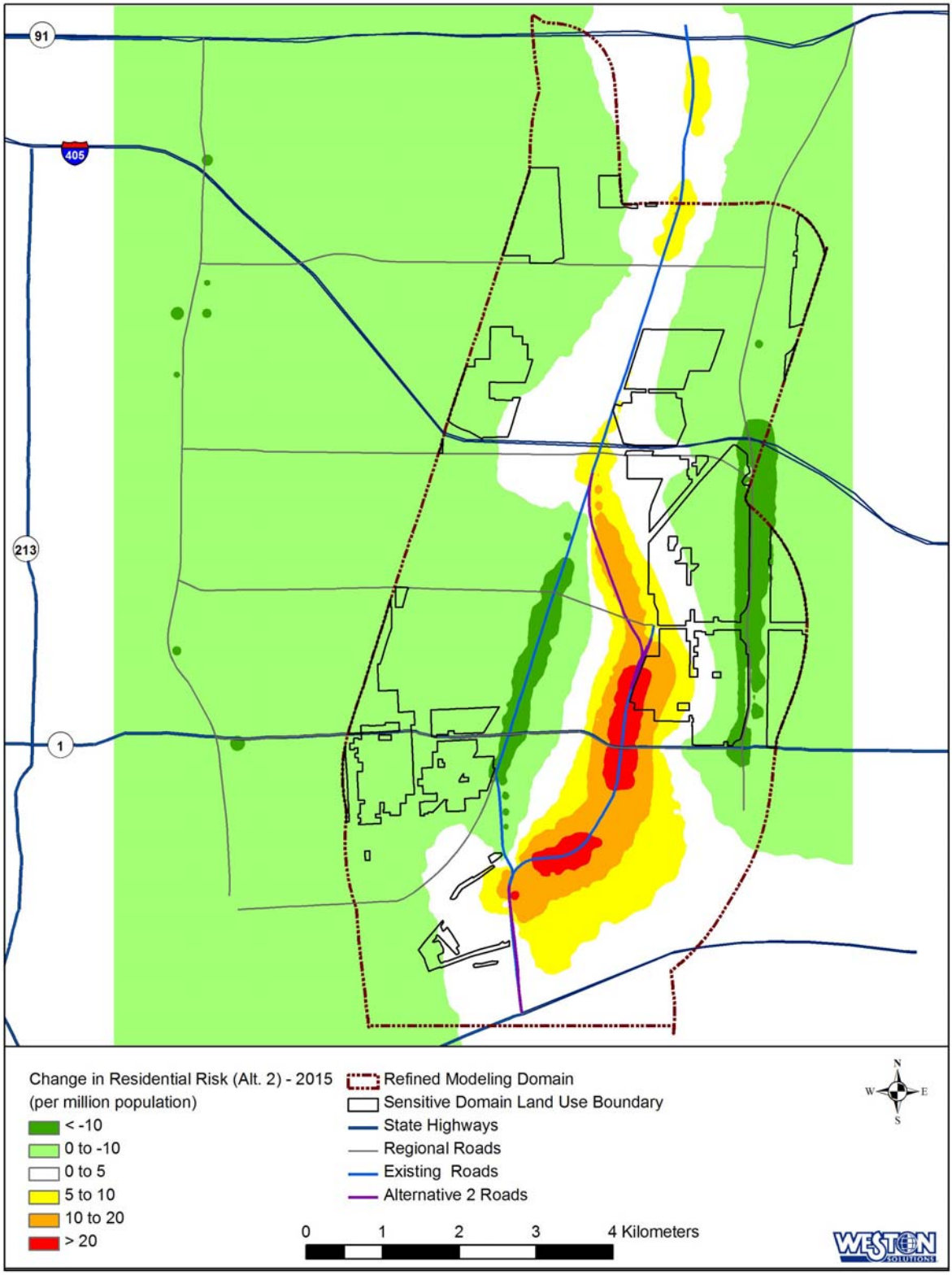


Table 3-2. Summary of Sensitive Receptors Risks: 2015 Emissions Scenario (Preferred)

Table 3-2
Summary of Sensitive Receptor Risks: 2015 Emissions Scenario (Preferred)

Alternative 1
All risks are expressed in number per million

Residential Regions	Receptor1	UTM Coordinates2 East (m)	UTM Coordinates2 North (m)	Residential Risk Baseline	Residential Risk Alt 1	Residential Risk Increase
Dominguez	2535	386,675	3,744,275	87.8	97.6	9.8
Lincoln Village	2389	386,525	3,743,825	84.9	95.0	10.1
Long Beach	2274	386,675	3,743,375	52.5	57.9	5.4
Wilmington	1548	384,975	3,740,025	39.7	50.3	10.6

Recreational Areas	Receptor1	UTM Coordinates2 East (m)	UTM Coordinates2 North (m)	Worker Risk Baseline	Worker Risk Alt 1	Worker Risk Increase	Adjusted Recreational Risk Baseline	Adjusted Recreational Risk Alt 1	Adjusted Recreational Risk Increase
Hudson Park	1677	386,825	3,740,375	10.9	11.3	0.4	16.4	17.0	0.6

School Areas	Receptor1	UTM Coordinates2 East (m)	UTM Coordinates2 North (m)	40-year Staff Risk Baseline	40-year Staff Risk Alt 1	40-year Staff Risk Increase	Adjusted 13-year Student Risk Baseline	Adjusted 13-year Student Risk Alt 1	Adjusted 13-year Student Risk Increase
Cabrillo High School	1623	386,775	3,740,225	10.8	11.2	0.4	2.5	2.6	0.1

Alternative 2
All risks are expressed in number per million

Residential Regions	Receptor1	UTM Coordinates2 East (m)	UTM Coordinates2 North (m)	Residential Risk Baseline	Residential Risk Alt 1	Residential Risk Increase
Dominguez	2535	386,675	3,744,275	87.8	94.1	6.3
Lincoln Village	2389	386,525	3,743,825	84.9	91.8	6.9
Long Beach	1736	387,125	3,740,525	50.1	66.2	16.1
Wilmington	1189	384,325	3,738,725	26.7	26.4	None

Recreational Areas	Receptor1	UTM Coordinates2 East (m)	UTM Coordinates2 North (m)	Worker Risk Baseline	Worker Risk Alt 2	Worker Risk Increase	Adjusted Recreational Risk Baseline	Adjusted Recreational Risk Alt 2	Adjusted Recreational Risk Increase
Hudson Park	1677	386,825	3,740,375	10.9	20.3	9.4	16.4	30.5	14.1

School Areas	Receptor1	UTM Coordinates2 East (m)	UTM Coordinates2 North (m)	40-year Staff Risk Baseline	40-year Staff Risk Alt 2	40-year Staff Risk Increase	Adjusted 13-year Student Risk Baseline	Adjusted 13-year Student Risk Alt 2	Adjusted 13-year Student Risk Increase
Cabrillo High School	1623	386,775	3,740,225	10.8	22.7	11.9	2.5	5.3	2.8

NOTES
1 - Multiple receptors may share maximum risk increase; receptor listed is lowest-numbered.

2 - Universal Transverse Mercator projection, Zone 11, NAD 83

3.2.3 Recommended Risk Scenario

The 2015 emission scenario is recommended as the preferred emissions scenario to be used for evaluating project significance as well as the basis for mitigation because it is based on reasonable foreseeable conditions (adopted already or about to be adopted regulations.) I*t avoids much of the speculation of the 70-year analysis, which assumes that significant growth in imports and truck traffic will occur without any advances in technology past 2020 to reduce emissions associated with goods movement.* There are credible arguments for asserting that the projected risk may be over-predictive using the 70-year average emissions scenario and it may be unnecessary to advance additional mitigation over what would be necessary in 2015 at this time. Factors that contribute to over-prediction of potential risks *in the 70-year analysis* include:

- *Potentially unrealistic growth assumptions.* The analysis assumed growth in port operations, consistent with recent environmental evaluations (to 44 million TEU's in 2020). The ports' estimated terminal capacity of 42.5 million TEU's is based on the assumption that considerable additional acres of land can be developed for port purposes. Absent that, a more realistic estimate is under 36 million TEUs, substantially less than what was used in this analysis to predict increases. Many factors can affect growth projections including the current economic downtrend, which may lead to reduced demand for imported goods, and recently imposed fees that may make importation through the San Pedro ports less economically attractive in the future. If growth in imports is less than projected, or diversion of cargo to other more economically advantageous ports occurs, truck emissions will be lower than projected and health risks will decrease accordingly. Other ports positioned to compete with the Los Angeles and Long Beach ports are located on the Gulf and East Coasts via the Panama Canal and Suez Canal, as well as West Canadian and Mexican ports. Potential loss of LA/LB market share would significantly reduce the port-related traffic on the SR-47 beyond 2015.

- *Lack of future regulations.* The 70-year analysis assumes that while traffic continues to increase, no regulations will be adopted to reduce truck emissions other than those currently adopted or proposed for adoption. Thus, for over 50 years (2020-2073) emissions are projected to grow due to increased traffic but no emissions reductions are assumed due to

new regulations. The clear trend in air pollution control is for increasingly stringent vehicle emission and vehicle fuel standards to be adopted by ARB and the Federal EPA every 5 to 7 years. During the last ten years, regulations have been promulgated that reduce NOx and PM by 35%; in the next few years EPA expects to reduce diesel PM by 94%. Therefore, the assumption that no additional regulations will be adopted is highly unrealistic given the history of vehicle regulation in California. In fact, it is highly likely that a series of additional regulatory programs would be implemented during the 70-year period evaluated in this health risk analysis.

- The analysis incorporated the fact that the Ports of Long Beach and Los Angeles have committed to a truck retrofit program, as well as an LNG hybrid retrofit program through 2012. The analysis has assumed significant deterioration of the fleet from 2015 to 2030 (10 to 15 percent) due to aging. The Port's Clean Trucks Program will lead to more rapid fleet turnover than in the past due to the issuance of port concessions, more trucking by larger companies with the capital to replace trucks more often, and a reduction in independent operators due to more stringent port requirements and competition. CARB's proposed on-road heavy duty truck regulation, scheduled for adoption in late 2008, will also accelerate fleet turnover. A more rapid fleet turnover rate may limit this deterioration in emission rates.

- *New motor vehicle fuels. A* more diversified approach to alternate fuels (beyond biodiesel) may result in substantially more DPM emission reductions.

- *New goods movement technologies. T*he ports are also investigating electric trucks and other zero-emissions container movement systems and would eliminate existing sources of diesel emissions.

The more likely scenario is that advanced emission control technologies, fleet turnover higher than in past years, and innovations in goods movement technologies will maintain or improve the overall truck emissions profile at or near 2015 levels (or lower). Given past state and local efforts to address vehicle emissions and their success in reducing overall emissions despite significant increases in traffic volumes, it is not unrealistic to assume that even if traffic increases as projected in the 70-

year analysis, the associated emissions will not increase beyond 2015 levels because they will be offset by new regulatory programs and innovations. Using 2015 truck emissions over a 70-year period is a reasonable method to calculate risk taking into consideration the inherent uncertainties in this type of methodology. For these reasons, the 2015 emissions scenario is recommended as a more realistic estimate of health risk associated with the project than the 70-year analysis.

4.0 MITIGATION APPROACH AND EFFECTIVENESS ASSESSMENT

The results of the risk evaluation of 2015 emissions scenario were used as the basis for mitigation of residential exposure in Alternative 1. Where significant 70-year cancer risk in the vicinity of the project area was predicted under the 2015 emissions scenario, field verification of receptors was performed. Field verification efforts included visual reconnaissance of the affected area where location, type, and size of dwelling was noted. The results of the field verification effort were that less than 30 homes are within the significant impact zone.

Retrofit of heating, ventilating, and air conditioning (HVAC) units within the vicinity of the significant impact zone were evaluated and determined to be a feasible mitigation measure. The rationale behind the choice of home HVAC retrofit is as follows:

- This measure can be effectively implemented by a transportation authority and directly benefits the impacted community.
- The measure has been used effectively in mitigating the health risks of other transportation projects (e.g., San Diego Metropolitan Transit Development Board light rail project along Highway 8).
- The retrofit of high efficiency filters on either an existing or new HVAC system will be capable of removing the pollutant that drives health risk in the community, namely diesel particulate matter.

For purposes of this assessment, the efficiency of diesel particulate removal is estimated to be 90 percent. This estimate is a conservative assumption, since the guaranteed removal rate is closer to 99 percent based on manufacturers' data. However, in this case, much lower removal rates (in the 20 - 30 percent range) would still be considered effective mitigation.

Since the maximum residential receptor risk along the transportation corridor in 2015 is estimated to be less than 11 in a million, HVAC retrofits would be an effective mechanism to mitigate incremental health risks to levels below the significance criterion threshold (10 in a million). The retrofits would involve installing new heating and air conditioning systems with high efficiency filters in selected homes along the expressway corridor. The filters will be capable of removing the diesel particulate responsible for the majority of the contribution of health risk from the ambient air. The efficiency of the filters is more than

capable of reducing the residential health risk to insignificance. HVAC retrofits are the preferred approach since they have already been used in similar projects to protect sensitive receptors from diesel risk and they are very specific residential improvements to the neighborhoods directly affected by project impacts.

Since the recreational exposure occurs outdoors, HVAC retrofits would not be an effective approach to mitigation of this significant health risk. However, this health risk is only predicted for Alternative 2.

5.0 CONCLUSIONS

Implementation of the proposed project would result in widespread regional benefit in terms of cancer risk reduction. Although no acute or chronic hazard was observed for any of the potentially exposed population, there are hot spots of predicted significant cancer risk in neighborhoods along the corridor in both alternatives. Alternative 2 results in higher predicted cancer risk than Alternative 1 due, to large part, to the proximity of the truck route to residential neighborhoods, schools, and recreation areas. Two scenarios were developed to evaluate incremental health risk in a robust manner. Emission reductions were incorporated into future years for existing regulations or other regulations currently proposed for adoption (CARB's On-Road Heavy Duty Truck Regulations). Both scenarios have similar outcomes in terms of risk depiction. The preferred 2015 emissions scenario was utilized for significance and mitigation purposes because of the greater uncertainty associated with a 70-year exposure based on composite (2003 to 2072) emissions. With the use of HVAC retrofits on residential structures, the predicted potentially significant health risk can feasibly be mitigated to below the significance threshold in Alternative 1, while recreational risk in Alternative 2 would still be considered significant using this mitigation approach.

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LIST OF APPENDICES

Appendix A: Vehicle Exhaust Emissions, Emission Factors and Speciation of Chemical Compounds

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APPENDIX A

Vehicle Exhaust Emissions
Emission Factors and Speciation of Chemical Compounds

Appendix A Contents

Summary of Chemical Compounds and list of Health Values used in HRA

Consolidated Truck Emission Factors

EMFAC07 File Ouput: SCAG Trucks, Adjusted for "Statewide Truck and Bus Regulation"

EMFAC07 File Outputs: SCAG Heavy Duty Trucks incorporating "Statewide Truck and Bus Regulation"

EMFAC07 File Output: PORT Trucks

EMFAC07 File Output: AUTOs

LNG Truck Emission Factor Calculations (EMFAC Methodology)

Speciation Profiles for Diesel Truck Exhaust: PM and TOG

Speciation Profiles for LNG Truck Exhaust: PM and TOG

Speciation Profile for Gasoline Exhaust: TOG

Summary of Chemical Compounds evaluated in the HRA:

Vehicle exhaust emissions for roadways were evaluated for both chronic (cancer risk and chronic HI) and acute health impacts (acute HI). Emissions were compiled in g/mile for TOG and PM exhaust from the following vehicle types:

Vehicle Type	Fuel
Port Trucks (HDDT)	Diesel
Port Trucks (LNG)	LNG / Diesel
SCAG Trucks	Diesel & Gasoline
Automobiles	Gasoline
** LNG Trucks use diesel fuel in an auxiliary manner	

Gaseous and particulate vehicle exhaust for these vehicle categories were first estimated by using the EMFAC07 emission factors for total organic gases (TOG) and particulate matter (PM) (provided in this appendix) for the appropriate speed of each roadway link. Subsequent to this, emissions for individual chemical compounds are estimated for each vehicle category by applying speciation profiles for the vehicle category to the particulate or gaseous (TOG) emissions. MSAT profiles were used for speciating the gasoline emissions. LNG and diesel speciation profiles were developed from CARB data. These profiles are included within this appendix.

For diesel trucks, diesel engine exhaust particulate matter cancer potency factors and chronic RELs were used in the HRA. However, since there are not any established acute health exposure limits for diesel exhaust, acute health effects diesel exhaust was evaluated by speciating both the TOG and PM components of the exhaust into individual toxic compounds.

The following table lists the vehicle categories by exhaust and the chemical compounds included in the HRA and HARP modeling. An additional table summarizes risk assessment values used in HARP v 1.4a including an indication of cancer and non-cancer toxicological data. Note that several of the compounds in the HRA are included only for the acute analysis, where diesel is speciated into individual compounds to evaluate health effects. When compounds are added for only this analysis, there may be health effects toxicity values for cancer and chronic health effects but they are not included in the HRA since the chemicals are evaluated only on a short-term or acute basis.

Compounds Included for Cancer Risk and Hazard Index Calculations

	Diesel Exhaust	LNG Exhaust	Gasoline Exhaust	Speciated Diesel **
Diesel exh, PM	×	×		
Acetaldehyde			×	×
Acrolein			×	
Ammonia				×
Antimony				×
Arsenic				×
Benzene			×	×
Bromine		×		×
1,3-Butadiene			×	×
Cadmium				×
Chlorine		×		×
Chromium (VI)		×		×
Copper		×		×
Ethyl benzene		×		×
Formaldehyde		×	×	×
Hexane				×
Lead				×
Manganese		×		×
Mercury				×
Methanol				×
Methyl ethyl ketone				×
Nickel		×		×
Propylene		×		×
Selenium				×
Styrene				×
SULFATES		×		×
Toluene		×		×
Vanadium				×
Xylene		×		×
Zinc		×		×

** Used for Acute HI Evaluation Onlly

Appendix A: RISK ASSESSMENT HEALTH VALUES USED IN HARP (VERSION 1.4a) MODELING

TAC Compounds		Cancer Risk			Non-Cancer Risk			
CAS #	Chemical Name	Inhalation Unit Risk (µg/m3)-1	Inhalation Cancer Potency Factor (mg/kg-d)-1	Oral Slope Factor (mg/kg-d)-1	Chronic Inhalation (µg/m3)	Chronic Oral (mg/kg/d)	Acute Inhalation (µg/m3)	Averaging Time for Acute REL (hour)
9901	Diesel engine exhaust, particulate matter	3.00E-04	1.10E+00	-	5.00E+00	-	-	-
75070	Acetaldehyde	2.70E-06	1.00E-02	-	9.00E+00	-	-	-
107028	Acrolein	-	-	-	6.00E-02	-	1.90E-01	1
7664417	Ammonia	-	-	-	2.00E+02	-	3.20E+03	1
7440360	Antimony	-	-	-	-	-	-	-
7440382	Arsenic	3.30E-03	1.20E+01	1.50E+00	3.00E-02	3.00E-04	1.90E-01	4
71432	Benzene	2.90E-05	1.00E-01		6.00E+01	-	1.30E+03	6
7726956	Bromine	-	-	-	-	-	-	-
106990	1,3-Butadiene	1.70E-04	6.00E-01	-	2.00E+01	-	-	-
7440439	Cadmium	4.20E-03	1.50E+01	-	2.00E-02	5.00E-04	-	-
7782505	Chlorine	-	-	-	2.00E-01	-	2.10E+02	1
18540299	Chromium, hexavalent (& compounds)	1.50E-01	5.10E+02	-	2.00E-01	2.00E-02		
7440508	Copper	-	-	-	-	-	1.00E+02	1
100414	Ethyl benzene		8.70E-03		2.00E+03	-		
50000	Formaldehyde	6.00E-06	2.10E-02		3.00E+00	-	9.40E+01	1
110543	Hexane				7.00E+03	-	-	-
7439921	Lead	1.20E-05	4.20E-02	8.50E-03	-	-	-	-
7439965	Manganese	-	-	-	2.00E-01	-	-	-
7439976	Mercury	-	-	-	9.00E-02	3.00E-04	1.80E+00	1
67561	Methanol	-	-	-	4.00E+03	-	2.80E+04	1
78933	Methyl ethyl ketone {2-Butanone}	-	-	-	-	-	1.30E+04	1
7440020	Nickel	2.60E-04	9.10E-01		5.00E-02	5.00E-02	6.00E+00	1
115071	Propylene	-	-	-	3.00E+03	-	-	-
7782492	Selenium	-	-	-	2.00E+01	-	-	-
100425	Styrene	-	-	-	9.00E+02	-	2.10E+04	1
9960	SULFATES	-	-	-	-	-	1.20E+02	1
108883	Toluene	-	-	-	3.00E+02	-	3.70E+04	1
7440622	Vanadium (fume or dust)	-	-	-	-	-	3.00E+01	1
1210	Xylenes (mixed)	-	-	-	7.00E+02	-	2.20E+04	1
7440666	Zinc	-	-	-	-	-	-	-

Consolidated Truck Emission Factors

2003 Composite emission factors for DPM and TOG					
Speed Bin (miles/hour)	SCAG Gas Trucks TOG (grams/mile)	SCAG Dsl Trucks PM10 (grams/mile)	SCAG Dsl Trucks TOG (grams/mile)	Port Dsl Trucks PM10 (grams/mile)	Port Dsl Trucks TOG (grams/mile)
5	6.684394	2.849000	9.473000	4.746000	17.418000
10	4.382190	1.987000	5.524000	3.248000	10.009000
15	2.995040	1.357000	2.837000	2.151000	4.975000
20	2.133965	0.985000	1.558000	1.520000	2.607000
25	1.584874	0.829000	1.269000	1.279000	2.114000
30	1.226976	0.707000	1.042000	1.090000	1.724000
35	0.990751	0.618000	0.874000	0.952000	1.437000
40	0.833112	0.560000	0.765000	0.865000	1.253000
45	0.730451	0.532000	0.714000	0.828000	1.172000
50	0.667584	0.533000	0.719000	0.843000	1.194000
55	0.635561	0.564000	0.780000	0.909000	1.320000
60	0.630499	0.623000	0.897000	1.026000	1.548000
65	0.652220	0.710000	1.070000	1.194000	1.879000

2015 Composite emission factors for DPM and TOG					
Speed Bin (miles/hour)	SCAG Gas Trucks TOG (grams/mile)	SCAG Dsl Trucks PM 10** (grams/mile)	SCAG Dsl Trucks TOG (grams/mile)	Port Dsl Trucks PM 10** (grams/mile)	Port Dsl Trucks TOG (grams/mile)
5	1.703	0.211	4.701	0.073	3.017
10	1.117	0.179	2.643	0.067	1.645
15	0.763	0.153	1.314	0.060	0.787
20	0.544	0.134	0.756	0.056	0.463
25	0.403	0.122	0.624	0.054	0.404
30	0.313	0.116	0.518	0.055	0.352
35	0.252	0.115	0.437	0.058	0.308
40	0.213	0.119	0.381	0.063	0.270
45	0.186	0.126	0.349	0.070	0.240
50	0.170	0.138	0.339	0.080	0.217
55	0.162	0.153	0.353	0.092	0.201
60	0.160	0.171	0.390	0.106	0.192
65	0.166	0.194	0.449	0.122	0.190

** Diesel PM Emission Factor incorporates a 10% Reduction accounting for discrete AB32 early action measures including the low carbon fuel standard (LCFS) and the SmartWay truck fuel efficiency program.

2030 Composite emission factors for DPM and TOG					
Speed Bin (miles/hour)	SCAG Gas Trucks TOG (grams/mile)	SCAG Dsl / Alternative Fuel Trucks PM 10** (grams/mile)	SCAG Dsl / Alternative Fuel Trucks TOG (grams/mile)	Port Dsl / Alternative Fuel Trucks PM 10** (grams/mile)	Port Dsl / Alternative Fuel Trucks TOG (grams/mile)
5	0.217	0.097	1.873	0.060	2.809
10	0.142	0.081	1.052	0.055	1.531
15	0.097	0.068	0.536	0.050	0.733
20	0.069	0.059	0.333	0.046	0.431
25	0.051	0.053	0.288	0.045	0.376
30	0.040	0.050	0.250	0.046	0.328
35	0.032	0.048	0.218	0.047	0.286
40	0.027	0.049	0.192	0.052	0.252
45	0.024	0.051	0.172	0.058	0.223
50	0.022	0.055	0.157	0.066	0.202
55	0.021	0.060	0.147	0.076	0.187
60	0.020	0.066	0.142	0.088	0.179
65	0.021	0.074	0.142	0.101	0.177

** Diesel PM Emission factors incorporate a 35% reductionto account for AB32 measures including LCFS, fuel efficiency, and vehicle hybridization strategies.

Gas and Dsl Fractions (% of SCAG trucks that are Dsl-powered; based on South Coast Air Basin data from EMFAC)

Year	Gas	Dsl Proportion	
2003	62.7%	37.3%	100.0%
2015	52.3%	47.7%	100.0%
2030	51.9%	48.1%	100.0%

2003 Emission Factors			
Port LNG Trucks		Port LNG Trucks	
TOG (LNG Comp) (grams/mile)	TOG (Dsl Comp) (grams/mile)	PM (LNG Comp) (grams/mile)	DPM Exhaust (grams/mile)
Not Applicable - No LNG Trucks in this Year			

2015 Emission Factors			
Port LNG Trucks		Port LNG Trucks	
TOG (LNG Comp) (grams/mile)	TOG (Dsl Comp) (grams/mile)	PM (LNG Comp) (grams/mile)	DPM Exhaust (grams/mile)
0.5904	0.0311	0.0918	0.0048
Emission Factor is for all speeds			

2030 Emission Factors			
Port LNG Trucks		Port LNG Trucks	
TOG (LNG Comp) (grams/mile)	TOG (Dsl Comp) (grams/mile)	PM (LNG Comp) (grams/mile)	DPM Exhaust (grams/mile)
0.4890	0.0257	0.1114	0.0059
Emission Factor is for all speeds			

Title: SCAG Truck Emission Factors - SR47 (edited to include Statewide Diesel Truck and Bus Regulation)
Version : Emfac2007 V2.3 Nov 1 2006

Scen Year: 2003 -- All model years in the range 1965 to 2003 selected
Season : Annual
Area : South Coast
****

Year: 2003 -- Model Years 1965 to 2003 Inclusive -- Annual
Year:
Emfac2007 Emission Factors: V2.3 Nov 1 2006

South Coast Basin Average Basin Average
South Coast

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Total Organic Gases Temperature: 70F Relative Humidity: 50%

Speed MPH	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL
0	25.03	24.633	3.612	23.521	24.642	24.633	3.612	15.798	25.375	24.633	3.612	7.509	0	0	20.678	18.996	22.796	23.242	12.521
5	20.452	4.561	0.541	4.574	20.181	2.985	0.761	2.344	31.014	5.7	0.825	2.007	97.242	17.745	17.418	17.678	30.195	5.21	9.473
10	13.405	2.99	0.424	3.003	13.228	1.957	0.598	1.578	20.325	3.738	0.648	1.403	63.721	11.631	10.009	10.293	19.789	3.416	5.524
15	9.159	2.044	0.341	2.055	9.038	1.338	0.48	1.109	13.886	2.556	0.52	1.022	43.526	7.948	4.975	5.321	13.52	2.335	2.837
20	6.524	1.457	0.279	1.467	6.438	0.954	0.393	0.812	9.889	1.823	0.427	0.774	30.991	5.662	2.607	2.93	9.628	1.664	1.558
25	4.845	1.082	0.234	1.091	4.78	0.709	0.33	0.619	7.342	1.355	0.358	0.608	23.002	4.204	2.114	2.339	7.148	1.236	1.269
30	3.75	0.838	0.201	0.846	3.7	0.549	0.283	0.491	5.682	1.05	0.307	0.495	17.796	3.255	1.724	1.891	5.532	0.957	1.042
35	3.026	0.677	0.176	0.684	2.986	0.443	0.248	0.404	4.584	0.848	0.269	0.417	14.352	2.626	1.437	1.568	4.463	0.773	0.874
40	2.545	0.569	0.158	0.576	2.511	0.373	0.222	0.346	3.854	0.713	0.241	0.363	12.065	2.209	1.253	1.36	3.753	0.65	0.765
45	2.231	0.499	0.144	0.505	2.202	0.327	0.203	0.307	3.378	0.626	0.221	0.326	10.572	1.937	1.172	1.26	3.289	0.57	0.714
50	2.038	0.456	0.135	0.462	2.011	0.299	0.19	0.282	3.086	0.572	0.206	0.302	9.655	1.77	1.194	1.264	3.005	0.521	0.719
55	1.941	0.434	0.129	0.44	1.915	0.285	0.182	0.269	2.938	0.545	0.198	0.288	9.192	1.685	1.32	1.371	2.861	0.496	0.78
60	1.926	0.431	0.127	0.436	1.901	0.282	0.178	0.266	2.916	0.54	0.193	0.284	9.121	1.672	1.548	1.58	2.839	0.492	0.897
65	1.992	0.446	0.127	0.451	1.965	0.292	0.178	0.273	3.015	0.559	0.193	0.288	9.434	1.729	1.879	1.889	2.936	0.509	1.07

Pollutant Name: PM10 Temperature: 70F Relative Humidity: 50%

Speed MPH	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL
0	0	0	1.176	0.063	0	0	1.331	0.56	0	0	1.3	1.059	0	0	3.295	3.027	0	0	2.34
5	0.101	0.052	0.158	0.059	0.101	0.045	0.199	0.111	0.101	0.055	0.955	0.789	0.101	0.093	4.746	4.367	0.101	0.054	2.849
10	0.066	0.034	0.124	0.04	0.066	0.03	0.156	0.083	0.066	0.036	0.749	0.618	0.066	0.061	3.248	2.989	0.066	0.035	1.987
15	0.045	0.023	0.1	0.028	0.045	0.02	0.125	0.065	0.045	0.025	0.601	0.495	0.045	0.042	2.151	1.979	0.045	0.024	1.357
20	0.032	0.017	0.082	0.02	0.032	0.014	0.103	0.052	0.032	0.018	0.493	0.406	0.032	0.03	1.52	1.398	0.032	0.017	0.985
25	0.024	0.012	0.068	0.016	0.024	0.011	0.086	0.043	0.024	0.013	0.414	0.34	0.024	0.022	1.279	1.177	0.024	0.013	0.829
30	0.019	0.01	0.059	0.012	0.019	0.008	0.074	0.036	0.019	0.01	0.355	0.291	0.019	0.017	1.09	1.003	0.019	0.01	0.707
35	0.015	0.008	0.051	0.01	0.015	0.007	0.065	0.031	0.015	0.008	0.311	0.255	0.015	0.014	0.952	0.876	0.015	0.008	0.618
40	0.013	0.007	0.046	0.009	0.013	0.006	0.058	0.028	0.013	0.007	0.278	0.228	0.013	0.012	0.865	0.795	0.013	0.007	0.56
45	0.011	0.006	0.042	0.008	0.011	0.005	0.053	0.025	0.011	0.006	0.255	0.209	0.011	0.01	0.828	0.762	0.011	0.006	0.532
50	0.01	0.005	0.04	0.007	0.01	0.005	0.05	0.024	0.01	0.005	0.239	0.196	0.01	0.009	0.843	0.775	0.01	0.005	0.533
55	0.01	0.005	0.038	0.007	0.01	0.004	0.048	0.023	0.01	0.005	0.228	0.187	0.01	0.009	0.909	0.836	0.01	0.005	0.564
60	0.009	0.005	0.037	0.007	0.009	0.004	0.047	0.022	0.009	0.005	0.223	0.183	0.009	0.009	1.026	0.943	0.009	0.005	0.623
65	0.01	0.005	0.037	0.007	0.01	0.004	0.047	0.022	0.01	0.005	0.223	0.183	0.01	0.009	1.194	1.098	0.01	0.005	0.71

Table 7: Estimated Travel Fractions

	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL
%VMT	0.005	0.31	0.018	0.333	0.002	0.058	0.043	0.103	0.003	0.043	0.204	0.25	0.001	0.025	0.289	0.314	0.01	0.436	0.553
%TRIP	0.012	0.507	0.008	0.527	0.005	0.092	0.026	0.123	0.028	0.09	0.19	0.308	0.007	0.018	0.017	0.042	0.051	0.707	0.242
%VEH	0.011	0.442	0.019	0.472	0.004	0.08	0.06	0.144	0.017	0.057	0.195	0.27	0.004	0.011	0.099	0.114	0.037	0.59	0.373
																	0.627	0.373	

Title: SCAG Truck Emission Factors - SR47 (edited to include Statewide Diesel Truck and Bus Regulation)
Version : Emfac2007 V2.3 Nov 1 2006

Scen Year: 2015 -- All model years in the range 1971 to 2015 selected
Season : Annual
Area : South Coast
****
Year: 2015 -- Model Years 1971 to 2015 Inclusive -- Annual
Year:
Emfac2007 Emission Factors: V2.3 Nov 1 2006

South Coast Basin Average Basin Average
South Coast

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Total Organic Gases Temperature: 70F Relative Humidity: 50%

Speed MPH	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL
0	22.544	23.579	3.612	19.746	22.544	23.636	3.612	15.026	22.544	23.644	3.612	7.018	0	0	11.253	10.986	21.335	23.003	7.89
5	18.464	1.193	0.413	1.074	18.464	0.635	0.543	0.609	27.691	1.467	0.518	0.705	86.13	16.656	8.005	8.22	24.379	1.528	4.701
10	12.103	0.782	0.324	0.715	12.103	0.417	0.426	0.429	18.148	0.962	0.406	0.518	56.44	10.918	4.413	4.573	15.978	1.002	2.643
15	8.27	0.535	0.26	0.496	8.27	0.285	0.342	0.315	12.399	0.658	0.326	0.394	38.552	7.46	2.1	2.231	10.917	0.685	1.314
20	5.891	0.381	0.213	0.359	5.891	0.203	0.281	0.241	8.831	0.469	0.268	0.31	27.451	5.314	1.147	1.249	7.775	0.488	0.756
25	4.374	0.283	0.179	0.27	4.374	0.151	0.235	0.19	6.556	0.348	0.224	0.252	20.374	3.946	0.944	1.018	5.773	0.362	0.624
30	3.386	0.219	0.153	0.212	3.386	0.117	0.202	0.156	5.074	0.27	0.192	0.21	15.763	3.055	0.78	0.835	4.468	0.281	0.518
35	2.733	0.177	0.134	0.173	2.733	0.094	0.177	0.132	4.094	0.218	0.169	0.181	12.713	2.465	0.654	0.698	3.605	0.226	0.437
40	2.298	0.149	0.12	0.147	2.298	0.079	0.158	0.115	3.442	0.184	0.151	0.16	10.687	2.073	0.567	0.603	3.032	0.191	0.381
45	2.015	0.13	0.11	0.13	2.015	0.07	0.145	0.103	3.017	0.161	0.138	0.145	9.365	1.817	0.518	0.55	2.658	0.167	0.349
50	1.841	0.119	0.103	0.119	1.841	0.064	0.136	0.096	2.756	0.147	0.129	0.135	8.553	1.66	0.508	0.537	2.428	0.153	0.339
55	1.753	0.114	0.099	0.114	1.753	0.061	0.13	0.092	2.624	0.14	0.124	0.129	8.143	1.581	0.537	0.563	2.312	0.145	0.353
60	1.74	0.113	0.097	0.112	1.74	0.06	0.127	0.09	2.604	0.139	0.121	0.127	8.08	1.569	0.605	0.628	2.294	0.144	0.39
65	1.799	0.116	0.097	0.116	1.799	0.062	0.127	0.091	2.693	0.144	0.121	0.128	8.357	1.622	0.711	0.733	2.372	0.149	0.449

Pollutant Name: PM10 Temperature: 70F Relative Humidity: 50%

Speed MPH	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	**MHD** DSL**	MHD ALL	HHD NCAT	HHD CAT	**HHD** DSL**	HHD ALL	ALL NCAT	ALL CAT	**ALL** DSL**
0	0	0	0.777	0.149	0	0	0.875	0.376	0	0	**0.772**	0.726	0	0	**0.301**	0.975	0	0	**0.515**
5	0.101	0.049	0.088	0.057	0.101	0.048	0.106	0.073	0.101	0.052	**0.379**	0.456	0.101	0.099	**0.198**	1.118	0.101	0.051	**0.234**
10	0.066	0.032	0.069	0.039	0.066	0.032	0.084	0.054	0.066	0.034	**0.297**	0.357	0.066	0.065	**0.182**	0.773	0.066	0.033	**0.199**
15	0.045	0.022	0.056	0.028	0.045	0.022	0.067	0.041	0.045	0.023	**0.239**	0.285	0.045	0.044	**0.165**	0.52	0.045	0.023	**0.170**
20	0.032	0.016	0.046	0.021	0.032	0.015	0.055	0.032	0.032	0.017	**0.196**	0.234	0.032	0.032	**0.151**	0.373	0.032	0.016	**0.148**
25	0.024	0.012	0.038	0.017	0.024	0.011	0.046	0.026	0.024	0.012	**0.164**	0.196	0.024	0.023	**0.147**	0.32	0.024	0.012	**0.136**
30	0.019	0.009	0.033	0.014	0.019	0.009	0.04	0.022	0.019	0.01	**0.141**	0.168	0.019	0.018	**0.149**	0.283	0.019	0.009	**0.129**
35	0.015	0.007	0.029	0.011	0.015	0.007	0.035	0.019	0.015	0.008	**0.123**	0.147	0.015	0.015	**0.157**	0.263	0.015	0.007	**0.128**
40	0.013	0.006	0.026	0.01	0.013	0.006	0.031	0.017	0.013	0.006	**0.11**	0.131	0.013	0.012	**0.172**	0.258	0.013	0.006	**0.132**
45	0.011	0.005	0.024	0.009	0.011	0.005	0.028	0.015	0.011	0.006	**0.101**	0.12	0.011	0.011	**0.192**	0.271	0.011	0.005	**0.140**
50	0.01	0.005	0.022	0.008	0.01	0.005	0.027	0.014	0.01	0.005	**0.095**	0.113	0.01	0.01	**0.218**	0.299	0.01	0.005	**0.153**
55	0.01	0.005	0.021	0.008	0.01	0.005	0.025	0.014	0.01	0.005	**0.091**	0.108	0.01	0.009	**0.25**	0.344	0.01	0.005	**0.170**
60	0.009	0.005	0.021	0.008	0.009	0.005	0.025	0.013	0.009	0.005	**0.089**	0.105	0.009	0.009	**0.288**	0.406	0.009	0.005	**0.190**
65	0.01	0.005	0.021	0.008	0.01	0.005	0.025	0.013	0.01	0.005	**0.089**	0.105	0.01	0.01	**0.333**	0.483	0.01	0.005	**0.216**

** Indicates Emission Factor Data that has been replaced with EMFAC values incorporating assumptions from Statewide Bus and Truck Regulation

Table 7: Estimated Travel Fractions

	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL
%VMT	0.001	0.252	0.06	0.313	0	0.052	0.039	0.091	0	0.038	0.186	0.224	0	0.009	0.363	0.372	0.001	0.351	0.648
%TRIP	0.002	0.477	0.042	0.521	0	0.1	0.029	0.129	0.003	0.091	0.22	0.314	0	0.013	0.023	0.037	0.006	0.68	0.314
%VEH	0.002	0.38	0.087	0.469	0	0.079	0.061	0.14	0.002	0.052	0.207	0.261	0	0.007	0.122	0.13	0.004	0.519	0.477

Title: SCAG Truck Emission Factors - SR47 (edited to include Statewide Diesel Truck and Bus Regulation)
Version : Emfac2007 V2.3 Nov 1 2006

Scen Year: 2030 -- All model years in the range 1986 to 2030 selected
Season : Annual
Area : South Coast
****

Emfac2007 Emission Factors: V2.3 Nov 1 2006

South Coast Basin Average Basin Average
South Coast

Pollutant Name: Total Organic Gases Temperature: 70F Relative Humidity: 50%

Speed MPH	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL
0	0	21.728	3.612	18.311	0	21.827	3.612	14.142	0	21.759	3.612	6.844	0	0	8.835	8.743	0	21.478	6.72
5	0	0.166	0.269	0.186	0	0.085	0.267	0.162	0	0.188	0.341	0.313	0	5.046	2.933	2.955	0	0.217	1.873
10	0	0.109	0.211	0.128	0	0.055	0.21	0.121	0	0.123	0.267	0.242	0	3.31	1.6	1.618	0	0.142	1.052
15	0	0.075	0.169	0.092	0	0.038	0.168	0.093	0	0.084	0.215	0.191	0	2.264	0.765	0.781	0	0.097	0.536
20	0	0.053	0.139	0.069	0	0.027	0.138	0.074	0	0.06	0.176	0.155	0	1.614	0.449	0.461	0	0.069	0.333
25	0	0.039	0.117	0.054	0	0.02	0.116	0.06	0	0.044	0.148	0.129	0	1.2	0.391	0.399	0	0.051	0.288
30	0	0.031	0.1	0.044	0	0.016	0.099	0.051	0	0.034	0.127	0.11	0	0.93	0.34	0.346	0	0.04	0.25
35	0	0.025	0.088	0.037	0	0.013	0.087	0.044	0	0.028	0.111	0.096	0	0.751	0.296	0.301	0	0.032	0.218
40	0	0.021	0.078	0.032	0	0.011	0.078	0.039	0	0.023	0.099	0.086	0	0.632	0.26	0.264	0	0.027	0.192
45	0	0.018	0.072	0.028	0	0.009	0.071	0.035	0	0.021	0.091	0.078	0	0.555	0.231	0.235	0	0.024	0.172
50	0	0.017	0.067	0.026	0	0.008	0.067	0.033	0	0.019	0.085	0.073	0	0.507	0.21	0.213	0	0.022	0.157
55	0	0.016	0.064	0.025	0	0.008	0.064	0.032	0	0.018	0.082	0.07	0	0.483	0.195	0.198	0	0.021	0.147
60	0	0.016	0.063	0.025	0	0.008	0.063	0.031	0	0.018	0.08	0.069	0	0.479	0.188	0.191	0	0.02	0.142
65	0	0.016	0.063	0.025	0	0.008	0.063	0.031	0	0.018	0.08	0.069	0	0.495	0.189	0.192	0	0.021	0.142

Pollutant Name: PM10 Temperature: 70F Relative Humidity: 50%

Speed MPH	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	**MHD** DSL**	MHD ALL	HHD NCAT	HHD CAT	**HHD** DSL**	HHD ALL	ALL NCAT	ALL CAT	**ALL** DSL**
0	0	0	0.791	0.149	0	0	0.809	0.341	0	0	**0.801**	0.663	0	0	**0.11**	0.166	0	0	**0.390**
5	0	0.053	0.063	0.055	0	0.05	0.061	0.055	0	0.054	**0.322**	0.298	0	0.089	**0.093**	0.114	0	0.053	**0.149**
10	0	0.035	0.05	0.037	0	0.033	0.048	0.039	0	0.036	**0.253**	0.233	0	0.059	**0.085**	0.099	0	0.035	**0.124**
15	0	0.024	0.04	0.027	0	0.022	0.039	0.029	0	0.024	**0.203**	0.186	0	0.04	**0.077**	0.087	0	0.024	**0.105**
20	0	0.017	0.033	0.02	0	0.016	0.032	0.023	0	0.017	**0.166**	0.152	0	0.028	**0.071**	0.078	0	0.017	**0.090**
25	0	0.012	0.027	0.015	0	0.012	0.027	0.018	0	0.013	**0.139**	0.127	0	0.021	**0.069**	0.075	0	0.013	**0.081**
30	0	0.01	0.024	0.012	0	0.009	0.023	0.015	0	0.01	**0.12**	0.109	0	0.016	**0.07**	0.075	0	0.01	**0.076**
35	0	0.008	0.021	0.01	0	0.007	0.02	0.013	0	0.008	**0.105**	0.095	0	0.013	**0.073**	0.079	0	0.008	**0.074**
40	0	0.007	0.018	0.009	0	0.006	0.018	0.011	0	0.007	**0.094**	0.085	0	0.011	**0.08**	0.085	0	0.007	**0.075**
45	0	0.006	0.017	0.008	0	0.005	0.016	0.01	0	0.006	**0.086**	0.078	0	0.01	**0.089**	0.095	0	0.006	**0.078**
50	0	0.005	0.016	0.007	0	0.005	0.015	0.009	0	0.005	**0.08**	0.073	0	0.009	**0.102**	0.108	0	0.005	**0.084**
55	0	0.005	0.015	0.007	0	0.005	0.015	0.009	0	0.005	**0.077**	0.07	0	0.008	**0.117**	0.124	0	0.005	**0.092**
60	0	0.005	0.015	0.007	0	0.005	0.014	0.009	0	0.005	**0.075**	0.068	0	0.008	**0.135**	0.143	0	0.005	**0.102**
65	0	0.005	0.015	0.007	0	0.005	0.014	0.009	0	0.005	**0.075**	0.068	0	0.009	**0.155**	0.165	0	0.005	**0.114**

** Indicates Emission Factor Data that has been replaced with EMFAC values incorporating assumptions from Statewide Bus and Truck Regulation

Table 7: Estimated Travel Fractions

Pollutant Name: Temperature: ALL Relative Humidity: ALL

Pollutant Name:

	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL
%VMT	0	0.245	0.057	0.302	0	0.052	0.038	0.089	0	0.038	0.174	0.211	0	0.004	0.394	0.398	0	0.338	0.662
%TRIP	0	0.483	0.043	0.526	0	0.102	0.029	0.13	0	0.093	0.22	0.313	0	0.006	0.025	0.031	0	0.684	0.316
%VEH	0	0.382	0.089	0.471	0	0.08	0.059	0.14	0	0.053	0.205	0.258	0	0.003	0.129	0.132	0	0.519	0.481

Title : SCAG Trucks - SR47
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/10/01 14:42:47
Scen Year: 2015 -- All model years in the range 2003 to 2015 selected
Season : Annual
Area : South Coast
****
Year:2015 -- Model Years 2003 to 2015, Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

South Coast Basin Average Basin Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: PM10 Temperature: 70F Relative Humidity: 50%

Speed MPH	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	**MHD** DSL**	MHD ALL	HHD NCAT	HHD CAT	**HHD ** DSL**	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
0	0	0	0.76	0.171	0	0	0.769	0.335	0	0	**0.772**	0.639	0	0	**0.301**	0.297	0	0	0.508	0.336
5	0	0.037	0.084	0.047	0	0.035	0.069	0.05	0	0.042	**0.379**	0.321	0	0.089	**0.198**	0.197	0	0.038	0.229	0.165
10	0	0.024	0.066	0.033	0	0.023	0.055	0.037	0	0.028	**0.297**	0.251	0	0.059	**0.182**	0.18	0	0.025	0.194	0.137
15	0	0.016	0.053	0.025	0	0.016	0.044	0.028	0	0.019	**0.239**	0.201	0	0.04	**0.165**	0.163	0	0.017	0.167	0.116
20	0	0.012	0.043	0.019	0	0.011	0.036	0.022	0	0.013	**0.196**	0.164	0	0.028	**0.151**	0.15	0	0.012	0.146	0.101
25	0	0.009	0.036	0.015	0	0.008	0.03	0.018	0	0.01	**0.164**	0.138	0	0.021	**0.147**	0.146	0	0.009	0.134	0.091
30	0	0.007	0.031	0.012	0	0.006	0.026	0.015	0	0.008	**0.141**	0.118	0	0.016	**0.149**	0.147	0	0.007	0.127	0.087
35	0	0.005	0.027	0.01	0	0.005	0.023	0.013	0	0.006	**0.123**	0.103	0	0.013	**0.157**	0.155	0	0.006	0.126	0.086
40	0	0.005	0.024	0.009	0	0.004	0.02	0.011	0	0.005	**0.11**	0.092	0	0.011	**0.172**	0.169	0	0.005	0.13	0.088
45	0	0.004	0.022	0.008	0	0.004	0.019	0.01	0	0.005	**0.101**	0.085	0	0.01	**0.192**	0.189	0	0.004	0.139	0.093
50	0	0.004	0.021	0.008	0	0.003	0.017	0.01	0	0.004	**0.095**	0.079	0	0.009	**0.218**	0.215	0	0.004	0.151	0.101
55	0	0.003	0.02	0.007	0	0.003	0.017	0.009	0	0.004	**0.091**	0.076	0	0.008	**0.25**	0.247	0	0.004	0.168	0.112
60	0	0.003	0.02	0.007	0	0.003	0.016	0.009	0	0.004	**0.089**	0.074	0	0.008	**0.288**	0.284	0	0.004	0.189	0.126
65	0	0.004	0.02	0.007	0	0.003	0.016	0.009	0	0.004	**0.089**	0.074	0	0.009	**0.333**	0.328	0	0.004	0.213	0.143

**** Indicates MHD and HHD truck emission factor data used to modify SCAG Profile to Account for ARB Statewide Bus and Truck Rule**

Title : SCAG Trucks - SR47
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/10/01 14:50:13
Scen Year: 2030 -- All model years in the range 2007 to 2030 selected
Season : Annual
Area : South Coast
****

Year:2030 -- Model Years 2007 to 2030, Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

South Coast ,Basin Average Basin Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: PM10 Temperature: 70F Relative Humidity: 50%

Speed MPH	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	**MHD** DSL**	MHD ALL	HHD NCAT	HHD CAT	**HHD** DSL**	HHD ALL	OBUS NCAT	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
0	0	0	0.8	0.149	0	0	0.801	0.334	0	0	**0.801**	0.657	0	0	**0.11**	0.109	0	0	0	0.383	0.257
5	0	0.049	0.052	0.049	0	0.047	0.049	0.048	0	0.053	**0.322**	0.274	0	0.087	**0.093**	0.093	0	0	0.049	0.146	0.114
10	0	0.032	0.041	0.034	0	0.031	0.039	0.034	0	0.035	**0.253**	0.214	0	0.057	**0.085**	0.084	0	0	0.032	0.122	0.093
15	0	0.022	0.033	0.024	0	0.021	0.031	0.025	0	0.024	**0.203**	0.171	0	0.039	**0.077**	0.077	0	0	0.022	0.104	0.077
20	0	0.016	0.027	0.018	0	0.015	0.026	0.019	0	0.017	**0.166**	0.14	0	0.028	**0.071**	0.07	0	0	0.016	0.089	0.065
25	0	0.012	0.023	0.014	0	0.011	0.021	0.015	0	0.013	**0.139**	0.117	0	0.021	**0.069**	0.068	0	0	0.012	0.081	0.058
30	0	0.009	0.019	0.011	0	0.009	0.018	0.013	0	0.01	**0.12**	0.1	0	0.016	**0.07**	0.069	0	0	0.009	0.076	0.054
35	0	0.007	0.017	0.009	0	0.007	0.016	0.011	0	0.008	**0.105**	0.087	0	0.013	**0.073**	0.073	0	0	0.007	0.074	0.052
40	0	0.006	0.015	0.008	0	0.006	0.014	0.009	0	0.007	**0.094**	0.078	0	0.011	**0.08**	0.079	0	0	0.006	0.075	0.052
45	0	0.005	0.014	0.007	0	0.005	0.013	0.008	0	0.006	**0.086**	0.072	0	0.009	**0.089**	0.089	0	0	0.005	0.078	0.054
50	0	0.005	0.013	0.006	0	0.005	0.012	0.008	0	0.005	**0.08**	0.067	0	0.009	**0.102**	0.101	0	0	0.005	0.084	0.058
55	0	0.005	0.012	0.006	0	0.004	0.012	0.008	0	0.005	**0.077**	0.064	0	0.008	**0.117**	0.116	0	0	0.005	0.092	0.063
60	0	0.005	0.012	0.006	0	0.004	0.012	0.007	0	0.005	**0.075**	0.063	0	0.008	**0.135**	0.133	0	0	0.005	0.103	0.07
65	0	0.005	0.012	0.006	0	0.005	0.012	0.007	0	0.005	**0.075**	0.063	0	0.008	**0.155**	0.154	0	0	0.005	0.115	0.079

**** Indicates MHD and HHD truck emission factor data used to modify SCAG Profile to Account for ARB Statewide Bus and Truck Rule**

Title : Port Trucks - All Meet 2007 Standards
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/01/31 00:19:22
Scen Year: 2015 -- All model years in the range 2007 to 2015 selected
Season : Annual
Area : South Coast
****

2015 -- Model Years 2007 to 2015 Inclusive -- Annual

Emfac2007 Emission Factors: V2.3 Nov 1 2006

South Coast Basin Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Total Organic Gases Temperature: 70F Relative Humidity: 50%

Speed MPH	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL CAT	ALL DSL	ALL ALL
0	0	0	8.711	8.62	0	8.711	8.62
5	0	2.526	3.017	3.012	2.526	3.017	3.012
10	0	1.658	1.645	1.645	1.658	1.645	1.645
15	0	1.136	0.787	0.791	1.136	0.787	0.791
20	0	0.811	0.463	0.467	0.811	0.463	0.467
25	0	0.604	0.404	0.406	0.604	0.404	0.406
30	0	0.469	0.352	0.354	0.469	0.352	0.354
35	0	0.379	0.308	0.308	0.379	0.308	0.308
40	0	0.319	0.27	0.271	0.319	0.27	0.271
45	0	0.28	0.24	0.24	0.28	0.24	0.24
50	0	0.256	0.217	0.217	0.256	0.217	0.217
55	0	0.244	0.201	0.201	0.244	0.201	0.201
60	0	0.242	0.192	0.193	0.242	0.192	0.193
65	0	0.25	0.19	0.191	0.25	0.19	0.191

Pollutant Name: PM10 Temperature: 70F Relative Humidity: 50%

Speed MPH	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL CAT	ALL DSL	ALL ALL
0	0	0	0.11	0.109	0	0.11	0.109
5	0	0.076	0.081	0.081	0.076	0.081	0.081
10	0	0.05	0.074	0.074	0.05	0.074	0.074
15	0	0.034	0.067	0.067	0.034	0.067	0.067
20	0	0.024	0.062	0.061	0.024	0.062	0.061
25	0	0.018	0.06	0.06	0.018	0.06	0.06
30	0	0.014	0.061	0.06	0.014	0.061	0.06
35	0	0.011	0.064	0.064	0.011	0.064	0.064
40	0	0.009	0.07	0.069	0.009	0.07	0.069
45	0	0.008	0.078	0.077	0.008	0.078	0.077
50	0	0.008	0.089	0.088	0.008	0.089	0.088
55	0	0.007	0.102	0.101	0.007	0.102	0.101
60	0	0.007	0.118	0.116	0.007	0.118	0.116
65	0	0.007	0.136	0.134	0.007	0.136	0.134

Table 7: Estimated Travel Fractions

Pollutant Name: Temperature: ALL Relative Humidity: ALL

	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL CAT	ALL DSL	ALL ALL
%VMT	0	0.01	0.99	1	0.01	0.99	1
%TRIP	0	0.124	0.876	1	0.124	0.876	1
%VEH	0	0.015	0.985	1	0.015	0.985	1

Title : Port Trucks - All Meet 2007 Standards
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/01/31 00:19:22
Scen Year: 2030 -- All model years in the range 2007 to 2030 selected
Season : Annual
Area : South Coast
****
Year: 2030 -- Model Years 2007 to 2030 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

South Coast Basin Average Basin Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Total Organic Gases Temperature: 70F Relative Humidity: 50%

Speed MPH	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL CAT	ALL DSL	ALL ALL
0	0	0	8.711	8.628	0	8.711	8.628
5	0	2.95	2.809	2.81	2.95	2.809	2.81
10	0	1.936	1.531	1.535	1.936	1.531	1.535
15	0	1.326	0.733	0.739	1.326	0.733	0.739
20	0	0.946	0.431	0.436	0.946	0.431	0.436
25	0	0.704	0.376	0.379	0.704	0.376	0.379
30	0	0.547	0.328	0.33	0.547	0.328	0.33
35	0	0.442	0.286	0.288	0.442	0.286	0.288
40	0	0.372	0.252	0.253	0.372	0.252	0.253
45	0	0.327	0.223	0.224	0.327	0.223	0.224
50	0	0.299	0.202	0.203	0.299	0.202	0.203
55	0	0.285	0.187	0.188	0.285	0.187	0.188
60	0	0.282	0.179	0.18	0.282	0.179	0.18
65	0	0.292	0.177	0.178	0.292	0.177	0.178

Pollutant Name: PM10 Temperature: 70F Relative Humidity: 50%

Speed MPH	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL CAT	ALL DSL	ALL ALL
0	0	0	0.11	0.109	0	0.11	0.109
5	0	0.087	0.093	0.093	0.087	0.093	0.093
10	0	0.057	0.085	0.084	0.057	0.085	0.084
15	0	0.039	0.077	0.077	0.039	0.077	0.077
20	0	0.028	0.071	0.07	0.028	0.071	0.07
25	0	0.021	0.069	0.068	0.021	0.069	0.068
30	0	0.016	0.07	0.069	0.016	0.07	0.069
35	0	0.013	0.073	0.073	0.013	0.073	0.073
40	0	0.011	0.08	0.079	0.011	0.08	0.079
45	0	0.009	0.089	0.089	0.009	0.089	0.089
50	0	0.009	0.102	0.101	0.009	0.102	0.101
55	0	0.008	0.117	0.116	0.008	0.117	0.116
60	0	0.008	0.135	0.133	0.008	0.135	0.133
65	0	0.008	0.155	0.154	0.008	0.155	0.154

Table 7: Estimated Travel Fractions

Pollutant Name: Temperature: ALL Relative Humidity: ALL

	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL CAT	ALL DSL	ALL ALL
%VMT	0	0.01	0.99	1	0.01	0.99	1
%TRIP	0	0.117	0.883	1	0.117	0.883	1
%VEH	0	0.015	0.985	1	0.015	0.985	1

Title : Auto Emission Rates - SR47
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/01/31 00:27:10
Scen Year: 2003 -- All model years in the range 1965 to 2003 selected
Season : Annual
Area : South Coast
****
Year: 2003 -- Model Years 1965 to 2003 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

South Coast Basin Average Basin Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Total Organic Gases Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	17.635	0.804	0.66	1.078	18.72	0.67	0.264	1.48	17.315	0.919	0.457	1.081	22.347	1.093	0.252	1.401	18.292	0.854	0.393	1.15
10	12.561	0.543	0.518	0.739	13.334	0.458	0.207	1.037	12.334	0.625	0.359	0.741	15.917	0.743	0.198	0.963	13.029	0.578	0.309	0.79
15	9.364	0.384	0.416	0.531	9.94	0.328	0.166	0.762	9.194	0.447	0.288	0.533	11.864	0.531	0.159	0.695	9.712	0.411	0.248	0.57
20	7.304	0.286	0.341	0.401	7.753	0.246	0.136	0.586	7.172	0.334	0.236	0.402	9.254	0.397	0.13	0.526	7.576	0.307	0.203	0.431
25	5.963	0.223	0.286	0.317	6.329	0.194	0.114	0.472	5.855	0.262	0.198	0.317	7.554	0.312	0.109	0.417	6.184	0.24	0.17	0.342
30	5.093	0.182	0.245	0.262	5.406	0.159	0.098	0.397	5.001	0.214	0.17	0.262	6.452	0.256	0.094	0.346	5.283	0.196	0.146	0.284
35	4.552	0.156	0.215	0.228	4.832	0.137	0.086	0.35	4.47	0.184	0.149	0.226	5.767	0.22	0.082	0.301	4.722	0.168	0.128	0.246
40	4.258	0.139	0.193	0.207	4.519	0.123	0.077	0.323	4.181	0.164	0.133	0.204	5.393	0.198	0.074	0.274	4.416	0.151	0.115	0.224
45	4.167	0.13	0.176	0.196	4.422	0.115	0.07	0.311	4.091	0.154	0.122	0.193	5.278	0.186	0.067	0.26	4.321	0.141	0.105	0.213
50	4.266	0.128	0.165	0.195	4.528	0.113	0.066	0.314	4.189	0.15	0.114	0.19	5.404	0.183	0.063	0.259	4.425	0.138	0.098	0.212
55	4.571	0.131	0.158	0.204	4.851	0.116	0.063	0.331	4.488	0.154	0.109	0.197	5.79	0.189	0.06	0.27	4.741	0.142	0.094	0.221
60	5.124	0.141	0.155	0.223	5.439	0.125	0.062	0.366	5.031	0.164	0.107	0.213	6.491	0.204	0.059	0.296	5.314	0.153	0.092	0.241
65	6.01	0.159	0.155	0.255	6.38	0.14	0.062	0.423	5.902	0.184	0.107	0.241	7.614	0.231	0.059	0.338	6.234	0.172	0.092	0.276

Table 7: Estimated Travel Fractions

Pollutant Name: Temperature: ALL Relative Humidity: ALL

	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
%VMT	0.009	0.544	0.002	0.555	0.004	0.08	0.004	0.089	0.002	0.243	0.001	0.246	0.002	0.108	0.001	0.11	0.017	0.975	0.008	1
%TRIP	0.013	0.57	0.003	0.587	0.004	0.074	0.004	0.082	0.003	0.227	0.001	0.23	0.002	0.098	0.001	0.101	0.023	0.969	0.008	1
%VEH	0.019	0.566	0.003	0.589	0.006	0.073	0.004	0.083	0.004	0.224	0.001	0.228	0.003	0.097	0.001	0.1	0.032	0.96	0.008	1

Title : Auto Emission Rates - SR47
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/01/31 00:27:10
Scen Year: 2015 -- All model years in the range 1971 to 2015 selected
Season : Annual
Area : South Coast
****
Year: 2015 -- Model Years 1971 to 2015 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

South Coast Basin Average Basin Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Total Organic Gases Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	19.249	0.216	0.495	0.236	20.804	0.268	0.231	0.354	20.207	0.315	0.323	0.335	25.594	0.428	0.22	0.49	21.095	0.272	0.282	0.302
10	13.711	0.143	0.388	0.157	14.818	0.179	0.181	0.241	14.393	0.21	0.253	0.225	18.229	0.285	0.173	0.329	15.025	0.181	0.222	0.203
15	10.22	0.1	0.312	0.11	11.045	0.126	0.145	0.173	10.728	0.147	0.203	0.158	13.587	0.2	0.139	0.233	11.2	0.127	0.178	0.143
20	7.972	0.073	0.256	0.082	8.616	0.094	0.119	0.13	8.369	0.109	0.167	0.117	10.598	0.147	0.114	0.173	8.736	0.093	0.146	0.106
25	6.508	0.056	0.214	0.063	7.033	0.073	0.1	0.103	6.831	0.084	0.14	0.091	8.65	0.114	0.095	0.135	7.131	0.072	0.122	0.082
30	5.559	0.046	0.184	0.052	6.007	0.059	0.086	0.085	5.835	0.068	0.12	0.074	7.389	0.093	0.082	0.111	6.091	0.058	0.105	0.067
35	4.968	0.039	0.161	0.044	5.369	0.051	0.075	0.074	5.215	0.058	0.105	0.064	6.604	0.079	0.072	0.095	5.444	0.05	0.092	0.058
40	4.647	0.035	0.144	0.04	5.021	0.045	0.067	0.067	4.877	0.052	0.094	0.057	6.176	0.071	0.064	0.086	5.091	0.045	0.082	0.052
45	4.547	0.033	0.132	0.037	4.914	0.043	0.062	0.063	4.773	0.049	0.086	0.054	6.043	0.066	0.059	0.081	4.982	0.042	0.075	0.049
50	4.656	0.032	0.124	0.037	5.031	0.042	0.058	0.063	4.887	0.048	0.081	0.053	6.188	0.066	0.055	0.081	5.102	0.041	0.071	0.049
55	4.988	0.033	0.118	0.038	5.391	0.043	0.055	0.066	5.236	0.049	0.077	0.055	6.63	0.068	0.053	0.084	5.466	0.042	0.068	0.051
60	5.592	0.036	0.116	0.042	6.043	0.047	0.054	0.072	5.87	0.053	0.076	0.059	7.433	0.074	0.052	0.092	6.128	0.046	0.066	0.055
65	6.56	0.042	0.116	0.048	7.089	0.053	0.054	0.083	6.886	0.061	0.076	0.068	8.72	0.084	0.052	0.106	7.188	0.053	0.066	0.063

Table 7: Estimated Travel Fractions

Pollutant Name: Temperature: ALL Relative Humidity: ALL

	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
%VMT	0.001	0.534	0	0.535	0	0.08	0.001	0.082	0	0.262	0	0.263	0	0.121	0	0.121	0.001	0.996	0.002	1
%TRIP	0.001	0.552	0.001	0.554	0	0.076	0.002	0.078	0	0.251	0	0.252	0	0.116	0	0.117	0.002	0.996	0.003	1
%VEH	0.001	0.551	0.001	0.553	0.001	0.076	0.002	0.078	0	0.251	0	0.252	0.001	0.116	0	0.117	0.003	0.994	0.003	1

Title : Auto Emission Rates - SR47
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/01/31 00:27:10
Scen Year: 2030 -- All model years in the range 1986 to 2030 selected
Season : Annual
Area : South Coast
****
Year: 2030 -- Model Years 1986 to 2030 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

South Coast Basin Average Basin Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Total Organic Gases Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0.082	0.216	0.082	0	0.102	0.202	0.102	0	0.159	0.225	0.159	0	0.198	0.185	0.198	0	0.119	0.202	0.119
10	0	0.054	0.17	0.054	0	0.067	0.159	0.067	0	0.104	0.177	0.104	0	0.13	0.145	0.13	0	0.078	0.159	0.078
15	0	0.037	0.136	0.037	0	0.046	0.127	0.046	0	0.072	0.142	0.072	0	0.089	0.116	0.089	0	0.054	0.127	0.054
20	0	0.027	0.112	0.027	0	0.033	0.105	0.034	0	0.052	0.116	0.052	0	0.065	0.096	0.065	0	0.039	0.104	0.039
25	0	0.02	0.094	0.02	0	0.026	0.088	0.026	0	0.04	0.097	0.04	0	0.05	0.08	0.05	0	0.03	0.088	0.03
30	0	0.016	0.08	0.016	0	0.021	0.075	0.021	0	0.032	0.084	0.032	0	0.04	0.069	0.04	0	0.024	0.075	0.024
35	0	0.014	0.07	0.014	0	0.017	0.066	0.018	0	0.027	0.073	0.027	0	0.034	0.06	0.034	0	0.02	0.066	0.02
40	0	0.012	0.063	0.012	0	0.016	0.059	0.016	0	0.024	0.066	0.024	0	0.03	0.054	0.03	0	0.018	0.059	0.018
45	0	0.012	0.058	0.012	0	0.015	0.054	0.015	0	0.023	0.06	0.023	0	0.028	0.049	0.028	0	0.017	0.054	0.017
50	0	0.011	0.054	0.011	0	0.014	0.051	0.014	0	0.022	0.056	0.022	0	0.028	0.046	0.028	0	0.017	0.05	0.017
55	0	0.012	0.052	0.012	0	0.015	0.048	0.015	0	0.023	0.054	0.023	0	0.029	0.044	0.029	0	0.017	0.048	0.017
60	0	0.013	0.051	0.013	0	0.016	0.047	0.016	0	0.025	0.053	0.025	0	0.032	0.043	0.032	0	0.019	0.047	0.019
65	0	0.015	0.051	0.015	0	0.019	0.047	0.019	0	0.029	0.053	0.029	0	0.037	0.043	0.037	0	0.022	0.047	0.022

Table 7: Estimated Travel Fractions

Pollutant Name: Temperature: ALL Relative Humidity: ALL

	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
%VMT	0	0.52	0	0.52	0	0.083	0	0.083	0	0.271	0	0.271	0	0.127	0	0.127	0	1	0	1
%TRIP	0	0.54	0	0.54	0	0.078	0	0.078	0	0.259	0	0.259	0	0.123	0	0.123	0	1	0	1
%VEH	0	0.537	0	0.537	0	0.079	0	0.079	0	0.26	0	0.26	0	0.124	0	0.124	0	1	0	1

Draft LNG Ports Truck Emission Factors for MY 2008 +
Revised March 5 2008

EMFAC LNG only

Model Year	HC		CO		NOx		PM		DPM	
	ZMR	DR	ZMR	DR	ZMR	DR	ZMR	DR	ZMR	DR
2008	0.26	0.008	0.74	0.022	4.56	0.031	0.035	0.001	0.00175	0.00005
2009	0.26	0.008	0.74	0.022	4.56	0.031	0.035	0.001	0.00175	0.00005
2010+	0.21	0.004	0.61	0.012	1.14	0.041	0.035	0.001	0.00175	0.00005

LNG EFs for 2008 and 2009 are based on Cummins Westport LNG Engines certified to 0.8 gms/hp-hr NOx and 0.01 gms/hp-hr PM which uses 5% diesel fuel
LNG EFs for 2010+ Model Years are based on Cummins Westport LNG Engines certified to 0.2 gms/hp-hr NOx and 0.01 gms/hp-hr PM which uses 5% diesel fuel
* ZMR = Zero Mile Emission Rate (g/mile)
DR = Deterioration Rate per 10,000 mile

EMFAC2007 Default Fleet Data for Heavy HD Diesel Trucks

South Coast Air Basin	**Year 2008 Fleet**			
Vehicle Age (Years)	Vehicle Population	Annual Mileage	Accumulated Mileage per Vehicle	Accumulated Mileage, All Vehicles
Age01	1,791	93,214	93,214	166,958,428
Age02	1,692	98,350	191,563	324,154,288
Age03	1,672	99,860	291,423	487,208,840
Age04	1,545	98,620	390,043	602,599,273
Age05	1,120	95,369	485,412	543,714,275
Age06	1,353	90,721	576,132	779,680,926
Age07	1,101	85,186	661,318	728,373,275
Age08	1,693	79,170	740,488	1,253,415,892
Age09	2,380	72,994	813,482	1,935,777,818
Age10	2,361	66,904	880,386	2,078,457,237
Age11	1,947	61,077	941,463	1,832,947,040
Age12	1,912	55,635	997,098	1,906,832,267
Age13	2,134	50,651	1,047,749	2,235,989,082
Age14	2,308	46,159	1,093,908	2,524,210,213
Age15	1,780	42,162	1,136,070	2,022,739,244
Age16	1,337	38,637	1,174,706	1,571,081,506
Age17	951	35,541	1,210,248	1,150,396,646
Age18	1,053	32,821	1,243,069	1,309,106,777
Age19	1,354	30,417	1,273,486	1,724,650,849
Age20	1,305	28,261	1,301,747	1,699,008,616
Age21	926	26,292	1,328,039	1,229,416,832
Age22	772	24,452	1,352,491	1,044,172,476
Age23	640	22,690	1,375,181	880,267,637
Total	35,128			30,031,159,441
Average Milage				**854,910**

Emission Factors for LNG Trucks

2008 Model Year Trucks			
Year	**HC (g/mile)**	**PM (g/mile)**	**DPM (g/mile)**
2008	0.335	0.044	0.00222
2009	0.413	0.054	0.00271
2010	0.493	0.064	0.00321
2011	0.572	0.074	0.00370
2012	0.648	0.084	0.00418
2013	0.721	0.093	0.00463
2014	0.789	0.101	0.00506
2015	**0.852**	**0.109**	**0.00545**
2016	0.911	0.116	0.00582
2017	0.944	0.120	0.00602
2018	0.944	0.120	0.00602
2019	0.944	0.120	0.00602
2020	0.944	0.120	0.00602
2021	0.944	0.120	0.00602
2022	0.944	0.120	0.00602
2023	0.944	0.120	0.00602
2024	0.944	0.120	0.00602
2025	0.944	0.120	0.00602
2026	0.944	0.120	0.00602
2027	0.944	0.120	0.00602
2028	0.944	0.120	0.00602
2029	0.944	0.120	0.00602
2030	**0.944**	**0.120**	**0.00602**

EMFAC2007 Default Fleet Data for Heavy HD Diesel Trucks

South Coast Air Basin	Year 2009 Fleet			
Vehicle Age (Years)	Vehicle Population	Annual Mileage	Accumulated Mileage per Vehicle	Accumulated Mileage, All Vehicles
Age01	1,970	93,214	93,214	183,654,085
Age02	1,857	98,350	191,563	355,744,559
Age03	1,712	99,860	291,423	499,006,517
Age04	1,734	98,620	390,043	676,165,283
Age05	1,602	95,369	485,412	777,569,032
Age06	1,161	90,721	576,132	669,106,744
Age07	1,403	85,186	661,318	927,939,284
Age08	1,142	79,170	740,488	845,621,005
Age09	1,744	72,994	813,482	1,418,636,577
Age10	2,442	66,904	880,386	2,149,993,902
Age11	2,429	61,077	941,463	2,286,812,351
Age12	1,938	55,635	997,098	1,932,090,754
Age13	1,897	50,651	1,047,749	1,987,543,755
Age14	2,085	46,159	1,093,908	2,280,975,393
Age15	2,216	42,162	1,136,070	2,517,969,089
Age16	1,676	38,637	1,174,706	1,968,918,097
Age17	1,285	35,541	1,210,248	1,555,257,596
Age18	901	32,821	1,243,069	1,120,315,462
Age19	983	30,417	1,273,486	1,251,962,576
Age20	1,238	28,261	1,301,747	1,611,762,945
Age21	1,175	26,292	1,328,039	1,560,092,567
Age22	815	24,452	1,352,491	1,102,663,665
Total	35,407			29,679,801,240
Average Milage				**838,258**

Emission Factors for LNG Trucks

2009 Model Year Trucks			
Year	**HC (g/mile)**	**PM10 (g/mile)**	**DPM (g/mile)**
2009	0.335	0.044	0.00222
2010	0.413	0.054	0.00271
2011	0.493	0.064	0.00321
2012	0.572	0.074	0.00370
2013	0.648	0.084	0.00418
2014	0.721	0.093	0.00463
2015	**0.789**	**0.101**	**0.00506**
2016	0.852	0.109	0.00545
2017	0.911	0.116	0.00582
2018	0.931	0.119	0.00594
2019	0.931	0.119	0.00594
2020	0.931	0.119	0.00594
2021	0.931	0.119	0.00594
2022	0.931	0.119	0.00594
2023	0.931	0.119	0.00594
2024	0.931	0.119	0.00594
2025	0.931	0.119	0.00594
2026	0.931	0.119	0.00594
2027	0.931	0.119	0.00594
2028	0.931	0.119	0.00594
2029	0.931	0.119	0.00594
2030	**0.931**	**0.119**	**0.00594**

EMFAC2007 Default Fleet Data for Heavy HD Diesel Trucks

South Coast Air Basin	Year 2010 Fleet			
Vehicle Age (Years)	Vehicle Population	Annual Mileage	Accumulated Mileage per Vehicle	Accumulated Mileage, All Vehicles
Age01	2,167	93,214	93,214	202,019,568
Age02	2,038	98,350	191,563	390,494,854
Age03	1,875	99,860	291,423	546,486,901
Age04	1,772	98,620	390,043	691,018,121
Age05	1,794	95,369	485,412	870,768,040
Age06	1,657	90,721	576,132	954,905,213
Age07	1,202	85,186	661,318	794,680,350
Age08	1,452	79,170	740,488	1,075,072,319
Age09	1,174	72,994	813,482	955,102,188
Age10	1,786	66,904	880,386	1,572,346,072
Age11	2,507	61,077	941,463	2,360,603,299
Age12	2,412	55,635	997,098	2,405,495,934
Age13	1,918	50,651	1,047,749	2,009,685,830
Age14	1,850	46,159	1,093,908	2,023,316,303
Age15	1,999	42,162	1,136,070	2,270,619,439
Age16	2,082	38,637	1,174,706	2,445,862,931
Age17	1,607	35,541	1,210,248	1,945,042,008
Age18	1,216	32,821	1,243,069	1,511,433,619
Age19	840	30,417	1,273,486	1,069,191,937
Age20	897	28,261	1,301,747	1,167,581,831
Age21	1,112	26,292	1,328,039	1,476,904,204
Total	35,358			28,738,630,960
Average Milage				**812,801**

Emission Factors for LNG Trucks

2010 Model Year Trucks			
Year	**HC (g/mile)**	**PM10 (g/mile)**	**DPM (g/mile)**
2010	0.247	0.044	0.00222
2011	0.287	0.054	0.00271
2012	0.327	0.064	0.00321
2013	0.366	0.074	0.00370
2014	0.404	0.084	0.00418
2015	**0.440**	**0.093**	**0.00463**
2016	0.475	0.101	0.00506
2017	0.506	0.109	0.00545
2018	0.535	0.116	0.00581
2019	0.535	0.116	0.00581
2020	0.535	0.116	0.00581
2021	0.535	0.116	0.00581
2022	0.535	0.116	0.00581
2023	0.535	0.116	0.00581
2024	0.535	0.116	0.00581
2025	0.535	0.116	0.00581
2026	0.535	0.116	0.00581
2027	0.535	0.116	0.00581
2028	0.535	0.116	0.00581
2029	0.535	0.116	0.00581
2030	**0.535**	**0.116**	**0.00581**

EMFAC2007 Default Fleet Data for Heavy HD Diesel Trucks

South Coast Air Basin	Year 2011 Fleet			
Vehicle Age (Years)	Vehicle Population	Annual Mileage	Accumulated Mileage per Vehicle	Accumulated Mileage, All Vehicles
Age01	2,384	93,214	93,214	222,221,450
Age02	2,236	98,350	191,563	428,320,692
Age03	2,052	99,860	291,423	598,127,056
Age04	1,934	98,620	390,043	754,535,453
Age05	1,828	95,369	485,412	887,128,349
Age06	1,850	90,721	576,132	1,065,823,922
Age07	1,710	85,186	661,318	1,130,616,133
Age08	1,240	79,170	740,488	917,840,059
Age09	1,488	72,994	813,482	1,210,496,568
Age10	1,199	66,904	880,386	1,055,311,955
Age11	1,828	61,077	941,463	1,721,038,128
Age12	2,483	55,635	997,098	2,475,431,390
Age13	2,381	50,651	1,047,749	2,494,361,828
Age14	1,864	46,159	1,093,908	2,039,523,644
Age15	1,767	42,162	1,136,070	2,007,885,132
Age16	1,872	38,637	1,174,706	2,198,769,345
Age17	1,990	35,541	1,210,248	2,408,736,235
Age18	1,516	32,821	1,243,069	1,884,379,106
Age19	1,129	30,417	1,273,486	1,437,995,630
Age20	764	28,261	1,301,747	994,033,084
Total	35,514			27,932,575,161
Average Milage				**786,518**

Emission Factors for LNG Trucks

2011 Model Year Trucks			
Year	**HC (g/mile)**	**PM10 (g/mile)**	**DPM (g/mile)**
2011	0.247	0.044	0.00222
2012	0.287	0.054	0.00271
2013	0.327	0.064	0.00321
2014	0.366	0.074	0.00370
2015	**0.404**	**0.084**	**0.00418**
2016	0.440	0.093	0.00463
2017	0.475	0.101	0.00506
2018	0.506	0.109	0.00545
2019	0.525	0.114	0.00568
2020	0.525	0.114	0.00568
2021	0.525	0.114	0.00568
2022	0.525	0.114	0.00568
2023	0.525	0.114	0.00568
2024	0.525	0.114	0.00568
2025	0.525	0.114	0.00568
2026	0.525	0.114	0.00568
2027	0.525	0.114	0.00568
2028	0.525	0.114	0.00568
2029	0.525	0.114	0.00568
2030	0.525	0.114	0.00568

EMFAC2007 Default Fleet Data for Heavy HD Diesel Trucks

South Coast Air Basin	Year 2012 Fleet			
Vehicle Age (Years)	Vehicle Population	Annual Mileage	Accumulated Mileage per Vehicle	Accumulated Mileage, All Vehicles
Age01	2,622	93,214	93,214	244,443,642
Age02	2,449	98,350	191,563	469,119,780
Age03	2,242	99,860	291,423	653,321,116
Age04	2,108	98,620	390,043	822,372,902
Age05	1,987	95,369	485,412	964,602,452
Age06	1,877	90,721	576,132	1,081,575,954
Age07	1,900	85,186	661,318	1,256,304,296
Age08	1,756	79,170	740,488	1,300,300,630
Age09	1,265	72,994	813,482	1,029,085,145
Age10	1,513	66,904	880,386	1,331,828,070
Age11	1,222	61,077	941,463	1,150,199,774
Age12	1,802	55,635	997,098	1,797,114,595
Age13	2,440	50,651	1,047,749	2,555,990,410
Age14	2,304	46,159	1,093,908	2,520,665,951
Age15	1,774	42,162	1,136,070	2,015,393,417
Age16	1,648	38,637	1,174,706	1,936,105,028
Age17	1,782	35,541	1,210,248	2,156,185,418
Age18	1,869	32,821	1,243,069	2,323,741,755
Age19	1,402	30,417	1,273,486	1,785,202,538
Total	35,962			27,393,552,871
Average Milage				**761,728**

Emission Factors for LNG Trucks

2012 Model Year Trucks			
Year	**HC (g/mile)**	**PM10 (g/mile)**	**DPM (g/mile)**
2012	0.247	0.044	0.00222
2013	0.287	0.054	0.00271
2014	0.327	0.064	0.00321
2015	**0.366**	**0.074**	**0.00370**
2016	0.404	0.084	0.00418
2017	0.440	0.093	0.00463
2018	0.475	0.101	0.00506
2019	0.506	0.109	0.00545
2020	0.515	0.111	0.00556
2021	0.515	0.111	0.00556
2022	0.515	0.111	0.00556
2023	0.515	0.111	0.00556
2024	0.515	0.111	0.00556
2025	0.515	0.111	0.00556
2026	0.515	0.111	0.00556
2027	0.515	0.111	0.00556
2028	0.515	0.111	0.00556
2029	0.515	0.111	0.00556
2030	**0.515**	**0.111**	**0.00556**

Draft LNG Ports Truck Emission Factors for MY 2008 +
Revised March 5 2008

		2015 Emission Factors		
Model Year	**% of Phase-in**	**HC (g/mile)**	**PM10 (g/mile)**	**DPM (g/mile)**
2008	0.25	0.85	0.1090	0.0055
2009	0.25	0.79	0.1011	0.0051
2010	0.25	0.44	0.0926	0.0046
2011	0.25	0.40	0.0835	0.0042
2012	0	0.366	0.0740	0.0037
Fleet Average		**0.6215**	**0.09658**	**0.00483**

		2030 Emission Factors		
Model Year	**% of Phase-in**	**HC (g/mile)**	**PM10 (g/mile)**	**DPM (g/mile)**
2008	0.25	0.94	0.12	0.01
2009	0.25	0.93	0.12	0.01
2010	0.25	0.54	0.12	0.01
2011	0.25	0.52	0.11	0.01
2012	0	0.51	0.51	0.51
Fleet Average		**0.5147**	**0.1173**	**0.0059**

9/27/2002

CALIFORNIA EMISSION INVENTORY AND REPORTING SYSTEM (CEIDARS)
-- Particulate Matter (PM) Speciation Profiles --
(Weight Percent of Chemical Species in Total Particulate Matter)

I. ORIGINAL FORMAT PROFILES:
(all species included in total 100%)

PM PROFILE ID	CHEMICAL NAME	SPECIES	CAS	SAROAD	WEIGHT % of PM TOTAL	WEIGHT % of PM 10	WEIGHT % of PM 2.5	PM PROFILE NAME
425	ALUMINUM	AL	7429905	12101	0.0312	0.0176	0	DIESEL VEHICLE EXHAUST
425	**AMMONIUM ION**	**NH4**	**14798039**	**12301**	**0.3297**	**0.3369**	**0.3322**	**DIESEL VEHICLE EXHAUST**
425	ANTIMONY	SB	7440360	12102	0.0139	0.0036	0.0151	DIESEL VEHICLE EXHAUST
425	**ARSENIC**	**AS**	**7440382**	**12103**	**0.0004**	**0.0005**	**0.0013**	**DIESEL VEHICLE EXHAUST**
425	BARIUM	BA	7440393	12107	0.0518	0.0251	0.0394	DIESEL VEHICLE EXHAUST
425	**BROMINE**	**BR**	**7726956**	**12109**	**0.0011**	**0.0018**	**0.0005**	**DIESEL VEHICLE EXHAUST**
425	**CADMIUM**	**CD**	**7440439**	**12110**	**0.0067**	**0.004**	**0.0069**	**DIESEL VEHICLE EXHAUST**
425	CALCIUM	CA	7440702	12111	0.0884	0.0548	0.0318	DIESEL VEHICLE EXHAUST
425	ELEM CARBON	C(E)	7440440	12116	25.7133	26.1005	26.4363	DIESEL VEHICLE EXHAUST
425	ORGANIC CARBO	C(ORG)		11102	68.7109	68.8796	69.3523	DIESEL VEHICLE EXHAUST
425	CARBONATE ION	R2CO3		12501	0.0592	0.0119	0.0963	DIESEL VEHICLE EXHAUST
425	CHLORINE	**CL**	**7782505**	**12115**	**0.0274**	**0.0344**	**0.0519**	**DIESEL VEHICLE EXHAUST**
425	CHROMIUM	**CR**	**7440473**	**12112**	**0.001**	**0.0012**	**0**	**DIESEL VEHICLE EXHAUST**
425	COBALT	CO	7440484	12113	0.0006	0.0011	0.0008	DIESEL VEHICLE EXHAUST
425	**COPPER**	**CU**	**7440508**	**12114**	**0.003**	**0.0025**	**0.0012**	**DIESEL VEHICLE EXHAUST**
425	GALLIUM	GA	7440553	12124	0	0.0008	0	DIESEL VEHICLE EXHAUST
425	INDIUM	IN	7440746	12131	0.0051	0.0057	0.0123	DIESEL VEHICLE EXHAUST
425	IRON	FE	7439896	12126	0.1018	0.0525	0.0132	DIESEL VEHICLE EXHAUST
425	LANTHANUM	LA	7439910	12146	0.0436	0.0181	0.0595	DIESEL VEHICLE EXHAUST
425	**LEAD**	**PB**	**7439921**	**12128**	**0.003**	**0.0042**	**0.0007**	**DIESEL VEHICLE EXHAUST**
425	**MANGANESE**	**MN**	**7439965**	**12132**	**0.0023**	**0.004**	**0.0017**	**DIESEL VEHICLE EXHAUST**
425	**MERCURY**	**HG**	**7439976**	**12142**	**0.0026**	**0.003**	**0.0015**	**DIESEL VEHICLE EXHAUST**
425	MOLYBDENUM	MO	7439987	12134	0	0.0006	0	DIESEL VEHICLE EXHAUST
425	**NICKEL**	**NI**	**7440020**	**12136**	**0.0016**	**0.0019**	**0.0004**	**DIESEL VEHICLE EXHAUST**
425	NITRATES	NO3	14797558	12306	0.0357	0.0291	0.0278	DIESEL VEHICLE EXHAUST
425	PALLADIUM	PD	7440053	12151	0.0003	0.0016	0.003	DIESEL VEHICLE EXHAUST
425	PHOSPHOROUS	P	7723140	12152	0.0123	0.0127	0.0056	DIESEL VEHICLE EXHAUST
425	POTASSIUM	K	7440097	12180	0.0259	0.0154	0.0034	DIESEL VEHICLE EXHAUST
425	RUBIDIUM	RB	7440177	12176	0.0008	0.0007	0.0005	DIESEL VEHICLE EXHAUST
425	SELENIUM	**SE**	**7782492**	**12154**	**0.0005**	**0.001**	**0.0002**	**DIESEL VEHICLE EXHAUST**
425	SILICON	SI	7440213	12165	0.2869	0.2488	0.1427	DIESEL VEHICLE EXHAUST
425	SILVER	AG	7440224	12166	0.0015	0.0028	0.0073	DIESEL VEHICLE EXHAUST
425	SODIUM	NA	7440235	12184	0.0298	0.0224	0.0343	DIESEL VEHICLE EXHAUST
425	STRONTIUM	SR	7440246	12168	0.0014	0.0014	0.0005	DIESEL VEHICLE EXHAUST
425	**SULFUR**	**S**	**7704349**	**12169**	**1.2727**	**1.3269**	**1.2517**	**DIESEL VEHICLE EXHAUST**
425	TIN	SN	7440315	12160	0.0049	0.008	0.011	DIESEL VEHICLE EXHAUST
425	TITANIUM	TI	7440326	12161	0.0107	0.0054	0.0028	DIESEL VEHICLE EXHAUST
425	**VANADIUM**	**V**	**7440622**	**12164**	**0.0015**	**0.0029**	**0.0022**	**DIESEL VEHICLE EXHAUST**
425	YTTRIUM	Y	7440655	12183	0.0003	0.0012	0.0006	DIESEL VEHICLE EXHAUST
425	ZINC	**ZN**	**7440666**	**12167**	**0.04**	**0.0438**	**0.0278**	**DIESEL VEHICLE EXHAUST**
425	ZIRCONIUM	ZR	7440677	12185	0.0011	0.0008	0.0025	DIESEL VEHICLE EXHAUST
425	UNKNOWN	UNK		12000	3.0764	2.71	2.0217	DIESEL VEHICLE EXHAUST

** Hexavalent Chromium is assumed to be 5 percent of total chromium, in accordance with the CARB AB2588 Technical Support Document (1989), page 57.

Appendix A
Diesel Exhaust
CARB Speciation Profile

ORGANIC PROFILE ID	CHEMICAL NAME	CAS	ORGANIC FRACTION	ORGANIC PROFILE NAME
818	methane	74828	0.04084	Farm equipment - diesel - light & heavy
818	ethane	74840	0.00565	Farm equipment - diesel - light & heavy
818	ethylene	74851	0.14377	Farm equipment - diesel - light & heavy
818	propane	74986	0.00185	Farm equipment - diesel - light & heavy
818	**propylene**	**115071**	**0.02596998**	**Farm equipment - diesel - light & heavy**
818	acetylene	74862	0.04254	Farm equipment - diesel - light & heavy
818	1,2-propadiene	463490	0.00466	Farm equipment - diesel - light & heavy
818	n-butane	106978	0.00104	Farm equipment - diesel - light & heavy
818	1-butene	106989	0.00666	Farm equipment - diesel - light & heavy
818	isobutane	75285	0.01221998	Farm equipment - diesel - light & heavy
818	isobutylene	115117	0.00922	Farm equipment - diesel - light & heavy
818	trans-2-butene	624646	0.00195	Farm equipment - diesel - light & heavy
818	cis-2-butene	590181	0.00094	Farm equipment - diesel - light & heavy
818	1,3-butadiene	106990	0.0019	Farm equipment - diesel - light & heavy
818	n-pentane	109660	0.00175	Farm equipment - diesel - light & heavy
818	1-pentene	109671	0.00324	Farm equipment - diesel - light & heavy
818	trans-2-pentene	646048	0.0004	Farm equipment - diesel - light & heavy
818	cis-2-pentene	627203	0.0003	Farm equipment - diesel - light & heavy
818	2-methylpentane	107835	0.00392	Farm equipment - diesel - light & heavy
818	3-methylpentane	96140	0.00115	Farm equipment - diesel - light & heavy
818	**n-hexane**	**110543**	**0.00157**	**Farm equipment - diesel - light & heavy**
818	n-heptane	142825	0.00068	Farm equipment - diesel - light & heavy
818	n-octane	111659	0.0014	Farm equipment - diesel - light & heavy
818	2,3-dimethyl-1-butene	563780	0.00028	Farm equipment - diesel - light & heavy
818	n-nonane	111842	0.0023	Farm equipment - diesel - light & heavy
818	n-decane	124185	0.00529	Farm equipment - diesel - light & heavy
818	n-undecane	1120214	0.00261	Farm equipment - diesel - light & heavy
818	cyclopentane	287923	0.00012	Farm equipment - diesel - light & heavy
818	cyclohexane	110827	0.00026	Farm equipment - diesel - light & heavy
818	methylcyclohexane	108872	0.00068	Farm equipment - diesel - light & heavy
818	methylcyclopentane	96377	0.00149	Farm equipment - diesel - light & heavy
818	cyclohexanone	108941	0.00107	Farm equipment - diesel - light & heavy
818	2,4-dimethylpentane	108087	0.00019	Farm equipment - diesel - light & heavy
818	2,3-dimethylpentane	565593	0.00073	Farm equipment - diesel - light & heavy
818	2-methylhexane	591764	0.00115	Farm equipment - diesel - light & heavy
818	2,2,4-trimethylpentane	540841	0.00298	Farm equipment - diesel - light & heavy
818	2,4-dimethylhexane	589435	0.00036	Farm equipment - diesel - light & heavy
818	2,3,4-trimethylpentane	565753	0.00015	Farm equipment - diesel - light & heavy
818	2,2-dimethylbutane	75832	0.00061	Farm equipment - diesel - light & heavy
818	3-methylhexane	589344	0.00348	Farm equipment - diesel - light & heavy
818	**methyl alcohol**	**67561**	**0.0003**	**Farm equipment - diesel - light & heavy**
818	ethanol	64175	0.00009	Farm equipment - diesel - light & heavy
818	**formaldehyde**	**50000**	**0.14714**	**Farm equipment - diesel - light & heavy**
818	**acetaldehyde**	**75070**	**0.07353**	**Farm equipment - diesel - light & heavy**
818	propionaldehyde	123386	0.0097	Farm equipment - diesel - light & heavy
818	butyraldehyde	123728	0.01867998	Farm equipment - diesel - light & heavy
818	c5 aldehyde		0.0011	Farm equipment - diesel - light & heavy
818	acetone	67641	0.07507	Farm equipment - diesel - light & heavy
818	**methyl ethyl ketone (r**	**78933**	**0.01476998**	**Farm equipment - diesel - light & heavy**
818	methyl n-butyl ketone	591786	0.00899	Farm equipment - diesel - light & heavy
818	isomers of butylbenzen		0.00127	Farm equipment - diesel - light & heavy
818	isomers of diethylbenze		0.00135	Farm equipment - diesel - light & heavy
818	**benzene**	**71432**	**0.02000998**	**Farm equipment - diesel - light & heavy**
818	**toluene**	**108883**	**0.01473**	**Farm equipment - diesel - light & heavy**
818	**ethylbenzene**	**100414**	**0.00305**	**Farm equipment - diesel - light & heavy**
818	**o-xylene**	**95476**	**0.00335**	**Farm equipment - diesel - light & heavy**
818	**m-xylene**	**108383**	**0.00611**	**Farm equipment - diesel - light & heavy**
818	**p-xylene**	**106423**	**0.00095**	**Farm equipment - diesel - light & heavy**
818	1,3,5-trimethylbenzene	108678	0.00194	Farm equipment - diesel - light & heavy
818	1,2,4-trimethylbenzene	95636	0.0053	Farm equipment - diesel - light & heavy
818	n-propylbenzene	103651	0.00122	Farm equipment - diesel - light & heavy
818	t-butylbenzene	98066	0.00006	Farm equipment - diesel - light & heavy
818	**styrene**	**100425**	**0.00058**	**Farm equipment - diesel - light & heavy**
818	1,2,3-trimethylbenzene	526738	0.0012	Farm equipment - diesel - light & heavy
818	(1-methylpropyl)benzer	135988	0.00051	Farm equipment - diesel - light & heavy
818	(2-methylpropyl)benzer	538932	0.00126	Farm equipment - diesel - light & heavy
818	benzaldehyde	100527	0.00699	Farm equipment - diesel - light & heavy
818	ethylhexane		0.00061	Farm equipment - diesel - light & heavy
818	b-methylstyrene	637503	0.00047	Farm equipment - diesel - light & heavy
818	isopropylbenzene (cum	98828	0.00015	Farm equipment - diesel - light & heavy
818	indan	496117	0.00188	Farm equipment - diesel - light & heavy
818	naphthalene	91203	0.00085	Farm equipment - diesel - light & heavy
818	c9 aromatics		0.00497	Farm equipment - diesel - light & heavy
818	c10 aromatics		0.00079	Farm equipment - diesel - light & heavy
818	alkene ketone		0.01749	Farm equipment - diesel - light & heavy
818	c6 aldehydes		0.03799	Farm equipment - diesel - light & heavy
818	isopentane	78784	0.00602	Farm equipment - diesel - light & heavy
818	2,3-dimethylhexane	584941	0.00011	Farm equipment - diesel - light & heavy
818	2-methylheptane	592278	0.00057	Farm equipment - diesel - light & heavy
818	1,2-diethylbenzene (ort	135013	0.00086	Farm equipment - diesel - light & heavy
818	3,3-dimethyl-1-butene	558372	0.0282	Farm equipment - diesel - light & heavy
818	1-methyl-3-ethylbenzer	620144	0.00247	Farm equipment - diesel - light & heavy
818	1-methyl-2-ethylbenzer	611143	0.00138	Farm equipment - diesel - light & heavy
818	unidentified		0.13862	Farm equipment - diesel - light & heavy

9/27/2002

CALIFORNIA EMISSION INVENTORY AND REPORTING SYSTEM (CEIDARS)
-- Particulate Matter (PM) Speciation Profiles --
(Weight Percent of Chemical Species in Total Particulate Matter)

I. ORIGINAL FORMAT PROFILES:
(all species included in total 100%)

PM PROFILE ID	CHEMICAL NAME	SPECIE	CAS	SAROAD	WEIGHT % of PM TOTAL	WEIGHT % of PM 10	WEIGHT % of PM 2.5	PM PROFILE NAME
123	**BROMINE**	**BR**	**7726956**	**12109**	**0.05**	**0.05**	**0.05**	**STAT. I.C.ENGINE-GAS**
123	CALCIUM	CA	7440702	12111	0.55	0.55	0.55	STAT. I.C.ENGINE-GAS
123	**CHLORINE**	**CL**	**7782505**	**12115**	**7**	**7**	**7**	**STAT. I.C.ENGINE-GAS**
123	**CHROMIUM**	**CR**	**7440473**	**12112**	**0.05**	**0.05**	**0.05**	**STAT. I.C.ENGINE-GAS**
123	COBALT	CO	7440484	12113	0.05	0.05	0.05	STAT. I.C.ENGINE-GAS
123	**COPPER**	**CU**	**7440508**	**12114**	**0.05**	**0.05**	**0.05**	**STAT. I.C.ENGINE-GAS**
123	ELEM CARBON	C(E)	7440440	12116	20	20	20	STAT. I.C.ENGINE-GAS
123	IRON	FE	7439896	12126	0.05	0.05	0.05	STAT. I.C.ENGINE-GAS
123	**MANGANESE**	**MN**	**7439965**	**12132**	**0.05**	**0.05**	**0.05**	**STAT. I.C.ENGINE-GAS**
123	**NICKEL**	**NI**	**7440020**	**12136**	**0.05**	**0.05**	**0.05**	**STAT. I.C.ENGINE-GAS**
123	NITRATES	NO3	14797558	12306	0.55	0.55	0.55	STAT. I.C.ENGINE-GAS
123	POTASSIUM	K	7440097	12180	0.55	0.55	0.55	STAT. I.C.ENGINE-GAS
123	**SULFATES**	**SO4**	**14808798**	**12403**	**45**	**45**	**45**	**STAT. I.C.ENGINE-GAS**
123	**ZINC**	**ZN**	**7440666**	**12167**	**0.05**	**0.05**	**0.05**	**STAT. I.C.ENGINE-GAS**
123	OTHER	OTHER	99999	12999	25.95	25.95	25.95	STAT. I.C.ENGINE-GAS

** Hexavalent chromium is assumed to be 5 percent of total chromium, in accordance with CARB AB2588 Technical Support Document (1989), page 57.

Appendix A
LNG Exhaust
CARB Speciation Profile

ORGANIC PROFILE ID	CHEMICAL NAME	CAS	ORGANIC FRACTION	ORGANIC PROFILE NAME
719	isomers of hexane		0.0002	ICE-reciprocating-natural gas
719	isomers of heptane		0.0004	ICE-reciprocating-natural gas
719	isomers of octane		0.0002	ICE-reciprocating-natural gas
719	isomers of nonane		0.0001	ICE-reciprocating-natural gas
719	isomers of decane		0.0002	ICE-reciprocating-natural gas
719	isomers of butene		0.0026	ICE-reciprocating-natural gas
719	isomers of pentane		0.0013	ICE-reciprocating-natural gas
719	methane	74828	0.76639984	ICE-reciprocating-natural gas
719	ethane	74840	0.1399	ICE-reciprocating-natural gas
719	ethylene	74851	0.0063	ICE-reciprocating-natural gas
719	propane	74986	0.0291	ICE-reciprocating-natural gas
719	**propylene**	**115071**	**0.0169**	**ICE-reciprocating-natural gas**
719	acetylene	74862	0.0032	ICE-reciprocating-natural gas
719	n-butane	106978	0.01	ICE-reciprocating-natural gas
719	1-butene	106989	0.0001	ICE-reciprocating-natural gas
719	isobutane	75285	0.0043	ICE-reciprocating-natural gas
719	isobutylene	115117	0.0002	ICE-reciprocating-natural gas
719	trans-2-butene	624646	0.0013	ICE-reciprocating-natural gas
719	cis-2-butene	590181	0.0002	ICE-reciprocating-natural gas
719	n-pentane	109660	0.0013	ICE-reciprocating-natural gas
719	1-pentene	109671	0.0001	ICE-reciprocating-natural gas
719	trans-2-pentene	646048	0.0001	ICE-reciprocating-natural gas
719	2-methyl-2-butene	513359	0.0001	ICE-reciprocating-natural gas
719	3-methylpentane	96140	0.0002	ICE-reciprocating-natural gas
719	**n-hexane**	**110543**	**0.0002**	**ICE-reciprocating-natural gas**
719	n-heptane	142825	0.0002	ICE-reciprocating-natural gas
719	n-octane	111659	0.0002	ICE-reciprocating-natural gas
719	n-nonane	111842	0.0001	ICE-reciprocating-natural gas
719	n-decane	124185	0.0001	ICE-reciprocating-natural gas
719	cyclopentane	287923	0.0002	ICE-reciprocating-natural gas
719	cyclohexane	110827	0.0001	ICE-reciprocating-natural gas
719	methylcyclohexane	108872	0.0002	ICE-reciprocating-natural gas
719	methylcyclopentane	96377	0.0004	ICE-reciprocating-natural gas
719	1-octene	111660	0.0001	ICE-reciprocating-natural gas
719	1-nonene	124118	0.0001	ICE-reciprocating-natural gas
719	2,4-dimethylpentane	108087	0.0001	ICE-reciprocating-natural gas
719	2,2-dimethylbutane	75832	0.0001	ICE-reciprocating-natural gas
719	3-methylhexane	589344	0.0001	ICE-reciprocating-natural gas
719	3-methylheptane	589811	0.0002	ICE-reciprocating-natural gas
719	**formaldehyde**	**50000**	**0.0081**	**ICE-reciprocating-natural gas**
719	**acetaldehyde**	**75070**	**0.0003**	**ICE-reciprocating-natural gas**
719	butyraldehyde	123728	0.0002	ICE-reciprocating-natural gas
719	**isomers of xylene**	**1330207**	**0.0002**	**ICE-reciprocating-natural gas**
719	**benzene**	**71432**	**0.0011**	**ICE-reciprocating-natural gas**
719	**toluene**	**108883**	**0.0004**	**ICE-reciprocating-natural gas**
719	**ethylbenzene**	**100414**	**0.0001**	**ICE-reciprocating-natural gas**
719	**o-xylene**	**95476**	**0.0001**	**ICE-reciprocating-natural gas**
719	**m-xylene**	**108383**	**0.0001**	**ICE-reciprocating-natural gas**
719	1,3,5-trimethylbenzene	108678	0.0002	ICE-reciprocating-natural gas
719	1,2,4-trimethylbenzene	95636	0.0001	ICE-reciprocating-natural gas
719	1,2,3-trimethylbenzene	526738	0.0001	ICE-reciprocating-natural gas
719	c10 dialkyl benzenes		0.0001	ICE-reciprocating-natural gas
719	1-heptene	592767	0.0001	ICE-reciprocating-natural gas
719	c10 internal alkenes		0.0002	ICE-reciprocating-natural gas
719	2-methyl-1-pentene	763291	0.0002	ICE-reciprocating-natural gas
719	c9 internal alkenes		0.0004	ICE-reciprocating-natural gas
719	c9 aromatics		0.0001	ICE-reciprocating-natural gas
719	1-methyl-3-ethylbenzene	620144	0.0001	ICE-reciprocating-natural gas
719	1-methyl-2-ethylbenzene	611143	0.0001	ICE-reciprocating-natural gas

Appendix A
Gasoline Exhaust

TOG Speciation Profile

Gasoline - TOG Speciation TOG/Toxic Fractions*/Hot Stabilized Exhaust					
Year	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
	71432	50000	106990	75070	107028
2015	0.024349	0.017100	0.005530	0.003850	0.001310
2030	0.021079	0.013600	0.004659	0.002450	0.001130

Taken from: ***Project-Level Mobile Source Air Toxics Analysis Spreadsheet Tool***
Version 1.2, UC Davis - Caltrans Air Quality Project, 11/13/2006.

APPENDIX B

Emission Calculations

Table B-1
2015 No Build
Annual Average Truck Emissions

	Length	Average Speed	Port AADT Trucks	SCAG AADT Trucks	Port LNG Trucks	Port DSL Trucks	SCAG Gasoline Trucks	SCAG Diesel Trucks
Baseline 2015	mile	mph	veh/day	veh/day	veh/day	veh/day	veh/day	veh/day
SR-47 Mainline, New Dock Ramps to HF Ramps	0.75	40	15109	50	6044	9065	26	24
Henry Ford Ramps	0.15	25	7944	1	3178	4766	1	0
Henry Ford n/o Ramps to Alameda	0.68	25	8952	1	3581	5371	1	0
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	0.95	40	7167	49	2867	4300	26	23
SR-103 Anaheim to PCH	0.57	40	8133	75	3253	4880	39	36
SR-103 PCH to Sepulveda/Willow	1.02	40	4548	103	1819	2729	54	49
E and W Harry Bridges, Figueroa to start Alameda	1.44	35	4954	139	1982	2972	73	66
Alameda beginning (E Harry Bridges) to Anaheim	0.77	35	5712	595	2285	3427	311	284
Alameda Anaheim to Henry Ford	0.42	35	3687	548	1475	2212	287	261
Alameda Henry Ford to PCH	0.34	35	11552	549	4621	6931	287	262
Alameda PCH to 405	2.27	45	11418	1774	4567	6851	928	846
Alameda 405 to del Amo	1.72	45	5982	1440	2393	3589	753	687
Alameda, del Amo to South Santa Fe Avenue	0.84	45	3567	878	1427	2140	459	419
Alameda, South Santa Fe Avenue to SR-91	1.15	45	3372	751	1349	2023	393	358
I-110, "C" Street Interchange to Anaheim	0.49	65	14899	2787	5960	8939	1458	1329
I-110, Anaheim to PCH	0.80	65	15219	3182	6088	9131	1664	1518
1-110, PCH to Sepulveda	1.39	65	15704	4661	6282	9422	2438	2223
I-110, Sepulveda to Carson	1.56	65	14617	6337	5847	8770	3314	3023
I-110, Carson to Del Amo	1.02	65	14112	7265	5645	8467	3800	3465
I-110, Del Amo to 405	0.74	65	11480	7298	4592	6888	3817	3481
I-110, 405 to SR-91	1.09	65	10629	11410	4252	6377	5967	5443
I-710, Anaheim to PCH	0.50	65	44444	3790	17778	26666	1982	1808
I-710, PCH to Willow	1.01	65	46513	4360	18605	27908	2280	2080
I-710, Willow to 405	1.52	65	46281	4411	18512	27769	2307	2104
I-710, 405 to Del Amo	1.42	65	43224	6699	17290	25934	3504	3195
I-710, Del Amo to Long Beach Blvd Interchange	1.17	65	42268	7372	16907	25361	3856	3516
I-710, Long Beach Boulevard to SR-91	0.96	65	41703	7598	16681	25022	3974	3624
PCH, I110 to Alameda	2.38	50	1917	1275	767	1150	667	608
PCH, Alameda to SR-103	0.94	50	938	394	375	563	206	188
PCH, SR-103 to I-710	0.98	50	5678	753	2271	3407	394	359
Sepulveda, I-110 to Avalon	1.37	40	339	608	136	203	318	290
Sepulveda, Avalon to Alameda	1.70	40	196	451	78	118	236	215
Sepulveda, Alameda to ICTF	0.67	40	1896	312	758	1138	163	149
Sepulveda, ICTF to SR-103	0.17	40	4548	245	1819	2729	128	117
Del Amo, I-110 to Wilmington	2.96	40	129	471	52	77	246	225
Del Amo, Wilmington to Alameda	0.77	40	1515	1713	606	909	896	817
Del Amo, Alameda to I-710	0.87	40	1042	1340	417	625	701	639
223rd Street, I-110 to Avalon	1.36	45	64	551	26	38	288	263
223rd Street, Avalon to Wilmington	1.23	45	59	510	24	35	267	243
223rd Street, Wilmington to Alameda	0.79	45	619	789	248	371	413	376
W Wardlow from Alameda to I-710	1.30	45	166	353	66	100	185	168

Table B-1
2015 No Build
Annual Average Truck Emissions

	Port	Port	Port	Port	SCAG		Port	Port	Port	SCAG	
	LNG TOG	LNG PM10	LNG DPM	Dsl Exhst PM	Gasoline TOG	Dsl Exhst PM	LNG TOG	LNG PM10	LNG+DSL DPM	Gasoline TOG	Dsl Exhst PM
Baseline 2015	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to HF Ramps	0.590	0.092	0.00483	0.063	0.213	0.119	2,141	333	360	3	2
Henry Ford Ramps	0.590	0.092	0.00483	0.054	0.403	0.122	229	36	33	0	0
Henry Ford n/o Ramps to Alameda	0.590	0.092	0.00483	0.054	0.403	0.122	1,165	181	169	0	0
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	0.590	0.092	0.00483	0.063	0.213	0.119	1,291	201	217	4	2
SR-103 Anaheim to PCH	0.590	0.092	0.00483	0.063	0.213	0.119	886	138	149	4	2
SR-103 PCH to Sepulveda/Willow	0.590	0.092	0.00483	0.063	0.213	0.119	880	137	148	9	5
E and W Harry Bridges, Figueroa to start Alameda	0.590	0.092	0.00483	0.058	0.252	0.115	1,359	211	210	21	9
Alameda beginning (E Harry Bridges) to Anaheim	0.590	0.092	0.00483	0.058	0.252	0.115	836	130	129	49	20
Alameda Anaheim to Henry Ford	0.590	0.092	0.00483	0.058	0.252	0.115	296	46	46	25	10
Alameda Henry Ford to PCH	0.590	0.092	0.00483	0.058	0.252	0.115	754	117	117	20	8
Alameda PCH to 405	0.590	0.092	0.00483	0.070	0.186	0.126	4,919	764	917	315	195
Alameda 405 to del Amo	0.590	0.092	0.00483	0.070	0.186	0.126	1,957	304	365	194	120
Alameda, del Amo to South Santa Fe Avenue	0.590	0.092	0.00483	0.070	0.186	0.126	570	89	106	58	36
Alameda, South Santa Fe Avenue to SR-91	0.590	0.092	0.00483	0.070	0.186	0.126	739	115	138	68	42
I-110, "C" Street Interchange to Anaheim	0.590	0.092	0.00483	0.122	0.166	0.194	1,393	216	444	96	102
I-110, Anaheim to PCH	0.590	0.092	0.00483	0.122	0.166	0.194	2,323	361	741	179	190
1-110, PCH to Sepulveda	0.590	0.092	0.00483	0.122	0.166	0.194	4,137	643	1,320	451	481
I-110, Sepulveda to Carson	0.590	0.092	0.00483	0.122	0.166	0.194	4,326	672	1,381	689	735
I-110, Carson to Del Amo	0.590	0.092	0.00483	0.122	0.166	0.194	2,740	426	874	519	553
I-110, Del Amo to 405	0.590	0.092	0.00483	0.122	0.166	0.194	1,617	251	516	378	403
I-110, 405 to SR-91	0.590	0.092	0.00483	0.122	0.166	0.194	2,208	343	705	871	928
I-710, Anaheim to PCH	0.590	0.092	0.00483	0.122	0.166	0.194	4,219	656	1,346	132	141
I-710, PCH to Willow	0.590	0.092	0.00483	0.122	0.166	0.194	8,887	1,381	2,836	306	326
I-710, Willow to 405	0.590	0.092	0.00483	0.122	0.166	0.194	13,397	2,082	4,276	469	500
I-710, 405 to Del Amo	0.590	0.092	0.00483	0.122	0.166	0.194	11,661	1,812	3,721	664	708
I-710, Del Amo to Long Beach Blvd Interchange	0.590	0.092	0.00483	0.122	0.166	0.194	9,431	1,466	3,010	605	644
I-710, Long Beach Boulevard to SR-91	0.590	0.092	0.00483	0.122	0.166	0.194	7,616	1,184	2,431	510	544
PCH, I110 to Alameda	0.590	0.092	0.00483	0.080	0.170	0.138	867	135	183	218	160
PCH, Alameda to SR-103	0.590	0.092	0.00483	0.080	0.170	0.138	168	26	36	27	20
PCH, SR-103 to I-710	0.590	0.092	0.00483	0.080	0.170	0.138	1,059	165	224	53	39
Sepulveda, I-110 to Avalon	0.590	0.092	0.00483	0.063	0.213	0.119	88	14	15	75	38
Sepulveda, Avalon to Alameda	0.590	0.092	0.00483	0.063	0.213	0.119	63	10	11	69	35
Sepulveda, Alameda to ICTF	0.590	0.092	0.00483	0.063	0.213	0.119	243	38	41	19	10
Sepulveda, ICTF to SR-103	0.590	0.092	0.00483	0.063	0.213	0.119	148	23	25	4	2
Del Amo, I-110 to Wilmington	0.590	0.092	0.00483	0.063	0.213	0.119	73	11	12	125	64
Del Amo, Wilmington to Alameda	0.590	0.092	0.00483	0.063	0.213	0.119	220	34	37	117	60
Del Amo, Alameda to I-710	0.590	0.092	0.00483	0.063	0.213	0.119	173	27	29	105	53
223rd Street, I-110 to Avalon	0.590	0.092	0.00483	0.070	0.186	0.126	17	3	3	59	36
223rd Street, Avalon to Wilmington	0.590	0.092	0.00483	0.070	0.186	0.126	14	2	3	49	30
223rd Street, Wilmington to Alameda	0.590	0.092	0.00483	0.070	0.186	0.126	93	14	17	49	30
W Wardlow from Alameda to I-710	0.590	0.092	0.00483	0.070	0.186	0.126	41	6	8	36	22

Table B-1
2015 No Build
Annual Average Truck Emissions

	Total Average Annual Toxic Emissions from Trucks																	
	DPM	Acet-aldehyde	Acrolein	Benzene	Bromine	1,3-Butadiene	Chlorine	Chromium	Copper	Form-aldehyde	n-Hexane	Manganese	Nickel	Propylene	Sulfates	Toluene	Xylenes	Zinc
	9901	75070	107028	71432	7726956	106990	7782505	18540299	7440508	50000	110543	7439965	7440020	115071	9960	108883	1330207	7440666
Baseline 2015	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to HF Ramps	3.62E+02	6.55E-01	4.37E-03	2.44E+00	1.66E-01	1.85E-02	2.33E+01	8.32E-03	1.66E-01	1.74E+01	4.28E-01	1.66E-01	1.66E-01	3.62E+01	1.50E+02	8.56E-01	4.28E-01	1.66E-01
Henry Ford Ramps	3.33E+01	6.88E-02	3.37E-05	2.52E-01	1.78E-02	1.42E-04	2.49E+00	8.89E-04	1.78E-02	1.85E+00	4.58E-02	1.78E-02	1.78E-02	3.87E+00	1.60E+01	9.16E-02	4.58E-02	1.78E-02
Henry Ford n/o Ramps to Alameda	1.69E+02	3.50E-01	1.52E-04	1.28E+00	9.05E-02	6.43E-04	1.27E+01	4.53E-03	9.05E-02	9.44E+00	2.33E-01	9.05E-02	9.05E-02	1.97E+01	8.15E+01	4.66E-01	2.33E-01	9.05E-02
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	2.19E+02	4.03E-01	5.45E-03	1.52E+00	1.00E-01	2.30E-02	1.40E+01	5.01E-03	1.00E-01	1.05E+01	2.58E-01	1.00E-01	1.00E-01	2.18E+01	9.03E+01	5.16E-01	2.58E-01	1.00E-01
SR-103 Anaheim to PCH	1.51E+02	2.81E-01	5.04E-03	1.07E+00	6.89E-02	2.13E-02	9.64E+00	3.44E-03	6.89E-02	7.25E+00	1.77E-01	6.89E-02	6.89E-02	1.50E+01	6.20E+01	3.55E-01	1.77E-01	6.89E-02
SR-103 PCH to Sepulveda/Willow	1.53E+02	3.00E-01	1.23E-02	1.20E+00	6.84E-02	5.19E-02	9.58E+00	3.42E-03	6.84E-02	7.29E+00	1.76E-01	6.84E-02	6.84E-02	1.49E+01	6.16E+01	3.52E-01	1.76E-01	6.84E-02
E and W Harry Bridges, Figueroa to start Alameda	2.19E+02	4.90E-01	2.79E-02	2.01E+00	1.06E-01	1.18E-01	1.48E+01	5.28E-03	1.06E-01	1.14E+01	2.72E-01	1.06E-01	1.06E-01	2.30E+01	9.50E+01	5.44E-01	2.72E-01	1.06E-01
Alameda beginning (E Harry Bridges) to Anaheim	1.49E+02	4.38E-01	6.36E-02	2.10E+00	6.49E-02	2.68E-01	9.09E+00	3.25E-03	6.49E-02	7.60E+00	1.67E-01	6.49E-02	6.49E-02	1.41E+01	5.84E+01	3.34E-01	1.67E-01	6.49E-02
Alameda Anaheim to Henry Ford	5.59E+01	1.83E-01	3.21E-02	9.22E-01	2.30E-02	1.36E-01	3.22E+00	1.15E-03	2.30E-02	2.81E+00	5.91E-02	2.30E-02	2.30E-02	5.00E+00	2.07E+01	1.18E-01	5.91E-02	2.30E-02
Alameda Henry Ford to PCH	1.25E+02	3.03E-01	2.62E-02	1.32E+00	5.86E-02	1.11E-01	8.21E+00	2.93E-03	5.86E-02	6.45E+00	1.51E-01	5.86E-02	5.86E-02	1.27E+01	5.28E+01	3.02E-01	1.51E-01	5.86E-02
Alameda PCH to 405	1.11E+03	2.69E+00	4.12E-01	1.31E+01	3.82E-01	1.74E+00	5.35E+01	1.91E-02	3.82E-01	4.52E+01	9.84E-01	3.82E-01	3.82E-01	8.31E+01	3.44E+02	1.97E+00	9.84E-01	3.82E-01
Alameda 405 to del Amo	4.85E+02	1.33E+00	2.54E-01	6.88E+00	1.52E-01	1.07E+00	2.13E+01	7.60E-03	1.52E-01	1.92E+01	3.91E-01	1.52E-01	1.52E-01	3.31E+01	1.37E+02	7.83E-01	3.91E-01	1.52E-01
Alameda, del Amo to South Santa Fe Avenue	1.42E+02	3.93E-01	7.57E-02	2.03E+00	4.43E-02	3.20E-01	6.20E+00	2.21E-03	4.43E-02	5.60E+00	1.14E-01	4.43E-02	4.43E-02	9.63E+00	3.99E+01	2.28E-01	1.14E-01	4.43E-02
Alameda, South Santa Fe Avenue to SR-91	1.80E+02	4.83E-01	8.88E-02	2.46E+00	5.74E-02	3.75E-01	8.04E+00	2.87E-03	5.74E-02	7.15E+00	1.48E-01	5.74E-02	5.74E-02	1.25E+01	5.17E+01	2.96E-01	1.48E-01	5.74E-02
I-110, "C" Street Interchange to Anaheim	5.47E+02	7.87E-01	1.25E-01	3.86E+00	1.08E-01	5.30E-01	1.52E+01	5.41E-03	1.08E-01	1.29E+01	2.79E-01	1.08E-01	1.08E-01	2.35E+01	9.74E+01	5.57E-01	2.79E-01	1.08E-01
I-110, Anaheim to PCH	9.32E+02	1.38E+00	2.34E-01	6.90E+00	1.80E-01	9.87E-01	2.53E+01	9.02E-03	1.80E-01	2.19E+01	4.65E-01	1.80E-01	1.80E-01	3.93E+01	1.62E+02	9.29E-01	4.65E-01	1.80E-01
1-110, PCH to Sepulveda	1.80E+03	2.98E+00	5.91E-01	1.55E+01	3.21E-01	2.50E+00	4.50E+01	1.61E-02	3.21E-01	4.12E+01	8.27E-01	3.21E-01	3.21E-01	6.99E+01	2.89E+02	1.65E+00	8.27E-01	3.21E-01
I-110, Sepulveda to Carson	2.12E+03	3.95E+00	9.03E-01	2.15E+01	3.36E-01	3.81E+00	4.71E+01	1.68E-02	3.36E-01	4.68E+01	8.65E-01	3.36E-01	3.36E-01	7.31E+01	3.03E+02	1.73E+00	8.65E-01	3.36E-01
I-110, Carson to Del Amo	1.43E+03	2.82E+00	6.79E-01	1.56E+01	2.13E-01	2.87E+00	2.98E+01	1.06E-02	2.13E-01	3.11E+01	5.48E-01	2.13E-01	2.13E-01	4.63E+01	1.92E+02	1.10E+00	5.48E-01	2.13E-01
I-110, Del Amo to 405	9.19E+02	1.94E+00	4.95E-01	1.10E+01	1.26E-01	2.09E+00	1.76E+01	6.28E-03	1.26E-01	1.96E+01	3.23E-01	1.26E-01	1.26E-01	2.73E+01	1.13E+02	6.47E-01	3.23E-01	1.26E-01
I-110, 405 to SR-91	1.63E+03	4.02E+00	1.14E+00	2.36E+01	1.72E-01	4.82E+00	2.40E+01	8.58E-03	1.72E-01	3.28E+01	4.42E-01	1.72E-01	1.72E-01	3.73E+01	1.54E+02	8.83E-01	4.42E-01	1.72E-01
I-710, Anaheim to PCH	1.49E+03	1.77E+00	1.73E-01	7.86E+00	3.28E-01	7.31E-01	4.59E+01	1.64E-02	3.28E-01	3.64E+01	8.44E-01	3.28E-01	3.28E-01	7.13E+01	2.95E+02	1.69E+00	8.44E-01	3.28E-01
I-710, PCH to Willow	3.16E+03	3.85E+00	4.01E-01	1.72E+01	6.91E-01	1.69E+00	9.67E+01	3.45E-02	6.91E-01	7.72E+01	1.78E+00	6.91E-01	6.91E-01	1.50E+02	6.21E+02	3.55E+00	1.78E+00	6.91E-01
I-710, Willow to 405	4.78E+03	5.83E+00	6.15E-01	2.62E+01	1.04E+00	2.60E+00	1.46E+02	5.20E-02	1.04E+00	1.17E+02	2.68E+00	1.04E+00	1.04E+00	2.26E+02	9.37E+02	5.36E+00	2.68E+00	1.04E+00
I-710, 405 to Del Amo	4.43E+03	6.06E+00	8.70E-01	2.90E+01	9.06E-01	3.67E+00	1.27E+02	4.53E-02	9.06E-01	1.06E+02	2.33E+00	9.06E-01	9.06E-01	1.97E+02	8.15E+02	4.66E+00	2.33E+00	9.06E-01
I-710, Del Amo to Long Beach Blvd Interchange	3.65E+03	5.16E+00	7.92E-01	2.51E+01	7.33E-01	3.34E+00	1.03E+02	3.66E-02	7.33E-01	8.67E+01	1.89E+00	7.33E-01	7.33E-01	1.59E+02	6.60E+02	3.77E+00	1.89E+00	7.33E-01
I-710, Long Beach Boulevard to SR-91	2.97E+03	4.25E+00	6.68E-01	2.08E+01	5.92E-01	2.82E+00	8.28E+01	2.96E-02	5.92E-01	7.04E+01	1.52E+00	5.92E-01	5.92E-01	1.29E+02	5.33E+02	3.05E+00	1.52E+00	5.92E-01
PCH, I110 to Alameda	3.44E+02	1.10E+00	2.85E-01	6.25E+00	6.73E-02	1.20E+00	9.43E+00	3.37E-03	6.73E-02	1.07E+01	1.73E-01	6.73E-02	6.73E-02	1.46E+01	6.06E+01	3.47E-01	1.73E-01	6.73E-02
PCH, Alameda to SR-103	5.51E+01	1.53E-01	3.48E-02	8.32E-01	1.30E-02	1.47E-01	1.83E+00	6.52E-04	1.30E-02	1.81E+00	3.36E-02	1.30E-02	1.30E-02	2.84E+00	1.17E+01	6.71E-02	3.36E-02	1.30E-02
PCH, SR-103 to I-710	2.63E+02	5.22E-01	6.94E-02	2.46E+00	8.23E-02	2.93E-01	1.15E+01	4.12E-03	8.23E-02	9.49E+00	2.12E-01	8.23E-02	8.23E-02	1.79E+01	7.41E+01	4.24E-01	2.12E-01	8.23E-02
Sepulveda, I-110 to Avalon	5.29E+01	3.13E-01	9.76E-02	1.91E+00	6.85E-03	4.12E-01	9.59E-01	3.43E-04	6.85E-03	1.99E+00	1.76E-02	6.85E-03	6.85E-03	1.49E+00	6.17E+00	3.53E-02	1.76E-02	6.85E-03
Sepulveda, Avalon to Alameda	4.56E+01	2.83E-01	8.99E-02	1.74E+00	4.92E-03	3.79E-01	6.88E-01	2.46E-04	4.92E-03	1.69E+00	1.27E-02	4.92E-03	4.92E-03	1.07E+00	4.43E+00	2.53E-02	1.27E-02	4.92E-03
Sepulveda, Alameda to ICTF	5.05E+01	1.45E-01	2.47E-02	7.26E-01	1.89E-02	1.04E-01	2.64E+00	9.44E-04	1.89E-02	2.29E+00	4.86E-02	1.89E-02	1.89E-02	4.11E+00	1.70E+01	9.72E-02	4.86E-02	1.89E-02
Sepulveda, ICTF to SR-103	2.68E+01	5.89E-02	4.92E-03	2.54E-01	1.15E-02	2.08E-02	1.61E+00	5.76E-04	1.15E-02	1.26E+00	2.96E-02	1.15E-02	1.15E-02	2.50E+00	1.04E+01	5.93E-02	2.96E-02	1.15E-02
Del Amo, I-110 to Wilmington	7.58E+01	5.02E-01	1.63E-01	3.12E+00	5.64E-03	6.90E-01	7.89E-01	2.82E-04	5.64E-03	2.72E+00	1.45E-02	5.64E-03	5.64E-03	1.23E+00	5.07E+00	2.90E-02	1.45E-02	5.64E-03
Del Amo, Wilmington to Alameda	9.70E+01	5.18E-01	1.54E-01	3.10E+00	1.71E-02	6.49E-01	2.40E+00	8.56E-04	1.71E-02	3.79E+00	4.41E-02	1.71E-02	1.71E-02	3.73E+00	1.54E+01	8.82E-02	4.41E-02	1.71E-02
Del Amo, Alameda to I-710	8.24E+01	4.55E-01	1.37E-01	2.74E+00	1.34E-02	5.79E-01	1.88E+00	6.71E-04	1.34E-02	3.19E+00	3.45E-02	1.34E-02	1.34E-02	2.92E+00	1.21E+01	6.91E-02	3.45E-02	1.34E-02
223rd Street, I-110 to Avalon	3.95E+01	2.31E-01	7.70E-02	1.45E+00	1.29E-03	3.25E-01	1.80E-01	6.44E-05	1.29E-03	1.14E+00	3.32E-03	1.29E-03	1.29E-03	2.80E-01	1.16E+00	6.63E-03	3.32E-03	1.29E-03
223rd Street, Avalon to Wilmington	3.29E+01	1.93E-01	6.41E-02	1.21E+00	1.07E-03	2.71E-01	1.49E-01	5.34E-05	1.07E-03	9.48E-01	2.75E-03	1.07E-03	1.07E-03	2.32E-01	9.61E-01	5.50E-03	2.75E-03	1.07E-03
223rd Street, Wilmington to Alameda	4.75E+01	2.16E-01	6.39E-02	1.29E+00	7.21E-03	2.70E-01	1.01E+00	3.61E-04	7.21E-03	1.59E+00	1.86E-02	7.21E-03	7.21E-03	1.57E+00	6.49E+00	3.71E-02	1.86E-02	7.21E-03
W Wardlow from Alameda to I-710	2.99E+01	1.51E-01	4.71E-02	9.20E-01	3.19E-03	1.99E-01	4.46E-01	1.59E-04	3.19E-03	9.47E-01	8.20E-03	3.19E-03	3.19E-03	6.93E-01	2.87E+00	1.64E-02	8.20E-03	3.19E-03

Table B-1
2015 No Build
Annual Average Truck Emissions

	Port - LNG Emissions									Port - LNG Emissions								
	TOG	Acet-aldehyde	Benzene	Ethylbenzene	Formaldehyde	n-Hexane	Propylene	Toluene	Xylenes	PM10	Bromine	Chlorine	Chromium (hex)	Copper	Manganese	Nickel	Sulfates	Zinc
		75070	71432	100414	50000	110543	115071	108883	1330207		7726956	7782505	18540299	7440508	7439965	7440020	9960	7440666
Baseline 2015	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to HF Ramps	2.14E+03	6.42E-01	2.36E+00	2.14E-01	1.73E+01	4.28E-01	3.62E+01	8.56E-01	4.28E-01	3.33E+02	1.66E-01	2.33E+01	8.32E-03	1.66E-01	1.66E-01	1.66E-01	1.50E+02	1.66E-01
Henry Ford Ramps	2.29E+02	6.87E-02	2.52E-01	2.29E-02	1.85E+00	4.58E-02	3.87E+00	9.16E-02	4.58E-02	3.56E+01	1.78E-02	2.49E+00	8.89E-04	1.78E-02	1.78E-02	1.78E-02	1.60E+01	1.78E-02
Henry Ford n/o Ramps to Alameda	1.16E+03	3.49E-01	1.28E+00	1.16E-01	9.44E+00	2.33E-01	1.97E+01	4.66E-01	2.33E-01	1.81E+02	9.05E-02	1.27E+01	4.53E-03	9.05E-02	9.05E-02	9.05E-02	8.15E+01	9.05E-02
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.29E+03	3.87E-01	1.42E+00	1.29E-01	1.05E+01	2.58E-01	2.18E+01	5.16E-01	2.58E-01	2.01E+02	1.00E-01	1.40E+01	5.01E-03	1.00E-01	1.00E-01	1.00E-01	9.03E+01	1.00E-01
SR-103 Anaheim to PCH	8.86E+02	2.66E-01	9.75E-01	8.86E-02	7.18E+00	1.77E-01	1.50E+01	3.55E-01	1.77E-01	1.38E+02	6.89E-02	9.64E+00	3.44E-03	6.89E-02	6.89E-02	6.89E-02	6.20E+01	6.89E-02
SR-103 PCH to Sepulveda/Willow	8.80E+02	2.64E-01	9.68E-01	8.80E-02	7.13E+00	1.76E-01	1.49E+01	3.52E-01	1.76E-01	1.37E+02	6.84E-02	9.58E+00	3.42E-03	6.84E-02	6.84E-02	6.84E-02	6.16E+01	6.84E-02
E and W Harry Bridges, Figueroa to start Alameda	1.36E+03	4.08E-01	1.49E+00	1.36E-01	1.10E+01	2.72E-01	2.30E+01	5.44E-01	2.72E-01	2.11E+02	1.06E-01	1.48E+01	5.28E-03	1.06E-01	1.06E-01	1.06E-01	9.50E+01	1.06E-01
Alameda beginning (E Harry Bridges) to Anaheim	8.36E+02	2.51E-01	9.19E-01	8.36E-02	6.77E+00	1.67E-01	1.41E+01	3.34E-01	1.67E-01	1.30E+02	6.49E-02	9.09E+00	3.25E-03	6.49E-02	6.49E-02	6.49E-02	5.84E+01	6.49E-02
Alameda Anaheim to Henry Ford	2.96E+02	8.87E-02	3.25E-01	2.96E-02	2.39E+00	5.91E-02	5.00E+00	1.18E-01	5.91E-02	4.59E+01	2.30E-02	3.22E+00	1.15E-03	2.30E-02	2.30E-02	2.30E-02	2.07E+01	2.30E-02
Alameda Henry Ford to PCH	7.54E+02	2.26E-01	8.30E-01	7.54E-02	6.11E+00	1.51E-01	1.27E+01	3.02E-01	1.51E-01	1.17E+02	5.86E-02	8.21E+00	2.93E-03	5.86E-02	5.86E-02	5.86E-02	5.28E+01	5.86E-02
Alameda PCH to 405	4.92E+03	1.48E+00	5.41E+00	4.92E-01	3.98E+01	9.84E-01	8.31E+01	1.97E+00	9.84E-01	7.64E+02	3.82E-01	5.35E+01	1.91E-02	3.82E-01	3.82E-01	3.82E-01	3.44E+02	3.82E-01
Alameda 405 to del Amo	1.96E+03	5.87E-01	2.15E+00	1.96E-01	1.58E+01	3.91E-01	3.31E+01	7.83E-01	3.91E-01	3.04E+02	1.52E-01	2.13E+01	7.60E-03	1.52E-01	1.52E-01	1.52E-01	1.37E+02	1.52E-01
Alameda, del Amo to South Santa Fe Avenue	5.70E+02	1.71E-01	6.27E-01	5.70E-02	4.62E+00	1.14E-01	9.63E+00	2.28E-01	1.14E-01	8.86E+01	4.43E-02	6.20E+00	2.21E-03	4.43E-02	4.43E-02	4.43E-02	3.99E+01	4.43E-02
Alameda, South Santa Fe Avenue to SR-91	7.39E+02	2.22E-01	8.13E-01	7.39E-02	5.99E+00	1.48E-01	1.25E+01	2.96E-01	1.48E-01	1.15E+02	5.74E-02	8.04E+00	2.87E-03	5.74E-02	5.74E-02	5.74E-02	5.17E+01	5.74E-02
I-110, "C" Street Interchange to Anaheim	1.39E+03	4.18E-01	1.53E+00	1.39E-01	1.13E+01	2.79E-01	2.35E+01	5.57E-01	2.79E-01	2.16E+02	1.08E-01	1.52E+01	5.41E-03	1.08E-01	1.08E-01	1.08E-01	9.74E+01	1.08E-01
I-110, Anaheim to PCH	2.32E+03	6.97E-01	2.56E+00	2.32E-01	1.88E+01	4.65E-01	3.93E+01	9.29E-01	4.65E-01	3.61E+02	1.80E-01	2.53E+01	9.02E-03	1.80E-01	1.80E-01	1.80E-01	1.62E+02	1.80E-01
1-110, PCH to Sepulveda	4.14E+03	1.24E+00	4.55E+00	4.14E-01	3.35E+01	8.27E-01	6.99E+01	1.65E+00	8.27E-01	6.43E+02	3.21E-01	4.50E+01	1.61E-02	3.21E-01	3.21E-01	3.21E-01	2.89E+02	3.21E-01
I-110, Sepulveda to Carson	4.33E+03	1.30E+00	4.76E+00	4.33E-01	3.50E+01	8.65E-01	7.31E+01	1.73E+00	8.65E-01	6.72E+02	3.36E-01	4.71E+01	1.68E-02	3.36E-01	3.36E-01	3.36E-01	3.03E+02	3.36E-01
I-110, Carson to Del Amo	2.74E+03	8.22E-01	3.01E+00	2.74E-01	2.22E+01	5.48E-01	4.63E+01	1.10E+00	5.48E-01	4.26E+02	2.13E-01	2.98E+01	1.06E-02	2.13E-01	2.13E-01	2.13E-01	1.92E+02	2.13E-01
I-110, Del Amo to 405	1.62E+03	4.85E-01	1.78E+00	1.62E-01	1.31E+01	3.23E-01	2.73E+01	6.47E-01	3.23E-01	2.51E+02	1.26E-01	1.76E+01	6.28E-03	1.26E-01	1.26E-01	1.26E-01	1.13E+02	1.26E-01
I-110, 405 to SR-91	2.21E+03	6.62E-01	2.43E+00	2.21E-01	1.79E+01	4.42E-01	3.73E+01	8.83E-01	4.42E-01	3.43E+02	1.72E-01	2.40E+01	8.58E-03	1.72E-01	1.72E-01	1.72E-01	1.54E+02	1.72E-01
I-710, Anaheim to PCH	4.22E+03	1.27E+00	4.64E+00	4.22E-01	3.42E+01	8.44E-01	7.13E+01	1.69E+00	8.44E-01	6.56E+02	3.28E-01	4.59E+01	1.64E-02	3.28E-01	3.28E-01	3.28E-01	2.95E+02	3.28E-01
I-710, PCH to Willow	8.89E+03	2.67E+00	9.78E+00	8.89E-01	7.20E+01	1.78E+00	1.50E+02	3.55E+00	1.78E+00	1.38E+03	6.91E-01	9.67E+01	3.45E-02	6.91E-01	6.91E-01	6.91E-01	6.21E+02	6.91E-01
I-710, Willow to 405	1.34E+04	4.02E+00	1.47E+01	1.34E+00	1.09E+02	2.68E+00	2.26E+02	5.36E+00	2.68E+00	2.08E+03	1.04E+00	1.46E+02	5.20E-02	1.04E+00	1.04E+00	1.04E+00	9.37E+02	1.04E+00
I-710, 405 to Del Amo	1.17E+04	3.50E+00	1.28E+01	1.17E+00	9.45E+01	2.33E+00	1.97E+02	4.66E+00	2.33E+00	1.81E+03	9.06E-01	1.27E+02	4.53E-02	9.06E-01	9.06E-01	9.06E-01	8.15E+02	9.06E-01
I-710, Del Amo to Long Beach Blvd Interchange	9.43E+03	2.83E+00	1.04E+01	9.43E-01	7.64E+01	1.89E+00	1.59E+02	3.77E+00	1.89E+00	1.47E+03	7.33E-01	1.03E+02	3.66E-02	7.33E-01	7.33E-01	7.33E-01	6.60E+02	7.33E-01
I-710, Long Beach Boulevard to SR-91	7.62E+03	2.28E+00	8.38E+00	7.62E-01	6.17E+01	1.52E+00	1.29E+02	3.05E+00	1.52E+00	1.18E+03	5.92E-01	8.28E+01	2.96E-02	5.92E-01	5.92E-01	5.92E-01	5.33E+02	5.92E-01
PCH, I110 to Alameda	8.67E+02	2.60E-01	9.53E-01	8.67E-02	7.02E+00	1.73E-01	1.46E+01	3.47E-01	1.73E-01	1.35E+02	6.73E-02	9.43E+00	3.37E-03	6.73E-02	6.73E-02	6.73E-02	6.06E+01	6.73E-02
PCH, Alameda to SR-103	1.68E+02	5.04E-02	1.85E-01	1.68E-02	1.36E+00	3.36E-02	2.84E+00	6.71E-02	3.36E-02	2.61E+01	1.30E-02	1.83E+00	6.52E-04	1.30E-02	1.30E-02	1.30E-02	1.17E+01	1.30E-02
PCH, SR-103 to I-710	1.06E+03	3.18E-01	1.17E+00	1.06E-01	8.58E+00	2.12E-01	1.79E+01	4.24E-01	2.12E-01	1.65E+02	8.23E-02	1.15E+01	4.12E-03	8.23E-02	8.23E-02	8.23E-02	7.41E+01	8.23E-02
Sepulveda, I-110 to Avalon	8.82E+01	2.65E-02	9.70E-02	8.82E-03	7.14E-01	1.76E-02	1.49E+00	3.53E-02	1.76E-02	1.37E+01	6.85E-03	9.59E-01	3.43E-04	6.85E-03	6.85E-03	6.85E-03	6.17E+00	6.85E-03
Sepulveda, Avalon to Alameda	6.33E+01	1.90E-02	6.96E-02	6.33E-03	5.13E-01	1.27E-02	1.07E+00	2.53E-02	1.27E-02	9.83E+00	4.92E-03	6.88E-01	2.46E-04	4.92E-03	4.92E-03	4.92E-03	4.43E+00	4.92E-03
Sepulveda, Alameda to ICTF	2.43E+02	7.29E-02	2.67E-01	2.43E-02	1.97E+00	4.86E-02	4.11E+00	9.72E-02	4.86E-02	3.78E+01	1.89E-02	2.64E+00	9.44E-04	1.89E-02	1.89E-02	1.89E-02	1.70E+01	1.89E-02
Sepulveda, ICTF to SR-103	1.48E+02	4.44E-02	1.63E-01	1.48E-02	1.20E+00	2.96E-02	2.50E+00	5.93E-02	2.96E-02	2.30E+01	1.15E-02	1.61E+00	5.76E-04	1.15E-02	1.15E-02	1.15E-02	1.04E+01	1.15E-02
Del Amo, I-110 to Wilmington	7.25E+01	2.18E-02	7.98E-02	7.25E-03	5.88E-01	1.45E-02	1.23E+00	2.90E-02	1.45E-02	1.13E+01	5.64E-03	7.89E-01	2.82E-04	5.64E-03	5.64E-03	5.64E-03	5.07E+00	5.64E-03
Del Amo, Wilmington to Alameda	2.20E+02	6.61E-02	2.42E-01	2.20E-02	1.79E+00	4.41E-02	3.73E+00	8.82E-02	4.41E-02	3.43E+01	1.71E-02	2.40E+00	8.56E-04	1.71E-02	1.71E-02	1.71E-02	1.54E+01	1.71E-02
Del Amo, Alameda to I-710	1.73E+02	5.18E-02	1.90E-01	1.73E-02	1.40E+00	3.45E-02	2.92E+00	6.91E-02	3.45E-02	2.68E+01	1.34E-02	1.88E+00	6.71E-04	1.34E-02	1.34E-02	1.34E-02	1.21E+01	1.34E-02
223rd Street, I-110 to Avalon	1.66E+01	4.97E-03	1.82E-02	1.66E-03	1.34E-01	3.32E-03	2.80E-01	6.63E-03	3.32E-03	2.58E+00	1.29E-03	1.80E-01	6.44E-05	1.29E-03	1.29E-03	1.29E-03	1.16E+00	1.29E-03
223rd Street, Avalon to Wilmington	1.37E+01	4.12E-03	1.51E-02	1.37E-03	1.11E-01	2.75E-03	2.32E-01	5.50E-03	2.75E-03	2.14E+00	1.07E-03	1.49E-01	5.34E-05	1.07E-03	1.07E-03	1.07E-03	9.61E-01	1.07E-03
223rd Street, Wilmington to Alameda	9.28E+01	2.78E-02	1.02E-01	9.28E-03	7.52E-01	1.86E-02	1.57E+00	3.71E-02	1.86E-02	1.44E+01	7.21E-03	1.01E+00	3.61E-04	7.21E-03	7.21E-03	7.21E-03	6.49E+00	7.21E-03
W Wardlow from Alameda to I-710	4.10E+01	1.23E-02	4.51E-02	4.10E-03	3.32E-01	8.20E-03	6.93E-01	1.64E-02	8.20E-03	6.37E+00	3.19E-03	4.46E-01	1.59E-04	3.19E-03	3.19E-03	3.19E-03	2.87E+00	3.19E-03

Table B-1
2015 No Build
Annual Average Truck Emissions

	SCAG - Gasoline Trucks					
	TOG	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
		71432	50000	106990	75070	107028
Baseline 2015	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to HF Ramps	3.34E+00	8.13E-02	5.71E-02	1.85E-02	1.29E-02	4.37E-03
Henry Ford Ramps	2.57E-02	6.27E-04	4.40E-04	1.42E-04	9.91E-05	3.37E-05
Henry Ford n/o Ramps to Alameda	1.16E-01	2.83E-03	1.99E-03	6.43E-04	4.48E-04	1.52E-04
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	4.16E+00	1.01E-01	7.11E-02	2.30E-02	1.60E-02	5.45E-03
SR-103 Anaheim to PCH	3.85E+00	9.38E-02	6.58E-02	2.13E-02	1.48E-02	5.04E-03
SR-103 PCH to Sepulveda/Willow	9.39E+00	2.29E-01	1.61E-01	5.19E-02	3.62E-02	1.23E-02
E and W Harry Bridges, Figueroa to start Alameda	2.13E+01	5.18E-01	3.64E-01	1.18E-01	8.19E-02	2.79E-02
Alameda beginning (E Harry Bridges) to Anaheim	4.85E+01	1.18E+00	8.30E-01	2.68E-01	1.87E-01	6.36E-02
Alameda Anaheim to Henry Ford	2.45E+01	5.97E-01	4.19E-01	1.36E-01	9.43E-02	3.21E-02
Alameda Henry Ford to PCH	2.00E+01	4.87E-01	3.42E-01	1.11E-01	7.70E-02	2.62E-02
Alameda PCH to 405	3.15E+02	7.67E+00	5.38E+00	1.74E+00	1.21E+00	4.12E-01
Alameda 405 to del Amo	1.94E+02	4.73E+00	3.32E+00	1.07E+00	7.47E-01	2.54E-01
Alameda, del Amo to South Santa Fe Avenue	5.78E+01	1.41E+00	9.88E-01	3.20E-01	2.23E-01	7.57E-02
Alameda, South Santa Fe Avenue to SR-91	6.78E+01	1.65E+00	1.16E+00	3.75E-01	2.61E-01	8.88E-02
I-110, "C" Street Interchange to Anaheim	9.58E+01	2.33E+00	1.64E+00	5.30E-01	3.69E-01	1.25E-01
I-110, Anaheim to PCH	1.79E+02	4.35E+00	3.05E+00	9.87E-01	6.87E-01	2.34E-01
1-110, PCH to Sepulveda	4.51E+02	1.10E+01	7.72E+00	2.50E+00	1.74E+00	5.91E-01
I-110, Sepulveda to Carson	6.89E+02	1.68E+01	1.18E+01	3.81E+00	2.65E+00	9.03E-01
I-110, Carson to Del Amo	5.19E+02	1.26E+01	8.87E+00	2.87E+00	2.00E+00	6.79E-01
I-110, Del Amo to 405	3.78E+02	9.20E+00	6.46E+00	2.09E+00	1.45E+00	4.95E-01
I-110, 405 to SR-91	8.71E+02	2.12E+01	1.49E+01	4.82E+00	3.35E+00	1.14E+00
I-710, Anaheim to PCH	1.32E+02	3.22E+00	2.26E+00	7.31E-01	5.09E-01	1.73E-01
I-710, PCH to Willow	3.06E+02	7.46E+00	5.24E+00	1.69E+00	1.18E+00	4.01E-01
I-710, Willow to 405	4.69E+02	1.14E+01	8.03E+00	2.60E+00	1.81E+00	6.15E-01
I-710, 405 to Del Amo	6.64E+02	1.62E+01	1.14E+01	3.67E+00	2.56E+00	8.70E-01
I-710, Del Amo to Long Beach Blvd Interchange	6.05E+02	1.47E+01	1.03E+01	3.34E+00	2.33E+00	7.92E-01
I-710, Long Beach Boulevard to SR-91	5.10E+02	1.24E+01	8.72E+00	2.82E+00	1.96E+00	6.68E-01
PCH, I110 to Alameda	2.18E+02	5.30E+00	3.72E+00	1.20E+00	8.37E-01	2.85E-01
PCH, Alameda to SR-103	2.66E+01	6.48E-01	4.55E-01	1.47E-01	1.02E-01	3.48E-02
PCH, SR-103 to I-710	5.30E+01	1.29E+00	9.06E-01	2.93E-01	2.04E-01	6.94E-02
Sepulveda, I-110 to Avalon	7.45E+01	1.81E+00	1.27E+00	4.12E-01	2.87E-01	9.76E-02
Sepulveda, Avalon to Alameda	6.86E+01	1.67E+00	1.17E+00	3.79E-01	2.64E-01	8.99E-02
Sepulveda, Alameda to ICTF	1.88E+01	4.59E-01	3.22E-01	1.04E-01	7.25E-02	2.47E-02
Sepulveda, ICTF to SR-103	3.76E+00	9.15E-02	6.43E-02	2.08E-02	1.45E-02	4.92E-03
Del Amo, I-110 to Wilmington	1.25E+02	3.04E+00	2.13E+00	6.90E-01	4.80E-01	1.63E-01
Del Amo, Wilmington to Alameda	1.17E+02	2.86E+00	2.01E+00	6.49E-01	4.52E-01	1.54E-01
Del Amo, Alameda to I-710	1.05E+02	2.55E+00	1.79E+00	5.79E-01	4.03E-01	1.37E-01
223rd Street, I-110 to Avalon	5.88E+01	1.43E+00	1.01E+00	3.25E-01	2.26E-01	7.70E-02
223rd Street, Avalon to Wilmington	4.89E+01	1.19E+00	8.37E-01	2.71E-01	1.88E-01	6.41E-02
223rd Street, Wilmington to Alameda	4.87E+01	1.19E+00	8.34E-01	2.70E-01	1.88E-01	6.39E-02
W Wardlow from Alameda to I-710	3.59E+01	8.75E-01	6.14E-01	1.99E-01	1.38E-01	4.71E-02

Table B-2
2015 Alternative 1
Annual Average Truck Emissions

	Length	Average Speed	Port AADT Trucks	SCAG AADT Trucks	Port LNG Trucks	Port DSL Trucks	SCAG Gasoline Trucks	SCAG Diesel Trucks
Alternative 1, 2015	mile	mph	veh/day	veh/day	veh/day	veh/day	veh/day	veh/day
SR-47 Mainline, New Dock Ramps to Transition		55	22045	331	8818	13227		
New Dock Ramps - Cerritos Channel (A1 Line)	0.24	55	22045	331	8818	13227	173	158
SB Cerritos Channel - Transition (G1 Line)	0.13	55	11022.5	165.5	4409	6614	87	79
NB Cerritos Channel - Transition (E1 Line)	0.15	55	11022.5	165.5	4409	6614	87	79
Mainline Transition to HF Ramps & SR-103		55	6865	115	2746	4119		
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	0.23	55	3432.5	57.5	1373	2060	30	27
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	0.20	55	3432.5	57.5	1373	2060	30	27
Henry Ford Exit and Entrance Ramps	0.31	25	1592	2	637	955	1	1
Henry Ford n/o Ramps to Alameda	0.68	25	2880	0	1152	1728	0	0
SR-47 Extension, HF Ramps to Alameda		50	15183	218	6073	9110		
SB, 103 Split to Dominguex Channel (D1 Line)	0.70	50	7591.5	109	3037	4555	57	52
NB, 103 Split to Dominguex Channel (F1 Line)	0.69	50	7591.5	109	3037	4555	57	52
Dominguex Channel - Alameda (I1 Line)	0.83	50	15183	218	6073	9110	114	104
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.10	45	5273	113	2109	3164	59	54
SR-103 Anaheim to PCH	0.57	45	6353	190	2541	3812	99	91
SR-103 PCH to Sepulveda/Willow	1.02	45	4469	311	1788	2681	163	148
E and W Harry Bridges, Figueroa to start Alameda	1.44	45	3288	208	1315	1973	109	99
Alameda beginning (E Harry Bridges) to Anaheim	0.77	45	5575	614	2230	3345	321	293
Alameda Anaheim to Henry Ford	0.42	45	3603	609	1441	2162	319	290
Alameda, Henry Ford to PCH	0.34	45	5543	611	2217	3326	320	291
Alameda PCH to 405	2.27	45	19585	1741	7834	11751	911	830
Alameda 405 to del Amo	1.72	45	7383	1431	2953	4430	748	683
Alameda, del Amo to South Santa Fe Avenue	0.84	45	4682	865	1873	2809	452	413
Alameda, South Santa Fe Avenue to SR-91	1.15	45	4438	731	1775	2663	382	349
I-110, "C" Street Interchange to Anaheim	0.49	65	12841	2691	5136	7705	1407	1284
I-110, Anaheim to PCH	0.80	65	13204	3127	5282	7922	1635	1492
1-110, PCH to Sepulveda	1.39	65	13974	4705	5590	8384	2461	2244
I-110, Sepulveda to Carson	1.56	65	13091	6364	5236	7855	3328	3036
I-110, Carson to Del Amo	1.02	65	12598	7301	5039	7559	3818	3483
I-110, Del Amo to 405	0.74	65	10439	7306	4176	6263	3821	3485
I-110, 405 to SR-91	1.09	65	10249	11392	4100	6149	5958	5434
I-710, Anaheim to PCH	0.50	65	39908	3678	15963	23945	1924	1754
I-710, PCH to Willow	1.01	65	40444	4317	16178	24266	2258	2059
I-710, Willow to 405	1.52	65	40217	4392	16087	24130	2297	2095
I-710, 405 to Del Amo	1.42	65	42098	6700	16839	25259	3504	3196
I-710, Del Amo to Long Beach Blvd Interchange	1.17	65	41376	7392	16550	24826	3866	3526
I-710, Long Beach Boulevard to SR-91	0.96	65	41078	7589	16431	24647	3969	3620
PCH, I110 to Alameda	2.38	50	2002	1082	801	1201	566	516
PCH, Alameda to SR-103	0.94	50	367	432	147	220	226	206
PCH, SR-103 to I-710	0.98	50	3182	319	1273	1909	167	152
Sepulveda, I-110 to Avalon	1.37	40	300	623	120	180	326	297
Sepulveda, Avalon to Alameda	1.70	40	201	460	80	121	241	219
Sepulveda, Alameda to ICTF	0.67	40	1410	315	564	846	165	150
Sepulveda, ICTF to SR-103	0.17	40	4469	252	1788	2681	132	120
Del Amo, I-110 to Wilmington	2.96	40	110	469	44	66	245	224
Del Amo, Wilmington to Alameda	0.77	40	1538	1752	615	923	916	836
Del Amo, Alameda to I-710	0.87	40	799	1839	320	479	962	877
223rd Street, I-110 to Avalon	1.36	45	71	549	28	43	287	262
223rd Street, Avalon to Wilmington	1.23	45	56	508	22	34	266	242
223rd Street, Wilmington to Alameda	0.79	45	1173	805	469	704	421	384
W Wardlow from Alameda to I-710	1.30	45	829	503	332	497	263	240

Table B-2
2015 Alternative 1
Annual Average Truck Emissions

	Port	Port	Port	Port	SCAG		Port	Port	Port	SCAG	
	LNG TOG	LNG PM10	LNG DPM	Dsl Exhst PM	Gasoline TOG	Dsl Exhst PM	LNG TOG	LNG PM10	LNG+DSL DPM	Gasoline TOG	Dsl Exhst PM
Alternative 1, 2015	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	lb/yr	lb/yr	lb/year	lb/year	lb/year
SR-47 Mainline, New Dock Ramps to Transition											
New Dock Ramps - Cerritos Channel (A1 Line)	0.590	0.092	0.005	0.092	0.162	0.153	1005.510	156.257	242.7	5.4	4.7
SB Cerritos Channel - Transition (G1 Line)	0.590	0.092	0.005	0.092	0.162	0.153	272.326	42.319	65.7	1.5	1.3
NB Cerritos Channel - Transition (E1 Line)	0.590	0.092	0.005	0.092	0.162	0.153	314.222	48.830	75.9	1.7	1.5
Mainline Transition to HF Ramps & SR-103											
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	0.590	0.092	0.005	0.092	0.162	0.153	150.039	23.316	36.2	0.9	0.8
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	0.590	0.092	0.005	0.092	0.162	0.153	130.468	20.275	31.5	0.8	0.7
Henry Ford Exit and Entrance Ramps	0.590	0.092	0.005	0.054	0.403	0.122	93.793	14.575	13.6	0.1	0.0
Henry Ford n/o Ramps to Alameda	0.590	0.092	0.005	0.054	0.403	0.122	372.191	57.839	54.1	0.0	0.0
SR-47 Extension, HF Ramps to Alameda											
SB, 103 Split to Dominguex Channel (D1 Line)	0.590	0.092	0.005	0.080	0.170	0.138	1009.929	156.943	213.8	5.5	4.0
NB, 103 Split to Dominguex Channel (F1 Line)	0.590	0.092	0.005	0.080	0.170	0.138	995.501	154.701	210.7	5.4	4.0
Dominguex Channel - Alameda (I1 Line)	0.590	0.092	0.005	0.080	0.170	0.138	2394.974	372.180	506.9	13.0	9.6
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	0.590	0.092	0.005	0.070	0.186	0.126	1102.340	171.304	205.6	9.7	6.0
SR-103 Anaheim to PCH	0.590	0.092	0.005	0.070	0.186	0.126	688.206	106.948	128.4	8.5	5.3
SR-103 PCH to Sepulveda/Willow	0.590	0.092	0.005	0.070	0.186	0.126	866.314	134.626	161.6	24.8	15.4
E and W Harry Bridges, Figueroa to start Alameda	0.590	0.092	0.005	0.070	0.186	0.126	902.007	140.172	168.2	23.5	14.6
Alameda beginning (E Harry Bridges) to Anaheim	0.590	0.092	0.005	0.070	0.186	0.126	815.629	126.749	152.1	37.0	22.9
Alameda Anaheim to Henry Ford	0.590	0.092	0.005	0.070	0.186	0.126	288.869	44.890	53.9	20.1	12.5
Alameda, Henry Ford to PCH	0.590	0.092	0.005	0.070	0.186	0.126	361.969	56.250	67.5	16.4	10.2
Alameda PCH to 405	0.590	0.092	0.005	0.070	0.186	0.126	8436.833	1311.087	1573.6	309.0	191.5
Alameda 405 to del Amo	0.590	0.092	0.005	0.070	0.186	0.126	2414.981	375.289	450.4	192.9	119.5
Alameda, del Amo to South Santa Fe Avenue	0.590	0.092	0.005	0.070	0.186	0.126	748.049	116.247	139.5	56.9	35.3
Alameda, South Santa Fe Avenue to SR-91	0.590	0.092	0.005	0.070	0.186	0.126	972.672	151.154	181.4	66.0	40.9
I-110, "C" Street Interchange to Anaheim	0.590	0.092	0.005	0.122	0.166	0.194	1200.374	186.539	383.1	92.5	98.6
I-110, Anaheim to PCH	0.590	0.092	0.005	0.122	0.166	0.194	2015.335	313.184	643.2	175.4	187.0
1-110, PCH to Sepulveda	0.590	0.092	0.005	0.122	0.166	0.194	3681.504	572.107	1174.9	455.7	485.6
I-110, Sepulveda to Carson	0.590	0.092	0.005	0.122	0.166	0.194	3874.546	602.106	1236.5	692.4	737.9
I-110, Carson to Del Amo	0.590	0.092	0.005	0.122	0.166	0.194	2446.183	380.138	780.7	521.1	555.4
I-110, Del Amo to 405	0.590	0.092	0.005	0.122	0.166	0.194	1470.040	228.445	469.1	378.2	403.1
I-110, 405 to SR-91	0.590	0.092	0.005	0.122	0.166	0.194	2128.769	330.812	679.4	869.8	927.0
I-710, Anaheim to PCH	0.590	0.092	0.005	0.122	0.166	0.194	3788.053	588.665	1208.9	128.3	136.8
I-710, PCH to Willow	0.590	0.092	0.005	0.122	0.166	0.194	7727.691	1200.886	2466.2	303.2	323.2
I-710, Willow to 405	0.590	0.092	0.005	0.122	0.166	0.194	11641.880	1809.152	3715.3	467.4	498.1
I-710, 405 to Del Amo	0.590	0.092	0.005	0.122	0.166	0.194	11356.939	1764.872	3624.4	664.4	708.1
I-710, Del Amo to Long Beach Blvd Interchange	0.590	0.092	0.005	0.122	0.166	0.194	9232.160	1434.681	2946.3	606.3	646.2
I-710, Long Beach Boulevard to SR-91	0.590	0.092	0.005	0.122	0.166	0.194	7501.952	1165.806	2394.1	509.5	543.0
PCH, I110 to Alameda	0.590	0.092	0.005	0.080	0.170	0.138	905.139	140.659	191.6	184.6	136.1
PCH, Alameda to SR-103	0.590	0.092	0.005	0.080	0.170	0.138	65.669	10.205	13.9	29.2	21.5
PCH, SR-103 to I-710	0.590	0.092	0.005	0.080	0.170	0.138	593.594	92.245	125.6	22.5	16.6
Sepulveda, I-110 to Avalon	0.590	0.092	0.005	0.063	0.213	0.119	78.057	12.130	13.1	76.4	39.0
Sepulveda, Avalon to Alameda	0.590	0.092	0.005	0.063	0.213	0.119	64.897	10.085	10.9	70.0	35.7
Sepulveda, Alameda to ICTF	0.590	0.092	0.005	0.063	0.213	0.119	180.727	28.085	30.4	19.0	9.7
Sepulveda, ICTF to SR-103	0.590	0.092	0.005	0.063	0.213	0.119	145.566	22.621	24.5	3.9	2.0
Del Amo, I-110 to Wilmington	0.590	0.092	0.005	0.063	0.213	0.119	61.856	9.613	10.4	124.2	63.4
Del Amo, Wilmington to Alameda	0.590	0.092	0.005	0.063	0.213	0.119	223.765	34.773	37.6	120.1	61.3
Del Amo, Alameda to I-710	0.590	0.092	0.005	0.063	0.213	0.119	132.432	20.580	22.3	143.6	73.2
223rd Street, I-110 to Avalon	0.590	0.092	0.005	0.070	0.186	0.126	18.393	2.858	3.4	58.6	36.3
223rd Street, Avalon to Wilmington	0.590	0.092	0.005	0.070	0.186	0.126	13.042	2.027	2.4	48.7	30.2
223rd Street, Wilmington to Alameda	0.590	0.092	0.005	0.070	0.186	0.126	175.900	27.335	32.8	49.7	30.8
W Wardlow from Alameda to I-710	0.590	0.092	0.005	0.070	0.186	0.126	204.792	31.825	38.2	51.2	31.7

Table B-2
2015 Alternative 1
Annual Average Truck Emissions

	Total Average Annual Toxic Emissions from Trucks																	
	DPM	Acet-aldehyde	Acrolein	Benzene	Bromine	1,3-Butadiene	Chlorine	Chromium	Copper	Form-aldehyde	n-Hexane	Manganese	Nickel	Propylene	Sulfates	Toluene	Xylenes	Zinc
	9901	75070	107028	71432	7726956	106990	7782505	18540299	7440508	50000	110543	7439965	7440020	115071	9960	108883	1330207	7440666
Alternative 1, 2015	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to Transition																		
New Dock Ramps - Cerritos Channel (A1 Line)	2.47E+02	3.22E-01	7.08E-03	1.24E+00	7.81E-02	2.99E-02	1.09E+01	3.91E-03	7.81E-02	8.24E+00	2.01E-01	7.81E-02	7.81E-02	1.70E+01	7.03E+01	4.02E-01	2.01E-01	7.81E-02
SB Cerritos Channel - Transition (G1 Line)	6.70E+01	8.73E-02	1.92E-03	3.35E-01	2.12E-02	8.09E-03	2.96E+00	1.06E-03	2.12E-02	2.23E+00	5.45E-02	2.12E-02	2.12E-02	4.60E+00	1.90E+01	1.09E-01	5.45E-02	2.12E-02
NB Cerritos Channel - Transition (E1 Line)	7.73E+01	1.01E-01	2.21E-03	3.87E-01	2.44E-02	9.34E-03	3.42E+00	1.22E-03	2.44E-02	2.57E+00	6.28E-02	2.44E-02	2.44E-02	5.31E+00	2.20E+01	1.26E-01	6.28E-02	2.44E-02
Mainline Transition to HF Ramps & SR-103																		
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	3.70E+01	4.85E-02	1.18E-03	1.87E-01	1.17E-02	4.97E-03	1.63E+00	5.83E-04	1.17E-02	1.23E+00	3.00E-02	1.17E-02	1.17E-02	2.54E+00	1.05E+01	6.00E-02	3.00E-02	1.17E-02
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	3.22E+01	4.22E-02	1.02E-03	1.63E-01	1.01E-02	4.32E-03	1.42E+00	5.07E-04	1.01E-02	1.07E+00	2.61E-02	1.01E-02	1.01E-02	2.20E+00	9.12E+00	5.22E-02	2.61E-02	1.01E-02
Henry Ford Exit and Entrance Ramps	1.37E+01	2.85E-02	1.38E-04	1.06E-01	7.29E-03	5.82E-04	1.02E+00	3.64E-04	7.29E-03	7.62E-01	1.88E-02	7.29E-03	7.29E-03	1.59E+00	6.56E+00	3.75E-02	1.88E-02	7.29E-03
Henry Ford n/o Ramps to Alameda	5.41E+01	1.12E-01	0.00E+00	4.09E-01	2.89E-02	0.00E+00	4.05E+00	1.45E-03	2.89E-02	3.01E+00	7.44E-02	2.89E-02	2.89E-02	6.29E+00	2.60E+01	1.49E-01	7.44E-02	2.89E-02
SR-47 Extension, HF Ramps to Alameda																		
SB, 103 Split to Dominguex Channel (D1 Line)	2.18E+02	3.24E-01	7.17E-03	1.24E+00	7.85E-02	3.03E-02	1.10E+01	3.92E-03	7.85E-02	8.27E+00	2.02E-01	7.85E-02	7.85E-02	1.71E+01	7.06E+01	4.04E-01	2.02E-01	7.85E-02
NB, 103 Split to Dominguex Channel (F1 Line)	2.15E+02	3.19E-01	7.07E-03	1.23E+00	7.74E-02	2.98E-02	1.08E+01	3.87E-03	7.74E-02	8.16E+00	1.99E-01	7.74E-02	7.74E-02	1.68E+01	6.96E+01	3.98E-01	1.99E-01	7.74E-02
Dominguex Channel - Alameda (I1 Line)	5.17E+02	7.68E-01	1.70E-02	2.95E+00	1.86E-01	7.18E-02	2.61E+01	9.30E-03	1.86E-01	1.96E+01	4.79E-01	1.86E-01	1.86E-01	4.05E+01	1.67E+02	9.58E-01	4.79E-01	1.86E-01
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	2.12E+02	3.68E-01	1.27E-02	1.45E+00	8.57E-02	5.38E-02	1.20E+01	4.28E-03	8.57E-02	9.10E+00	2.20E-01	8.57E-02	8.57E-02	1.86E+01	7.71E+01	4.41E-01	2.20E-01	8.57E-02
SR-103 Anaheim to PCH	1.34E+02	2.39E-01	1.11E-02	9.64E-01	5.35E-02	4.69E-02	7.49E+00	2.67E-03	5.35E-02	5.72E+00	1.38E-01	5.35E-02	5.35E-02	1.16E+01	4.81E+01	2.75E-01	1.38E-01	5.35E-02
SR-103 PCH to Sepulveda/Willow	1.77E+02	3.56E-01	3.25E-02	1.56E+00	6.73E-02	1.37E-01	9.42E+00	3.37E-03	6.73E-02	7.44E+00	1.73E-01	6.73E-02	6.73E-02	1.46E+01	6.06E+01	3.47E-01	1.73E-01	6.73E-02
E and W Harry Bridges, Figueroa to start Alameda	1.83E+02	3.61E-01	3.08E-02	1.56E+00	7.01E-02	1.30E-01	9.81E+00	3.50E-03	7.01E-02	7.71E+00	1.80E-01	7.01E-02	7.01E-02	1.52E+01	6.31E+01	3.61E-01	1.80E-01	7.01E-02
Alameda beginning (E Harry Bridges) to Anaheim	1.75E+02	3.87E-01	4.85E-02	1.80E+00	6.34E-02	2.05E-01	8.87E+00	3.17E-03	6.34E-02	7.24E+00	1.63E-01	6.34E-02	6.34E-02	1.38E+01	5.70E+01	3.26E-01	1.63E-01	6.34E-02
Alameda Anaheim to Henry Ford	6.63E+01	1.64E-01	2.64E-02	8.08E-01	2.24E-02	1.11E-01	3.14E+00	1.12E-03	2.24E-02	2.68E+00	5.78E-02	2.24E-02	2.24E-02	4.88E+00	2.02E+01	1.16E-01	5.78E-02	2.24E-02
Alameda, Henry Ford to PCH	7.77E+01	1.72E-01	2.15E-02	7.98E-01	2.81E-02	9.09E-02	3.94E+00	1.41E-03	2.81E-02	3.21E+00	7.24E-02	2.81E-02	2.81E-02	6.12E+00	2.53E+01	1.45E-01	7.24E-02	2.81E-02
Alameda PCH to 405	1.77E+03	3.72E+00	4.05E-01	1.68E+01	6.56E-01	1.71E+00	9.18E+01	3.28E-02	6.56E-01	7.36E+01	1.69E+00	6.56E-01	6.56E-01	1.43E+02	5.90E+02	3.37E+00	1.69E+00	6.56E-01
Alameda 405 to del Amo	5.70E+02	1.47E+00	2.53E-01	7.35E+00	1.88E-01	1.07E+00	2.63E+01	9.38E-03	1.88E-01	2.29E+01	4.83E-01	1.88E-01	1.88E-01	4.08E+01	1.69E+02	9.66E-01	4.83E-01	1.88E-01
Alameda, del Amo to South Santa Fe Avenue	1.75E+02	4.44E-01	7.46E-02	2.21E+00	5.81E-02	3.15E-01	8.14E+00	2.91E-03	5.81E-02	7.03E+00	1.50E-01	5.81E-02	5.81E-02	1.26E+01	5.23E+01	2.99E-01	1.50E-01	5.81E-02
Alameda, South Santa Fe Avenue to SR-91	2.22E+02	5.46E-01	8.65E-02	2.68E+00	7.56E-02	3.65E-01	1.06E+01	3.78E-03	7.56E-02	9.01E+00	1.95E-01	7.56E-02	7.56E-02	1.64E+01	6.80E+01	3.89E-01	1.95E-01	7.56E-02
I-110, "C" Street Interchange to Anaheim	4.82E+02	7.16E-01	1.21E-01	3.57E+00	9.33E-02	5.11E-01	1.31E+01	4.66E-03	9.33E-02	1.13E+01	2.40E-01	9.33E-02	9.33E-02	2.03E+01	8.39E+01	4.80E-01	2.40E-01	9.33E-02
I-110, Anaheim to PCH	8.30E+02	1.28E+00	2.30E-01	6.49E+00	1.57E-01	9.70E-01	2.19E+01	7.83E-03	1.57E-01	1.93E+01	4.03E-01	1.57E-01	1.57E-01	3.41E+01	1.41E+02	8.06E-01	4.03E-01	1.57E-01
1-110, PCH to Sepulveda	1.66E+03	2.86E+00	5.97E-01	1.51E+01	2.86E-01	2.52E+00	4.00E+01	1.43E-02	2.86E-01	3.76E+01	7.36E-01	2.86E-01	2.86E-01	6.22E+01	2.57E+02	1.47E+00	7.36E-01	2.86E-01
I-110, Sepulveda to Carson	1.97E+03	3.83E+00	9.07E-01	2.11E+01	3.01E-01	3.83E+00	4.21E+01	1.51E-02	3.01E-01	4.32E+01	7.75E-01	3.01E-01	3.01E-01	6.55E+01	2.71E+02	1.55E+00	7.75E-01	3.01E-01
I-110, Carson to Del Amo	1.34E+03	2.74E+00	6.83E-01	1.54E+01	1.90E-01	2.88E+00	2.66E+01	9.50E-03	1.90E-01	2.87E+01	4.89E-01	1.90E-01	1.90E-01	4.13E+01	1.71E+02	9.78E-01	4.89E-01	1.90E-01
I-110, Del Amo to 405	8.72E+02	1.90E+00	4.95E-01	1.08E+01	1.14E-01	2.09E+00	1.60E+01	5.71E-03	1.14E-01	1.84E+01	2.94E-01	1.14E-01	1.14E-01	2.48E+01	1.03E+02	5.88E-01	2.94E-01	1.14E-01
I-110, 405 to SR-91	1.61E+03	3.99E+00	1.14E+00	2.35E+01	1.65E-01	4.81E+00	2.32E+01	8.27E-03	1.65E-01	3.21E+01	4.26E-01	1.65E-01	1.65E-01	3.60E+01	1.49E+02	8.52E-01	4.26E-01	1.65E-01
I-710, Anaheim to PCH	1.35E+03	1.63E+00	1.68E-01	7.29E+00	2.94E-01	7.10E-01	4.12E+01	1.47E-02	2.94E-01	3.29E+01	7.58E-01	2.94E-01	2.94E-01	6.40E+01	2.65E+02	1.52E+00	7.58E-01	2.94E-01
I-710, PCH to Willow	2.79E+03	3.49E+00	3.97E-01	1.59E+01	6.00E-01	1.68E+00	8.41E+01	3.00E-02	6.00E-01	6.78E+01	1.55E+00	6.00E-01	6.00E-01	1.31E+02	5.40E+02	3.09E+00	1.55E+00	6.00E-01
I-710, Willow to 405	4.21E+03	5.29E+00	6.12E-01	2.42E+01	9.05E-01	2.58E+00	1.27E+02	4.52E-02	9.05E-01	1.02E+02	2.33E+00	9.05E-01	9.05E-01	1.97E+02	8.14E+02	4.66E+00	2.33E+00	9.05E-01
I-710, 405 to Del Amo	4.33E+03	5.97E+00	8.70E-01	2.87E+01	8.82E-01	3.67E+00	1.24E+02	4.41E-02	8.82E-01	1.03E+02	2.27E+00	8.82E-01	8.82E-01	1.92E+02	7.94E+02	4.54E+00	2.27E+00	8.82E-01
I-710, Del Amo to Long Beach Blvd Interchange	3.59E+03	5.10E+00	7.94E-01	2.49E+01	7.17E-01	3.35E+00	1.00E+02	3.59E-02	7.17E-01	8.51E+01	1.85E+00	7.17E-01	7.17E-01	1.56E+02	6.46E+02	3.69E+00	1.85E+00	7.17E-01
I-710, Long Beach Boulevard to SR-91	2.94E+03	4.21E+00	6.67E-01	2.07E+01	5.83E-01	2.82E+00	8.16E+01	2.91E-02	5.83E-01	6.95E+01	1.50E+00	5.83E-01	5.83E-01	1.27E+02	5.25E+02	3.00E+00	1.50E+00	5.83E-01
PCH, I110 to Alameda	3.28E+02	9.82E-01	2.42E-01	5.49E+00	7.03E-02	1.02E+00	9.85E+00	3.52E-03	7.03E-02	1.05E+01	1.81E-01	7.03E-02	7.03E-02	1.53E+01	6.33E+01	3.62E-01	1.81E-01	7.03E-02
PCH, Alameda to SR-103	3.54E+01	1.32E-01	3.82E-02	7.82E-01	5.10E-03	1.61E-01	7.14E-01	2.55E-04	5.10E-03	1.03E+00	1.31E-02	5.10E-03	5.10E-03	1.11E+00	4.59E+00	2.63E-02	1.31E-02	5.10E-03
PCH, SR-103 to I-710	1.42E+02	2.65E-01	2.94E-02	1.20E+00	4.61E-02	1.24E-01	6.46E+00	2.31E-03	4.61E-02	5.19E+00	1.19E-01	4.61E-02	4.61E-02	1.00E+01	4.15E+01	2.37E-01	1.19E-01	4.61E-02
Sepulveda, I-110 to Avalon	5.21E+01	3.17E-01	1.00E-01	1.95E+00	6.07E-03	4.22E-01	8.49E-01	3.03E-04	6.07E-03	1.94E+00	1.56E-02	6.07E-03	6.07E-03	1.32E+00	5.46E+00	3.12E-02	1.56E-02	6.07E-03
Sepulveda, Avalon to Alameda	4.66E+01	2.89E-01	9.17E-02	1.77E+00	5.04E-03	3.87E-01	7.06E-01	2.52E-04	5.04E-03	1.72E+00	1.30E-02	5.04E-03	5.04E-03	1.10E+00	4.54E+00	2.60E-02	1.30E-02	5.04E-03
Sepulveda, Alameda to ICTF	4.01E+01	1.27E-01	2.49E-02	6.62E-01	1.40E-02	1.05E-01	1.97E+00	7.02E-04	1.40E-02	1.79E+00	3.61E-02	1.40E-02	1.40E-02	3.05E+00	1.26E+01	7.23E-02	3.61E-02	1.40E-02
Sepulveda, ICTF to SR-103	2.65E+01	5.86E-02	5.07E-03	2.54E-01	1.13E-02	2.14E-02	1.58E+00	5.66E-04	1.13E-02	1.25E+00	2.91E-02	1.13E-02	1.13E-02	2.46E+00	1.02E+01	5.82E-02	2.91E-02	1.13E-02
Del Amo, I-110 to Wilmington	7.38E+01	4.97E-01	1.63E-01	3.09E+00	4.81E-03	6.87E-01	6.73E-01	2.40E-04	4.81E-03	2.63E+00	1.24E-02	4.81E-03	4.81E-03	1.05E+00	4.33E+00	2.47E-02	1.24E-02	4.81E-03
Del Amo, Wilmington to Alameda	9.89E+01	5.29E-01	1.57E-01	3.17E+00	1.74E-02	6.64E-01	2.43E+00	8.69E-04	1.74E-02	3.87E+00	4.48E-02	1.74E-02	1.74E-02	3.78E+00	1.56E+01	8.95E-02	4.48E-02	1.74E-02
Del Amo, Alameda to I-710	9.55E+01	5.93E-01	1.88E-01	3.64E+00	1.03E-02	7.94E-01	1.44E+00	5.15E-04	1.03E-02	3.53E+00	2.65E-02	1.03E-02	1.03E-02	2.24E+00	9.26E+00	5.30E-02	2.65E-02	1.03E-02
223rd Street, I-110 to Avalon	3.97E+01	2.31E-01	7.68E-02	1.45E+00	1.43E-03	3.24E-01	2.00E-01	7.15E-05	1.43E-03	1.15E+00	3.68E-03	1.43E-03	1.43E-03	3.11E-01	1.29E+00	7.36E-03	3.68E-03	1.43E-03
223rd Street, Avalon to Wilmington	3.26E+01	1.92E-01	6.39E-02	1.20E+00	1.01E-03	2.70E-01	1.42E-01	5.07E-05	1.01E-03	9.39E-01	2.61E-03	1.01E-03	1.01E-03	2.20E-01	9.12E-01	5.22E-03	2.61E-03	1.01E-03
223rd Street, Wilmington to Alameda	6.36E+01	2.44E-01	6.52E-02	1.40E+00	1.37E-02	2.75E-01	1.91E+00	6.83E-04	1.37E-02	2.28E+00	3.52E-02	1.37E-02	1.37E-02	2.97E+00	1.23E+01	7.04E-02	3.52E-02	1.37E-02
W Wardlow from Alameda to I-710	6.99E+01	2.59E-01	6.71E-02	1.47E+00	1.59E-02	2.83E-01	2.23E+00	7.96E-04	1.59E-02	2.53E+00	4.10E-02	1.59E-02	1.59E-02	3.46E+00	1.43E+01	8.19E-02	4.10E-02	1.59E-02

Table B-2
2015 Alternative 1
Annual Average Truck Emissions

	Port - LNG Emissions									Port - LNG Emissions								
	TOG	Acetaldehyde	Benzene	Ethylbenzene	Formaldehyde	n-Hexane	Propylene	Toluene	Xylenes	PM10	Bromine	Chlorine	Chromium (hex)	Copper	Manganese	Nickel	Sulfates	Zinc
		75070	71432	100414	50000	110543	115071	108883	1330207		7726956	7782505	18540299	7440508	7439965	7440020	9960	7440666
Alternative 1, 2015	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to Transition																		
New Dock Ramps - Cerritos Channel (A1 Line)	1.01E+03	3.02E-01	1.11E+00	1.01E-01	8.14E+00	2.01E-01	1.70E+01	4.02E-01	2.01E-01	1.56E+02	7.81E-02	1.09E+01	3.91E-03	7.81E-02	7.81E-02	7.81E-02	7.03E+01	7.81E-02
SB Cerritos Channel - Transition (G1 Line)	2.72E+02	8.17E-02	3.00E-01	2.72E-02	2.21E+00	5.45E-02	4.60E+00	1.09E-01	5.45E-02	4.23E+01	2.12E-02	2.96E+00	1.06E-03	2.12E-02	2.12E-02	2.12E-02	1.90E+01	2.12E-02
NB Cerritos Channel - Transition (E1 Line)	3.14E+02	9.43E-02	3.46E-01	3.14E-02	2.55E+00	6.28E-02	5.31E+00	1.26E-01	6.28E-02	4.88E+01	2.44E-02	3.42E+00	1.22E-03	2.44E-02	2.44E-02	2.44E-02	2.20E+01	2.44E-02
Mainline Transition to HF Ramps & SR-103																		
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	1.50E+02	4.50E-02	1.65E-01	1.50E-02	1.22E+00	3.00E-02	2.54E+00	6.00E-02	3.00E-02	2.33E+01	1.17E-02	1.63E+00	5.83E-04	1.17E-02	1.17E-02	1.17E-02	1.05E+01	1.17E-02
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	1.30E+02	3.91E-02	1.44E-01	1.30E-02	1.06E+00	2.61E-02	2.20E+00	5.22E-02	2.61E-02	2.03E+01	1.01E-02	1.42E+00	5.07E-04	1.01E-02	1.01E-02	1.01E-02	9.12E+00	1.01E-02
Henry Ford Exit and Entrance Ramps	9.38E+01	2.81E-02	1.03E-01	9.38E-03	7.60E-01	1.88E-02	1.59E+00	3.75E-02	1.88E-02	1.46E+01	7.29E-03	1.02E+00	3.64E-04	7.29E-03	7.29E-03	7.29E-03	6.56E+00	7.29E-03
Henry Ford n/o Ramps to Alameda	3.72E+02	1.12E-01	4.09E-01	3.72E-02	3.01E+00	7.44E-02	6.29E+00	1.49E-01	7.44E-02	5.78E+01	2.89E-02	4.05E+00	1.45E-03	2.89E-02	2.89E-02	2.89E-02	2.60E+01	2.89E-02
SR-47 Extension, HF Ramps to Alameda																		
SB, 103 Split to Dominguex Channel (D1 Line)	1.01E+03	3.03E-01	1.11E+00	1.01E-01	8.18E+00	2.02E-01	1.71E+01	4.04E-01	2.02E-01	1.57E+02	7.85E-02	1.10E+01	3.92E-03	7.85E-02	7.85E-02	7.85E-02	7.06E+01	7.85E-02
NB, 103 Split to Dominguex Channel (F1 Line)	9.96E+02	2.99E-01	1.10E+00	9.96E-02	8.06E+00	1.99E-01	1.68E+01	3.98E-01	1.99E-01	1.55E+02	7.74E-02	1.08E+01	3.87E-03	7.74E-02	7.74E-02	7.74E-02	6.96E+01	7.74E-02
Dominguex Channel - Alameda (I1 Line)	2.39E+03	7.18E-01	2.63E+00	2.39E-01	1.94E+01	4.79E-01	4.05E+01	9.58E-01	4.79E-01	3.72E+02	1.86E-01	2.61E+01	9.30E-03	1.86E-01	1.86E-01	1.86E-01	1.67E+02	1.86E-01
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.10E+03	3.31E-01	1.21E+00	1.10E-01	8.93E+00	2.20E-01	1.86E+01	4.41E-01	2.20E-01	1.71E+02	8.57E-02	1.20E+01	4.28E-03	8.57E-02	8.57E-02	8.57E-02	7.71E+01	8.57E-02
SR-103 Anaheim to PCH	6.88E+02	2.06E-01	7.57E-01	6.88E-02	5.57E+00	1.38E-01	1.16E+01	2.75E-01	1.38E-01	1.07E+02	5.35E-02	7.49E+00	2.67E-03	5.35E-02	5.35E-02	5.35E-02	4.81E+01	5.35E-02
SR-103 PCH to Sepulveda/Willow	8.66E+02	2.60E-01	9.53E-01	8.66E-02	7.02E+00	1.73E-01	1.46E+01	3.47E-01	1.73E-01	1.35E+02	6.73E-02	9.42E+00	3.37E-03	6.73E-02	6.73E-02	6.73E-02	6.06E+01	6.73E-02
E and W Harry Bridges, Figueroa to start Alameda	9.02E+02	2.71E-01	9.92E-01	9.02E-02	7.31E+00	1.80E-01	1.52E+01	3.61E-01	1.80E-01	1.40E+02	7.01E-02	9.81E+00	3.50E-03	7.01E-02	7.01E-02	7.01E-02	6.31E+01	7.01E-02
Alameda beginning (E Harry Bridges) to Anaheim	8.16E+02	2.45E-01	8.97E-01	8.16E-02	6.61E+00	1.63E-01	1.38E+01	3.26E-01	1.63E-01	1.27E+02	6.34E-02	8.87E+00	3.17E-03	6.34E-02	6.34E-02	6.34E-02	5.70E+01	6.34E-02
Alameda Anaheim to Henry Ford	2.89E+02	8.67E-02	3.18E-01	2.89E-02	2.34E+00	5.78E-02	4.88E+00	1.16E-01	5.78E-02	4.49E+01	2.24E-02	3.14E+00	1.12E-03	2.24E-02	2.24E-02	2.24E-02	2.02E+01	2.24E-02
Alameda, Henry Ford to PCH	3.62E+02	1.09E-01	3.98E-01	3.62E-02	2.93E+00	7.24E-02	6.12E+00	1.45E-01	7.24E-02	5.63E+01	2.81E-02	3.94E+00	1.41E-03	2.81E-02	2.81E-02	2.81E-02	2.53E+01	2.81E-02
Alameda PCH to 405	8.44E+03	2.53E+00	9.28E+00	8.44E-01	6.83E+01	1.69E+00	1.43E+02	3.37E+00	1.69E+00	1.31E+03	6.56E-01	9.18E+01	3.28E-02	6.56E-01	6.56E-01	6.56E-01	5.90E+02	6.56E-01
Alameda 405 to del Amo	2.41E+03	7.24E-01	2.66E+00	2.41E-01	1.96E+01	4.83E-01	4.08E+01	9.66E-01	4.83E-01	3.75E+02	1.88E-01	2.63E+01	9.38E-03	1.88E-01	1.88E-01	1.88E-01	1.69E+02	1.88E-01
Alameda, del Amo to South Santa Fe Avenue	7.48E+02	2.24E-01	8.23E-01	7.48E-02	6.06E+00	1.50E-01	1.26E+01	2.99E-01	1.50E-01	1.16E+02	5.81E-02	8.14E+00	2.91E-03	5.81E-02	5.81E-02	5.81E-02	5.23E+01	5.81E-02
Alameda, South Santa Fe Avenue to SR-91	9.73E+02	2.92E-01	1.07E+00	9.73E-02	7.88E+00	1.95E-01	1.64E+01	3.89E-01	1.95E-01	1.51E+02	7.56E-02	1.06E+01	3.78E-03	7.56E-02	7.56E-02	7.56E-02	6.80E+01	7.56E-02
I-110, "C" Street Interchange to Anaheim	1.20E+03	3.60E-01	1.32E+00	1.20E-01	9.72E+00	2.40E-01	2.03E+01	4.80E-01	2.40E-01	1.87E+02	9.33E-02	1.31E+01	4.66E-03	9.33E-02	9.33E-02	9.33E-02	8.39E+01	9.33E-02
I-110, Anaheim to PCH	2.02E+03	6.05E-01	2.22E+00	2.02E-01	1.63E+01	4.03E-01	3.41E+01	8.06E-01	4.03E-01	3.13E+02	1.57E-01	2.19E+01	7.83E-03	1.57E-01	1.57E-01	1.57E-01	1.41E+02	1.57E-01
1-110, PCH to Sepulveda	3.68E+03	1.10E+00	4.05E+00	3.68E-01	2.98E+01	7.36E-01	6.22E+01	1.47E+00	7.36E-01	5.72E+02	2.86E-01	4.00E+01	1.43E-02	2.86E-01	2.86E-01	2.86E-01	2.57E+02	2.86E-01
I-110, Sepulveda to Carson	3.87E+03	1.16E+00	4.26E+00	3.87E-01	3.14E+01	7.75E-01	6.55E+01	1.55E+00	7.75E-01	6.02E+02	3.01E-01	4.21E+01	1.51E-02	3.01E-01	3.01E-01	3.01E-01	2.71E+02	3.01E-01
I-110, Carson to Del Amo	2.45E+03	7.34E-01	2.69E+00	2.45E-01	1.98E+01	4.89E-01	4.13E+01	9.78E-01	4.89E-01	3.80E+02	1.90E-01	2.66E+01	9.50E-03	1.90E-01	1.90E-01	1.90E-01	1.71E+02	1.90E-01
I-110, Del Amo to 405	1.47E+03	4.41E-01	1.62E+00	1.47E-01	1.19E+01	2.94E-01	2.48E+01	5.88E-01	2.94E-01	2.28E+02	1.14E-01	1.60E+01	5.71E-03	1.14E-01	1.14E-01	1.14E-01	1.03E+02	1.14E-01
I-110, 405 to SR-91	2.13E+03	6.39E-01	2.34E+00	2.13E-01	1.72E+01	4.26E-01	3.60E+01	8.52E-01	4.26E-01	3.31E+02	1.65E-01	2.32E+01	8.27E-03	1.65E-01	1.65E-01	1.65E-01	1.49E+02	1.65E-01
I-710, Anaheim to PCH	3.79E+03	1.14E+00	4.17E+00	3.79E-01	3.07E+01	7.58E-01	6.40E+01	1.52E+00	7.58E-01	5.89E+02	2.94E-01	4.12E+01	1.47E-02	2.94E-01	2.94E-01	2.94E-01	2.65E+02	2.94E-01
I-710, PCH to Willow	7.73E+03	2.32E+00	8.50E+00	7.73E-01	6.26E+01	1.55E+00	1.31E+02	3.09E+00	1.55E+00	1.20E+03	6.00E-01	8.41E+01	3.00E-02	6.00E-01	6.00E-01	6.00E-01	5.40E+02	6.00E-01
I-710, Willow to 405	1.16E+04	3.49E+00	1.28E+01	1.16E+00	9.43E+01	2.33E+00	1.97E+02	4.66E+00	2.33E+00	1.81E+03	9.05E-01	1.27E+02	4.52E-02	9.05E-01	9.05E-01	9.05E-01	8.14E+02	9.05E-01
I-710, 405 to Del Amo	1.14E+04	3.41E+00	1.25E+01	1.14E+00	9.20E+01	2.27E+00	1.92E+02	4.54E+00	2.27E+00	1.76E+03	8.82E-01	1.24E+02	4.41E-02	8.82E-01	8.82E-01	8.82E-01	7.94E+02	8.82E-01
I-710, Del Amo to Long Beach Blvd Interchange	9.23E+03	2.77E+00	1.02E+01	9.23E-01	7.48E+01	1.85E+00	1.56E+02	3.69E+00	1.85E+00	1.43E+03	7.17E-01	1.00E+02	3.59E-02	7.17E-01	7.17E-01	7.17E-01	6.46E+02	7.17E-01
I-710, Long Beach Boulevard to SR-91	7.50E+03	2.25E+00	8.25E+00	7.50E-01	6.08E+01	1.50E+00	1.27E+02	3.00E+00	1.50E+00	1.17E+03	5.83E-01	8.16E+01	2.91E-02	5.83E-01	5.83E-01	5.83E-01	5.25E+02	5.83E-01
PCH, I110 to Alameda	9.05E+02	2.72E-01	9.96E-01	9.05E-02	7.33E+00	1.81E-01	1.53E+01	3.62E-01	1.81E-01	1.41E+02	7.03E-02	9.85E+00	3.52E-03	7.03E-02	7.03E-02	7.03E-02	6.33E+01	7.03E-02
PCH, Alameda to SR-103	6.57E+01	1.97E-02	7.22E-02	6.57E-03	5.32E-01	1.31E-02	1.11E+00	2.63E-02	1.31E-02	1.02E+01	5.10E-03	7.14E-01	2.55E-04	5.10E-03	5.10E-03	5.10E-03	4.59E+00	5.10E-03
PCH, SR-103 to I-710	5.94E+02	1.78E-01	6.53E-01	5.94E-02	4.81E+00	1.19E-01	1.00E+01	2.37E-01	1.19E-01	9.22E+01	4.61E-02	6.46E+00	2.31E-03	4.61E-02	4.61E-02	4.61E-02	4.15E+01	4.61E-02
Sepulveda, I-110 to Avalon	7.81E+01	2.34E-02	8.59E-02	7.81E-03	6.32E-01	1.56E-02	1.32E+00	3.12E-02	1.56E-02	1.21E+01	6.07E-03	8.49E-01	3.03E-04	6.07E-03	6.07E-03	6.07E-03	5.46E+00	6.07E-03
Sepulveda, Avalon to Alameda	6.49E+01	1.95E-02	7.14E-02	6.49E-03	5.26E-01	1.30E-02	1.10E+00	2.60E-02	1.30E-02	1.01E+01	5.04E-03	7.06E-01	2.52E-04	5.04E-03	5.04E-03	5.04E-03	4.54E+00	5.04E-03
Sepulveda, Alameda to ICTF	1.81E+02	5.42E-02	1.99E-01	1.81E-02	1.46E+00	3.61E-02	3.05E+00	7.23E-02	3.61E-02	2.81E+01	1.40E-02	1.97E+00	7.02E-04	1.40E-02	1.40E-02	1.40E-02	1.26E+01	1.40E-02
Sepulveda, ICTF to SR-103	1.46E+02	4.37E-02	1.60E-01	1.46E-02	1.18E+00	2.91E-02	2.46E+00	5.82E-02	2.91E-02	2.26E+01	1.13E-02	1.58E+00	5.66E-04	1.13E-02	1.13E-02	1.13E-02	1.02E+01	1.13E-02
Del Amo, I-110 to Wilmington	6.19E+01	1.86E-02	6.80E-02	6.19E-03	5.01E-01	1.24E-02	1.05E+00	2.47E-02	1.24E-02	9.61E+00	4.81E-03	6.73E-01	2.40E-04	4.81E-03	4.81E-03	4.81E-03	4.33E+00	4.81E-03
Del Amo, Wilmington to Alameda	2.24E+02	6.71E-02	2.46E-01	2.24E-02	1.81E+00	4.48E-02	3.78E+00	8.95E-02	4.48E-02	3.48E+01	1.74E-02	2.43E+00	8.69E-04	1.74E-02	1.74E-02	1.74E-02	1.56E+01	1.74E-02
Del Amo, Alameda to I-710	1.32E+02	3.97E-02	1.46E-01	1.32E-02	1.07E+00	2.65E-02	2.24E+00	5.30E-02	2.65E-02	2.06E+01	1.03E-02	1.44E+00	5.15E-04	1.03E-02	1.03E-02	1.03E-02	9.26E+00	1.03E-02
223rd Street, I-110 to Avalon	1.84E+01	5.52E-03	2.02E-02	1.84E-03	1.49E-01	3.68E-03	3.11E-01	7.36E-03	3.68E-03	2.86E+00	1.43E-03	2.00E-01	7.15E-05	1.43E-03	1.43E-03	1.43E-03	1.29E+00	1.43E-03
223rd Street, Avalon to Wilmington	1.30E+01	3.91E-03	1.43E-02	1.30E-03	1.06E-01	2.61E-03	2.20E-01	5.22E-03	2.61E-03	2.03E+00	1.01E-03	1.42E-01	5.07E-05	1.01E-03	1.01E-03	1.01E-03	9.12E-01	1.01E-03
223rd Street, Wilmington to Alameda	1.76E+02	5.28E-02	1.93E-01	1.76E-02	1.42E+00	3.52E-02	2.97E+00	7.04E-02	3.52E-02	2.73E+01	1.37E-02	1.91E+00	6.83E-04	1.37E-02	1.37E-02	1.37E-02	1.23E+01	1.37E-02
W Wardlow from Alameda to I-710	2.05E+02	6.14E-02	2.25E-01	2.05E-02	1.66E+00	4.10E-02	3.46E+00	8.19E-02	4.10E-02	3.18E+01	1.59E-02	2.23E+00	7.96E-04	1.59E-02	1.59E-02	1.59E-02	1.43E+01	1.59E-02

Table B-2
2015 Alternative 1
Annual Average Truck Emissions

	SCAG - Gasoline Trucks					
	TOG	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
		71432	50000	106990	75070	107028
Alternative 1, 2015	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to Transition	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
New Dock Ramps - Cerritos Channel (A1 Line)	5.40E+00	1.32E-01	9.24E-02	2.99E-02	2.08E-02	7.08E-03
SB Cerritos Channel - Transition (G1 Line)	1.46E+00	3.56E-02	2.50E-02	8.09E-03	5.63E-03	1.92E-03
NB Cerritos Channel - Transition (E1 Line)	1.69E+00	4.11E-02	2.89E-02	9.34E-03	6.50E-03	2.21E-03
Mainline Transition to HF Ramps & SR-103						
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	8.99E-01	2.19E-02	1.54E-02	4.97E-03	3.46E-03	1.18E-03
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	7.82E-01	1.90E-02	1.34E-02	4.32E-03	3.01E-03	1.02E-03
Henry Ford Exit and Entrance Ramps	1.05E-01	2.56E-03	1.80E-03	5.82E-04	4.05E-04	1.38E-04
Henry Ford n/o Ramps to Alameda	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SR-47 Extension, HF Ramps to Alameda						
SB, 103 Split to Dominguex Channel (D1 Line)	5.47E+00	1.33E-01	9.36E-02	3.03E-02	2.11E-02	7.17E-03
NB, 103 Split to Dominguex Channel (F1 Line)	5.39E+00	1.31E-01	9.22E-02	2.98E-02	2.08E-02	7.07E-03
Dominguex Channel - Alameda (I1 Line)	1.30E+01	3.16E-01	2.22E-01	7.18E-02	5.00E-02	1.70E-02
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	9.73E+00	2.37E-01	1.66E-01	5.38E-02	3.75E-02	1.27E-02
SR-103 Anaheim to PCH	8.48E+00	2.06E-01	1.45E-01	4.69E-02	3.26E-02	1.11E-02
SR-103 PCH to Sepulveda/Willow	2.48E+01	6.05E-01	4.25E-01	1.37E-01	9.56E-02	3.25E-02
E and W Harry Bridges, Figueroa to start Alameda	2.35E+01	5.72E-01	4.02E-01	1.30E-01	9.05E-02	3.08E-02
Alameda beginning (E Harry Bridges) to Anaheim	3.70E+01	9.01E-01	6.33E-01	2.05E-01	1.42E-01	4.85E-02
Alameda Anaheim to Henry Ford	2.01E+01	4.90E-01	3.44E-01	1.11E-01	7.74E-02	2.64E-02
Alameda, Henry Ford to PCH	1.64E+01	4.00E-01	2.81E-01	9.09E-02	6.33E-02	2.15E-02
Alameda PCH to 405	3.09E+02	7.52E+00	5.28E+00	1.71E+00	1.19E+00	4.05E-01
Alameda 405 to del Amo	1.93E+02	4.70E+00	3.30E+00	1.07E+00	7.42E-01	2.53E-01
Alameda, del Amo to South Santa Fe Avenue	5.69E+01	1.39E+00	9.74E-01	3.15E-01	2.19E-01	7.46E-02
Alameda, South Santa Fe Avenue to SR-91	6.60E+01	1.61E+00	1.13E+00	3.65E-01	2.54E-01	8.65E-02
I-110, "C" Street Interchange to Anaheim	9.25E+01	2.25E+00	1.58E+00	5.11E-01	3.56E-01	1.21E-01
I-110, Anaheim to PCH	1.75E+02	4.27E+00	3.00E+00	9.70E-01	6.75E-01	2.30E-01
1-110, PCH to Sepulveda	4.56E+02	1.11E+01	7.79E+00	2.52E+00	1.75E+00	5.97E-01
I-110, Sepulveda to Carson	6.92E+02	1.69E+01	1.18E+01	3.83E+00	2.67E+00	9.07E-01
I-110, Carson to Del Amo	5.21E+02	1.27E+01	8.91E+00	2.88E+00	2.01E+00	6.83E-01
I-110, Del Amo to 405	3.78E+02	9.21E+00	6.47E+00	2.09E+00	1.46E+00	4.95E-01
I-110, 405 to SR-91	8.70E+02	2.12E+01	1.49E+01	4.81E+00	3.35E+00	1.14E+00
I-710, Anaheim to PCH	1.28E+02	3.12E+00	2.19E+00	7.10E-01	4.94E-01	1.68E-01
I-710, PCH to Willow	3.03E+02	7.38E+00	5.19E+00	1.68E+00	1.17E+00	3.97E-01
I-710, Willow to 405	4.67E+02	1.14E+01	7.99E+00	2.58E+00	1.80E+00	6.12E-01
I-710, 405 to Del Amo	6.64E+02	1.62E+01	1.14E+01	3.67E+00	2.56E+00	8.70E-01
I-710, Del Amo to Long Beach Blvd Interchange	6.06E+02	1.48E+01	1.04E+01	3.35E+00	2.33E+00	7.94E-01
I-710, Long Beach Boulevard to SR-91	5.09E+02	1.24E+01	8.71E+00	2.82E+00	1.96E+00	6.67E-01
PCH, I110 to Alameda	1.85E+02	4.49E+00	3.16E+00	1.02E+00	7.11E-01	2.42E-01
PCH, Alameda to SR-103	2.92E+01	7.10E-01	4.99E-01	1.61E-01	1.12E-01	3.82E-02
PCH, SR-103 to I-710	2.25E+01	5.47E-01	3.84E-01	1.24E-01	8.65E-02	2.94E-02
Sepulveda, I-110 to Avalon	7.64E+01	1.86E+00	1.31E+00	4.22E-01	2.94E-01	1.00E-01
Sepulveda, Avalon to Alameda	7.00E+01	1.70E+00	1.20E+00	3.87E-01	2.69E-01	9.17E-02
Sepulveda, Alameda to ICTF	1.90E+01	4.63E-01	3.25E-01	1.05E-01	7.32E-02	2.49E-02
Sepulveda, ICTF to SR-103	3.87E+00	9.42E-02	6.61E-02	2.14E-02	1.49E-02	5.07E-03
Del Amo, I-110 to Wilmington	1.24E+02	3.03E+00	2.12E+00	6.87E-01	4.78E-01	1.63E-01
Del Amo, Wilmington to Alameda	1.20E+02	2.92E+00	2.05E+00	6.64E-01	4.62E-01	1.57E-01
Del Amo, Alameda to I-710	1.44E+02	3.50E+00	2.46E+00	7.94E-01	5.53E-01	1.88E-01
223rd Street, I-110 to Avalon	5.86E+01	1.43E+00	1.00E+00	3.24E-01	2.26E-01	7.68E-02
223rd Street, Avalon to Wilmington	4.87E+01	1.19E+00	8.34E-01	2.70E-01	1.88E-01	6.39E-02
223rd Street, Wilmington to Alameda	4.97E+01	1.21E+00	8.50E-01	2.75E-01	1.91E-01	6.52E-02
W Wardlow from Alameda to I-710	5.12E+01	1.25E+00	8.75E-01	2.83E-01	1.97E-01	6.71E-02

Table B-3
2015 Alternative 2
Annual Average Truck Emissions

	Length	Average Speed	Port AADT Trucks	SCAG AADT Trucks	Port LNG Trucks	Port DSL Trucks	SCAG Gasoline Trucks	SCAG Diesel Trucks
2015, Alternative 2	mile	mph	veh/day	veh/day	veh/day	veh/day	veh/day	veh/day
SR-47 Mainline, New Dock Ramps to HF Ramps	0.65	55	19633	179	7853	11780	94	67
Henry Ford Ramps	0.24	25	2396	6	958	1438	3	2
Henry Ford n/o Ramps to Alameda	0.68	25	2764	8	1106	1658	4	3
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.04	55	17236	173	6894	10342	90	65
SR-103 Anaheim to PCH	0.57	55	18871	369	7548	11323	193	138
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	0.47	55	15755	602	6302	9453	315	225
SR-103 Ramps south of Sepulveda/Willow		55	4196	251	1678	2518	131	94
NB Sepulveda Ramp (G2 Line)	0.36	55	2517.6	150.6	1007	1511	79	56
SB Sepulveda Ramp (F2 Ramp)	0.38	55	1678.4	100.4	671	1007	53	37
SR-103 Existing, End Ramps to Sepulveda/Willow		55			0	0		
SB Sepulveda Ramp Traffic	0.07	55	1678.4	100.4	671	1007	53	37
SB+NB Sepulveda Ramp Traffic	0.11	55	4196	251	1678	2518	131	94
SR-103, Realignment to End (223rd/Wardlow)	1.85	50	11557	353	4623	6934	185	132
E and W Harry Bridges, Figueroa to start Alameda	1.44	35	3157	211	1263	1894	110	79
Alameda beginning (E Harry Bridges) to Anaheim	0.77	35	5779	598	2312	3467	313	223
Alameda Anaheim to Henry Ford	0.42	35	3942	607	1577	2365	317	226
Alameda, Henry Ford to PCH	0.34	35	6707	615	2683	4024	322	229
Alameda PCH to 405	2.27	45	5924	1654	2370	3554	865	617
Alameda 405 to del Amo	1.72	45	7614	1453	3046	4568	760	542
Alameda, del Amo to South Santa Fe Avenue	0.84	45	4672	886	1869	2803	463	330
Alameda, South Santa Fe Avenue to SR-91	1.15	45	4108	748	1643	2465	391	279
I-110, "C" Street Interchange to Anaheim	0.49	65	12874	2681	5150	7724	1402	1000
I-110, Anaheim to PCH	0.80	65	13227	3104	5291	7936	1623	1158
1-110, PCH to Sepulveda	1.39	65	13841	4652	5536	8305	2433	1735
I-110, Sepulveda to Carson	1.56	65	12884	6334	5154	7730	3313	2363
I-110, Carson to Del Amo	1.02	65	12416	7288	4966	7450	3812	2718
I-110, Del Amo to 405	0.74	65	10251	7276	4100	6151	3805	2714
I-110, 405 to SR-91	1.09	65	9982	11444	3993	5989	5985	4269
I-710, Anaheim to PCH	0.50	65	41356	3767	16542	24814	1970	1405
I-710, PCH to Willow	1.01	65	43159	4309	17264	25895	2254	1607
I-710, Willow to 405	1.52	65	42926	4375	17170	25756	2288	1632
I-710, 405 to Del Amo	1.42	65	42186	6634	16874	25312	3470	2474
I-710, Del Amo to Long Beach Blvd Interchange	1.17	65	41734	7322	16694	25040	3829	2731
I-710, Long Beach Boulevard to SR-91	0.96	65	41470	7538	16588	24882	3942	2812
PCH, I-110 to Alameda	2.38	50	1853	1116	741	1112	584	416
PCH, Alameda to SR-103	0.94	50	353	372	141	212	195	139
PCH, SR-103 to I-710	0.98	50	4510	342	1804	2706	179	128
Sepulveda, I-110 to Avalon	1.37	40	290	618	116	174	323	231
Sepulveda, Avalon to Alameda	1.70	40	165	397	66	99	208	148
Sepulveda, Alameda to ICTF	0.67	40	1155	252	462	693	132	94
Sepulveda, ICTF to SR-103	0.17	40	4196	182	1678	2518	95	68
Del Amo, I-110 to Wilmington	2.96	40	110	467	44	66	244	174
Del Amo, Wilmington to Alameda	0.77	40	1518	1707	607	911	893	637
Del Amo, Alameda to I-710	0.87	40	839	1326	336	503	693	495
223rd Street, I-110 to Avalon	1.36	45	90	528	36	54	276	197
223rd Street, Avalon to Wilmington	1.23	45	105	494	42	63	258	184
223rd Street, Wilmington to Alameda	0.79	45	1222	789	489	733	413	294
W Wardlow from Alameda to I-710	1.30	45	1317	505	527	790	264	188

Table B-3
2015 Alternative 2
Annual Average Truck Emissions

	Port	Port	Port	Port	SCAG		Port	Port	Port	SCAG	
	LNG TOG	LNG PM10	LNG DPM	Dsl Exhst PM	Gasoline TOG	Dsl Exhst PM	LNG TOG	LNG PM10	LNG+DSL DPM	Gasoline TOG	Dsl Exhst PM
2015, Alternative 2	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	lb/yr	lb/yr	lb/year	lb/year	lb/year
SR-47 Mainline, New Dock Ramps to HF Ramps	0.590	0.092	0.005	0.092	0.162	0.153	2,425	377	585	8	5
Henry Ford Ramps	0.590	0.092	0.005	0.054	0.403	0.122	109.286	16.983	15.9	0.2	0.1
Henry Ford n/o Ramps to Alameda	0.590	0.092	0.005	0.054	0.403	0.122	357.200	55.509	51.9	0.9	0.2
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	0.590	0.092	0.005	0.092	0.162	0.153	3406.708	529.404	822.4	12.2	8.2
SR-103 Anaheim to PCH	0.590	0.092	0.005	0.092	0.162	0.153	2044.254	317.678	493.5	14.3	9.6
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	0.590	0.092	0.005	0.092	0.162	0.153	1407.283	218.692	339.7	19.2	13.0
SR-103 Ramps south of Sepulveda/Willow											
NB Sepulveda Ramp (G2 Line)	0.590	0.092	0.005	0.092	0.162	0.153	172.248	26.767	41.6	3.7	2.5
SB Sepulveda Ramp (F2 Ramp)	0.590	0.092	0.005	0.092	0.162	0.153	121.212	18.836	29.3	2.6	1.7
SR-103 Existing, End Ramps to Sepulveda/Willow											
SB Sepulveda Ramp Traffic	0.590	0.092	0.005	0.092	0.162	0.153	22.328	3.470	5.4	0.5	0.3
SB+NB Sepulveda Ramp Traffic	0.590	0.092	0.005	0.092	0.162	0.153	87.719	13.632	21.2	1.9	1.3
SR-103, Realignment to End (223rd/Wardlow)	0.590	0.092	0.005	0.080	0.170	0.138	4063.328	631.443	860.1	46.8	27.0
E and W Harry Bridges, Figueroa to start Alameda	0.590	0.092	0.005	0.058	0.252	0.115	866.070	134.588	133.8	32.3	10.5
Alameda beginning (E Harry Bridges) to Anaheim	0.590	0.092	0.005	0.058	0.252	0.115	845.474	131.387	130.6	48.8	15.9
Alameda Anaheim to Henry Ford	0.590	0.092	0.005	0.058	0.252	0.115	316.048	49.114	48.8	27.1	8.9
Alameda, Henry Ford to PCH	0.590	0.092	0.005	0.058	0.252	0.115	437.980	68.062	67.7	22.4	7.3
Alameda PCH to 405	0.590	0.092	0.005	0.070	0.186	0.126	2551.943	396.573	476.0	293.6	142.2
Alameda 405 to del Amo	0.590	0.092	0.005	0.070	0.186	0.126	2490.541	387.031	464.5	195.8	94.9
Alameda, del Amo to South Santa Fe Avenue	0.590	0.092	0.005	0.070	0.186	0.126	746.452	115.999	139.2	58.3	28.3
Alameda, South Santa Fe Avenue to SR-91	0.590	0.092	0.005	0.070	0.186	0.126	900.346	139.914	167.9	67.5	32.7
I-110, "C" Street Interchange to Anaheim	0.590	0.092	0.005	0.122	0.166	0.194	1203.459	187.018	384.1	92.1	76.8
I-110, Anaheim to PCH	0.590	0.092	0.005	0.122	0.166	0.194	2018.845	313.729	644.3	174.2	145.1
1-110, PCH to Sepulveda	0.590	0.092	0.005	0.122	0.166	0.194	3646.464	566.662	1163.7	450.5	375.5
I-110, Sepulveda to Carson	0.590	0.092	0.005	0.122	0.166	0.194	3813.280	592.585	1216.9	689.1	574.3
I-110, Carson to Del Amo	0.590	0.092	0.005	0.122	0.166	0.194	2410.844	374.646	769.4	520.2	433.5
I-110, Del Amo to 405	0.590	0.092	0.005	0.122	0.166	0.194	1443.566	224.331	460.7	376.7	313.9
I-110, 405 to SR-91	0.590	0.092	0.005	0.122	0.166	0.194	2073.312	322.193	661.7	873.8	728.2
I-710, Anaheim to PCH	0.590	0.092	0.005	0.122	0.166	0.194	3925.497	610.024	1252.8	131.4	109.5
I-710, PCH to Willow	0.590	0.092	0.005	0.122	0.166	0.194	8246.450	1281.501	2631.7	302.7	252.2
I-710, Willow to 405	0.590	0.092	0.005	0.122	0.166	0.194	12426.072	1931.016	3965.6	465.6	388.0
I-710, 405 to Del Amo	0.590	0.092	0.005	0.122	0.166	0.194	11380.679	1768.562	3632.0	657.9	548.3
I-710, Del Amo to Long Beach Blvd Interchange	0.590	0.092	0.005	0.122	0.166	0.194	9312.040	1447.094	2971.8	600.6	500.5
I-710, Long Beach Boulevard to SR-91	0.590	0.092	0.005	0.122	0.166	0.194	7573.542	1176.931	2417.0	506.1	421.8
PCH, I-110 to Alameda	0.590	0.092	0.005	0.080	0.170	0.138	837.774	130.190	177.3	190.4	109.8
PCH, Alameda to SR-103	0.590	0.092	0.005	0.080	0.170	0.138	63.164	9.816	13.4	25.1	14.5
PCH, SR-103 to I-710	0.590	0.092	0.005	0.080	0.170	0.138	841.329	130.743	178.1	24.1	13.9
Sepulveda, I-110 to Avalon	0.590	0.092	0.005	0.063	0.213	0.119	75.455	11.726	12.7	75.7	30.2
Sepulveda, Avalon to Alameda	0.590	0.092	0.005	0.063	0.213	0.119	53.274	8.279	9.0	60.4	24.1
Sepulveda, Alameda to ICTF	0.590	0.092	0.005	0.063	0.213	0.119	148.042	23.006	24.9	15.2	6.1
Sepulveda, ICTF to SR-103	0.590	0.092	0.005	0.063	0.213	0.119	136.674	21.239	23.0	2.8	1.1
Del Amo, I-110 to Wilmington	0.590	0.092	0.005	0.063	0.213	0.119	61.856	9.613	10.4	123.7	49.3
Del Amo, Wilmington to Alameda	0.590	0.092	0.005	0.063	0.213	0.119	220.855	34.321	37.2	117.0	46.7
Del Amo, Alameda to I-710	0.590	0.092	0.005	0.063	0.213	0.119	139.062	21.610	23.4	103.5	41.3
223rd Street, I-110 to Avalon	0.590	0.092	0.005	0.070	0.186	0.126	23.315	3.623	4.3	56.4	27.3
223rd Street, Avalon to Wilmington	0.590	0.092	0.005	0.070	0.186	0.126	24.454	3.800	4.6	47.4	23.0
223rd Street, Wilmington to Alameda	0.590	0.092	0.005	0.070	0.186	0.126	183.248	28.477	34.2	48.7	23.6
W Wardlow from Alameda to I-710	0.590	0.092	0.005	0.070	0.186	0.126	325.345	50.559	60.7	51.4	24.9

Table B-3
2015 Alternative 2
Annual Average Truck Emissions

	Total Average Annual Toxic Emissions from Trucks																	
	DPM	Acet-aldehyde	Acrolein	Benzene	Bromine	1,3-Butadiene	Chlorine	Chromium	Copper	Form-aldehyde	n-Hexane	Manganese	Nickel	Propylene	Sulfates	Toluene	Xylenes	Zinc
	9901	75070	107028	71432	7726956	106990	7782505	18540299	7440508	50000	110543	7439965	7440020	115071	9960	108883	1330207	7440666
2015, Alternative 2	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to HF Ramps	5.91E+02	7.58E-01	1.04E-02	2.86E+00	1.88E-01	4.38E-02	2.64E+01	9.42E-03	1.88E-01	1.98E+01	4.85E-01	1.88E-01	1.88E-01	4.10E+01	1.70E+02	9.70E-01	4.85E-01	1.88E-01
Henry Ford Ramps	1.59E+01	3.37E-02	3.20E-04	1.26E-01	8.49E-03	1.35E-03	1.19E+00	4.25E-04	8.49E-03	8.89E-01	2.19E-02	8.49E-03	8.49E-03	1.85E+00	7.64E+00	4.37E-02	2.19E-02	8.49E-03
Henry Ford n/o Ramps to Alameda	5.21E+01	1.11E-01	1.21E-03	4.15E-01	2.78E-02	5.11E-03	3.89E+00	1.39E-03	2.78E-02	2.91E+00	7.14E-02	2.78E-02	2.78E-02	6.04E+00	2.50E+01	1.43E-01	7.14E-02	2.78E-02
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	8.31E+02	1.07E+00	1.60E-02	4.05E+00	2.65E-01	6.77E-02	3.71E+01	1.32E-02	2.65E-01	2.78E+01	6.81E-01	2.65E-01	2.65E-01	5.76E+01	2.38E+02	1.36E+00	6.81E-01	2.65E-01
SR-103 Anaheim to PCH	5.03E+02	6.68E-01	1.87E-02	2.60E+00	1.59E-01	7.91E-02	2.22E+01	7.94E-03	1.59E-01	1.68E+01	4.09E-01	1.59E-01	1.59E-01	3.45E+01	1.43E+02	8.18E-01	4.09E-01	1.59E-01
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	3.53E+02	4.96E-01	2.52E-02	2.02E+00	1.09E-01	1.06E-01	1.53E+01	5.47E-03	1.09E-01	1.17E+01	2.81E-01	1.09E-01	1.09E-01	2.38E+01	9.84E+01	5.63E-01	2.81E-01	1.09E-01
SR-103 Ramps south of Sepulveda/Willow																		
NB Sepulveda Ramp (G2 Line)	4.41E+01	6.59E-02	4.83E-03	2.79E-01	1.34E-02	2.04E-02	1.87E+00	6.69E-04	1.34E-02	1.46E+00	3.44E-02	1.34E-02	1.34E-02	2.91E+00	1.20E+01	6.89E-02	3.44E-02	1.34E-02
SB Sepulveda Ramp (F2 Ramp)	3.10E+01	4.64E-02	3.40E-03	1.97E-01	9.42E-03	1.43E-02	1.32E+00	4.71E-04	9.42E-03	1.03E+00	2.42E-02	9.42E-03	9.42E-03	2.05E+00	8.48E+00	4.85E-02	2.42E-02	9.42E-03
SR-103 Existing, End Ramps to Sepulveda/Willow																		
SB Sepulveda Ramp Traffic	5.71E+00	8.54E-03	6.26E-04	3.62E-02	1.73E-03	2.64E-03	2.43E-01	8.67E-05	1.73E-03	1.89E-01	4.47E-03	1.73E-03	1.73E-03	3.77E-01	1.56E+00	8.93E-03	4.47E-03	1.73E-03
SB+NB Sepulveda Ramp Traffic	2.24E+01	3.35E-02	2.46E-03	1.42E-01	6.82E-03	1.04E-02	9.54E-01	3.41E-04	6.82E-03	7.43E-01	1.75E-02	6.82E-03	6.82E-03	1.48E+00	6.13E+00	3.51E-02	1.75E-02	6.82E-03
SR-103, Realignment to End (223rd/Wardlow)	8.87E+02	1.40E+00	6.14E-02	5.61E+00	3.16E-01	2.59E-01	4.42E+01	1.58E-02	3.16E-01	3.37E+01	8.13E-01	3.16E-01	3.16E-01	6.87E+01	2.84E+02	1.63E+00	8.13E-01	3.16E-01
E and W Harry Bridges, Figueroa to start Alameda	1.44E+02	3.84E-01	4.23E-02	1.74E+00	6.73E-02	1.79E-01	9.42E+00	3.36E-03	6.73E-02	7.57E+00	1.73E-01	6.73E-02	6.73E-02	1.46E+01	6.06E+01	3.46E-01	1.73E-01	6.73E-02
Alameda beginning (E Harry Bridges) to Anaheim	1.47E+02	4.41E-01	6.39E-02	2.12E+00	6.57E-02	2.70E-01	9.20E+00	3.28E-03	6.57E-02	7.68E+00	1.69E-01	6.57E-02	6.57E-02	1.43E+01	5.91E+01	3.38E-01	1.69E-01	6.57E-02
Alameda Anaheim to Henry Ford	5.77E+01	1.99E-01	3.56E-02	1.01E+00	2.46E-02	1.50E-01	3.44E+00	1.23E-03	2.46E-02	3.02E+00	6.32E-02	2.46E-02	2.46E-02	5.34E+00	2.21E+01	1.26E-01	6.32E-02	2.46E-02
Alameda, Henry Ford to PCH	7.50E+01	2.18E-01	2.93E-02	1.03E+00	3.40E-02	1.24E-01	4.76E+00	1.70E-03	3.40E-02	3.93E+00	8.76E-02	3.40E-02	3.40E-02	7.40E+00	3.06E+01	1.75E-01	8.76E-02	3.40E-02
Alameda PCH to 405	6.18E+02	1.90E+00	3.85E-01	9.95E+00	1.98E-01	1.62E+00	2.78E+01	9.91E-03	1.98E-01	2.57E+01	5.10E-01	1.98E-01	1.98E-01	4.31E+01	1.78E+02	1.02E+00	5.10E-01	1.98E-01
Alameda 405 to del Amo	5.59E+02	1.50E+00	2.57E-01	7.51E+00	1.94E-01	1.08E+00	2.71E+01	9.68E-03	1.94E-01	2.35E+01	4.98E-01	1.94E-01	1.94E-01	4.21E+01	1.74E+02	9.96E-01	4.98E-01	1.94E-01
Alameda, del Amo to South Santa Fe Avenue	1.67E+02	4.48E-01	7.64E-02	2.24E+00	5.80E-02	3.23E-01	8.12E+00	2.90E-03	5.80E-02	7.04E+00	1.49E-01	5.80E-02	5.80E-02	1.26E+01	5.22E+01	2.99E-01	1.49E-01	5.80E-02
Alameda, South Santa Fe Avenue to SR-91	2.01E+02	5.30E-01	8.85E-02	2.63E+00	7.00E-02	3.74E-01	9.79E+00	3.50E-03	7.00E-02	8.45E+00	1.80E-01	7.00E-02	7.00E-02	1.52E+01	6.30E+01	3.60E-01	1.80E-01	7.00E-02
I-110, "C" Street Interchange to Anaheim	4.61E+02	7.16E-01	1.21E-01	3.57E+00	9.35E-02	5.09E-01	1.31E+01	4.68E-03	9.35E-02	1.13E+01	2.41E-01	9.35E-02	9.35E-02	2.03E+01	8.42E+01	4.81E-01	2.41E-01	9.35E-02
I-110, Anaheim to PCH	7.89E+02	1.28E+00	2.28E-01	6.46E+00	1.57E-01	9.63E-01	2.20E+01	7.84E-03	1.57E-01	1.93E+01	4.04E-01	1.57E-01	1.57E-01	3.41E+01	1.41E+02	8.08E-01	4.04E-01	1.57E-01
1-110, PCH to Sepulveda	1.54E+03	2.83E+00	5.90E-01	1.50E+01	2.83E-01	2.49E+00	3.97E+01	1.42E-02	2.83E-01	3.72E+01	7.29E-01	2.83E-01	2.83E-01	6.16E+01	2.55E+02	1.46E+00	7.29E-01	2.83E-01
I-110, Sepulveda to Carson	1.79E+03	3.80E+00	9.03E-01	2.10E+01	2.96E-01	3.81E+00	4.15E+01	1.48E-02	2.96E-01	4.27E+01	7.63E-01	2.96E-01	2.96E-01	6.44E+01	2.67E+02	1.53E+00	7.63E-01	2.96E-01
I-110, Carson to Del Amo	1.20E+03	2.73E+00	6.81E-01	1.53E+01	1.87E-01	2.88E+00	2.62E+01	9.37E-03	1.87E-01	2.84E+01	4.82E-01	1.87E-01	1.87E-01	4.07E+01	1.69E+02	9.64E-01	4.82E-01	1.87E-01
I-110, Del Amo to 405	7.75E+02	1.88E+00	4.93E-01	1.08E+01	1.12E-01	2.08E+00	1.57E+01	5.61E-03	1.12E-01	1.81E+01	2.89E-01	1.12E-01	1.12E-01	2.44E+01	1.01E+02	5.77E-01	2.89E-01	1.12E-01
I-110, 405 to SR-91	1.39E+03	3.99E+00	1.14E+00	2.36E+01	1.61E-01	4.83E+00	2.26E+01	8.05E-03	1.61E-01	3.17E+01	4.15E-01	1.61E-01	1.61E-01	3.50E+01	1.45E+02	8.29E-01	4.15E-01	1.61E-01
I-710, Anaheim to PCH	1.36E+03	1.68E+00	1.72E-01	7.52E+00	3.05E-01	7.27E-01	4.27E+01	1.53E-02	3.05E-01	3.40E+01	7.85E-01	3.05E-01	3.05E-01	6.63E+01	2.75E+02	1.57E+00	7.85E-01	3.05E-01
I-710, PCH to Willow	2.88E+03	3.64E+00	3.96E-01	1.64E+01	6.41E-01	1.67E+00	8.97E+01	3.20E-02	6.41E-01	7.20E+01	1.65E+00	6.41E-01	6.41E-01	1.39E+02	5.77E+02	3.30E+00	1.65E+00	6.41E-01
I-710, Willow to 405	4.35E+03	5.52E+00	6.10E-01	2.50E+01	9.66E-01	2.57E+00	1.35E+02	4.83E-02	9.66E-01	1.09E+02	2.49E+00	9.66E-01	9.66E-01	2.10E+02	8.69E+02	4.97E+00	2.49E+00	9.66E-01
I-710, 405 to Del Amo	4.18E+03	5.95E+00	8.62E-01	2.85E+01	8.84E-01	3.64E+00	1.24E+02	4.42E-02	8.84E-01	1.03E+02	2.28E+00	8.84E-01	8.84E-01	1.92E+02	7.96E+02	4.55E+00	2.28E+00	8.84E-01
I-710, Del Amo to Long Beach Blvd Interchange	3.47E+03	5.11E+00	7.87E-01	2.49E+01	7.24E-01	3.32E+00	1.01E+02	3.62E-02	7.24E-01	8.57E+01	1.86E+00	7.24E-01	7.24E-01	1.57E+02	6.51E+02	3.72E+00	1.86E+00	7.24E-01
I-710, Long Beach Boulevard to SR-91	2.84E+03	4.22E+00	6.63E-01	2.07E+01	5.88E-01	2.80E+00	8.24E+01	2.94E-02	5.88E-01	7.00E+01	1.51E+00	5.88E-01	5.88E-01	1.28E+02	5.30E+02	3.03E+00	1.51E+00	5.88E-01
PCH, I-110 to Alameda	2.87E+02	9.84E-01	2.49E-01	5.56E+00	6.51E-02	1.05E+00	9.11E+00	3.25E-03	6.51E-02	1.00E+01	1.68E-01	6.51E-02	6.51E-02	1.42E+01	5.86E+01	3.35E-01	1.68E-01	6.51E-02
PCH, Alameda to SR-103	2.79E+01	1.16E-01	3.29E-02	6.81E-01	4.91E-03	1.39E-01	6.87E-01	2.45E-04	4.91E-03	9.41E-01	1.26E-02	4.91E-03	4.91E-03	1.07E+00	4.42E+00	2.53E-02	1.26E-02	4.91E-03
PCH, SR-103 to I-710	1.92E+02	3.45E-01	3.15E-02	1.51E+00	6.54E-02	1.33E-01	9.15E+00	3.27E-03	6.54E-02	7.23E+00	1.68E-01	6.54E-02	6.54E-02	1.42E+01	5.88E+01	3.37E-01	1.68E-01	6.54E-02
Sepulveda, I-110 to Avalon	4.29E+01	3.14E-01	9.92E-02	1.93E+00	5.86E-03	4.19E-01	8.21E-01	2.93E-04	5.86E-03	1.91E+00	1.51E-02	5.86E-03	5.86E-03	1.28E+00	5.28E+00	3.02E-02	1.51E-02	5.86E-03
Sepulveda, Avalon to Alameda	3.30E+01	2.48E-01	7.91E-02	1.53E+00	4.14E-03	3.34E-01	5.80E-01	2.07E-04	4.14E-03	1.46E+00	1.07E-02	4.14E-03	4.14E-03	9.00E-01	3.73E+00	2.13E-02	1.07E-02	4.14E-03
Sepulveda, Alameda to ICTF	3.10E+01	1.03E-01	1.99E-02	5.33E-01	1.15E-02	8.41E-02	1.61E+00	5.75E-04	1.15E-02	1.46E+00	2.96E-02	1.15E-02	1.15E-02	2.50E+00	1.04E+01	5.92E-02	2.96E-02	1.15E-02
Sepulveda, ICTF to SR-103	2.41E+01	5.18E-02	3.66E-03	2.18E-01	1.06E-02	1.54E-02	1.49E+00	5.31E-04	1.06E-02	1.15E+00	2.73E-02	1.06E-02	1.06E-02	2.31E+00	9.56E+00	5.47E-02	2.73E-02	1.06E-02
Del Amo, I-110 to Wilmington	5.98E+01	4.95E-01	1.62E-01	3.08E+00	4.81E-03	6.84E-01	6.73E-01	2.40E-04	4.81E-03	2.62E+00	1.24E-02	4.81E-03	4.81E-03	1.05E+00	4.33E+00	2.47E-02	1.24E-02	4.81E-03
Del Amo, Wilmington to Alameda	8.38E+01	5.17E-01	1.53E-01	3.09E+00	1.72E-02	6.47E-01	2.40E+00	8.58E-04	1.72E-02	3.79E+00	4.42E-02	1.72E-02	1.72E-02	3.73E+00	1.54E+01	8.83E-02	4.42E-02	1.72E-02
Del Amo, Alameda to I-710	6.47E+01	4.40E-01	1.36E-01	2.67E+00	1.08E-02	5.73E-01	1.51E+00	5.40E-04	1.08E-02	2.90E+00	2.78E-02	1.08E-02	1.08E-02	2.35E+00	9.72E+00	5.56E-02	2.78E-02	1.08E-02
223rd Street, I-110 to Avalon	3.17E+01	2.24E-01	7.38E-02	1.40E+00	1.81E-03	3.12E-01	2.54E-01	9.06E-05	1.81E-03	1.15E+00	4.66E-03	1.81E-03	1.81E-03	3.94E-01	1.63E+00	9.33E-03	4.66E-03	1.81E-03
223rd Street, Avalon to Wilmington	2.75E+01	1.90E-01	6.21E-02	1.18E+00	1.90E-03	2.62E-01	2.66E-01	9.50E-05	1.90E-03	1.01E+00	4.89E-03	1.90E-03	1.90E-03	4.13E-01	1.71E+00	9.78E-03	4.89E-03	1.90E-03
223rd Street, Wilmington to Alameda	5.78E+01	2.43E-01	6.39E-02	1.39E+00	1.42E-02	2.70E-01	1.99E+00	7.12E-04	1.42E-02	2.32E+00	3.66E-02	1.42E-02	1.42E-02	3.10E+00	1.28E+01	7.33E-02	3.66E-02	1.42E-02
W Wardlow from Alameda to I-710	8.56E+01	2.95E-01	6.73E-02	1.61E+00	2.53E-02	2.84E-01	3.54E+00	1.26E-03	2.53E-02	3.51E+00	6.51E-02	2.53E-02	2.53E-02	5.50E+00	2.28E+01	1.30E-01	6.51E-02	2.53E-02

Table B-3
2015 Alternative 2
Annual Average Truck Emissions

	Port - LNG Emissions									Port - LNG Emissions							
	TOG	Acetaldehyde	Benzene	Ethylbenzene	Formaldehyde	n-Hexane	Propylene	Toluene	Xylenes	PM10	Bromine	Chlorine	Chromium (hex)	Copper	Manganese	Nickel	Sulfates
		75070	71432	100414	50000	110543	115071	108883	1330207		7726956	7782505	18540299	7440508	7439965	7440020	9960
2015, Alternative 2	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to HF Ramps	2.43E+03	7.28E-01	2.67E+00	2.43E-01	1.96E+01	4.85E-01	4.10E+01	9.70E-01	4.85E-01	3.77E+02	1.88E-01	2.64E+01	9.42E-03	1.88E-01	1.88E-01	1.88E-01	1.70E+02
Henry Ford Ramps	1.09E+02	3.28E-02	1.20E-01	1.09E-02	8.85E-01	2.19E-02	1.85E+00	4.37E-02	2.19E-02	1.70E+01	8.49E-03	1.19E+00	4.25E-04	8.49E-03	8.49E-03	8.49E-03	7.64E+00
Henry Ford n/o Ramps to Alameda	3.57E+02	1.07E-01	3.93E-01	3.57E-02	2.89E+00	7.14E-02	6.04E+00	1.43E-01	7.14E-02	5.55E+01	2.78E-02	3.89E+00	1.39E-03	2.78E-02	2.78E-02	2.78E-02	2.50E+01
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	3.41E+03	1.02E+00	3.75E+00	3.41E-01	2.76E+01	6.81E-01	5.76E+01	1.36E+00	6.81E-01	5.29E+02	2.65E-01	3.71E+01	1.32E-02	2.65E-01	2.65E-01	2.65E-01	2.38E+02
SR-103 Anaheim to PCH	2.04E+03	6.13E-01	2.25E+00	2.04E-01	1.66E+01	4.09E-01	3.45E+01	8.18E-01	4.09E-01	3.18E+02	1.59E-01	2.22E+01	7.94E-03	1.59E-01	1.59E-01	1.59E-01	1.43E+02
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	1.41E+03	4.22E-01	1.55E+00	1.41E-01	1.14E+01	2.81E-01	2.38E+01	5.63E-01	2.81E-01	2.19E+02	1.09E-01	1.53E+01	5.47E-03	1.09E-01	1.09E-01	1.09E-01	9.84E+01
SR-103 Ramps south of Sepulveda/Willow				0.00E+00													
NB Sepulveda Ramp (G2 Line)	1.72E+02	5.17E-02	1.89E-01	1.72E-02	1.40E+00	3.44E-02	2.91E+00	6.89E-02	3.44E-02	2.68E+01	1.34E-02	1.87E+00	6.69E-04	1.34E-02	1.34E-02	1.34E-02	1.20E+01
SB Sepulveda Ramp (F2 Ramp)	1.21E+02	3.64E-02	1.33E-01	1.21E-02	9.82E-01	2.42E-02	2.05E+00	4.85E-02	2.42E-02	1.88E+01	9.42E-03	1.32E+00	4.71E-04	9.42E-03	9.42E-03	9.42E-03	8.48E+00
SR-103 Existing, End Ramps to Sepulveda/Willow				0.00E+00													
SB Sepulveda Ramp Traffic	2.23E+01	6.70E-03	2.46E-02	2.23E-03	1.81E-01	4.47E-03	3.77E-01	8.93E-03	4.47E-03	3.47E+00	1.73E-03	2.43E-01	8.67E-05	1.73E-03	1.73E-03	1.73E-03	1.56E+00
SB+NB Sepulveda Ramp Traffic	8.77E+01	2.63E-02	9.65E-02	8.77E-03	7.11E-01	1.75E-02	1.48E+00	3.51E-02	1.75E-02	1.36E+01	6.82E-03	9.54E-01	3.41E-04	6.82E-03	6.82E-03	6.82E-03	6.13E+00
SR-103, Realignment to End (223rd/Wardlow)	4.06E+03	1.22E+00	4.47E+00	4.06E-01	3.29E+01	8.13E-01	6.87E+01	1.63E+00	8.13E-01	6.31E+02	3.16E-01	4.42E+01	1.58E-02	3.16E-01	3.16E-01	3.16E-01	2.84E+02
E and W Harry Bridges, Figueroa to start Alameda	8.66E+02	2.60E-01	9.53E-01	8.66E-02	7.02E+00	1.73E-01	1.46E+01	3.46E-01	1.73E-01	1.35E+02	6.73E-02	9.42E+00	3.36E-03	6.73E-02	6.73E-02	6.73E-02	6.06E+01
Alameda beginning (E Harry Bridges) to Anaheim	8.45E+02	2.54E-01	9.30E-01	8.45E-02	6.85E+00	1.69E-01	1.43E+01	3.38E-01	1.69E-01	1.31E+02	6.57E-02	9.20E+00	3.28E-03	6.57E-02	6.57E-02	6.57E-02	5.91E+01
Alameda Anaheim to Henry Ford	3.16E+02	9.48E-02	3.48E-01	3.16E-02	2.56E+00	6.32E-02	5.34E+00	1.26E-01	6.32E-02	4.91E+01	2.46E-02	3.44E+00	1.23E-03	2.46E-02	2.46E-02	2.46E-02	2.21E+01
Alameda, Henry Ford to PCH	4.38E+02	1.31E-01	4.82E-01	4.38E-02	3.55E+00	8.76E-02	7.40E+00	1.75E-01	8.76E-02	6.81E+01	3.40E-02	4.76E+00	1.70E-03	3.40E-02	3.40E-02	3.40E-02	3.06E+01
Alameda PCH to 405	2.55E+03	7.66E-01	2.81E+00	2.55E-01	2.07E+01	5.10E-01	4.31E+01	1.02E+00	5.10E-01	3.97E+02	1.98E-01	2.78E+01	9.91E-03	1.98E-01	1.98E-01	1.98E-01	1.78E+02
Alameda 405 to del Amo	2.49E+03	7.47E-01	2.74E+00	2.49E-01	2.02E+01	4.98E-01	4.21E+01	9.96E-01	4.98E-01	3.87E+02	1.94E-01	2.71E+01	9.68E-03	1.94E-01	1.94E-01	1.94E-01	1.74E+02
Alameda, del Amo to South Santa Fe Avenue	7.46E+02	2.24E-01	8.21E-01	7.46E-02	6.05E+00	1.49E-01	1.26E+01	2.99E-01	1.49E-01	1.16E+02	5.80E-02	8.12E+00	2.90E-03	5.80E-02	5.80E-02	5.80E-02	5.22E+01
Alameda, South Santa Fe Avenue to SR-91	9.00E+02	2.70E-01	9.90E-01	9.00E-02	7.29E+00	1.80E-01	1.52E+01	3.60E-01	1.80E-01	1.40E+02	7.00E-02	9.79E+00	3.50E-03	7.00E-02	7.00E-02	7.00E-02	6.30E+01
I-110, "C" Street Interchange to Anaheim	1.20E+03	3.61E-01	1.32E+00	1.20E-01	9.75E+00	2.41E-01	2.03E+01	4.81E-01	2.41E-01	1.87E+02	9.35E-02	1.31E+01	4.68E-03	9.35E-02	9.35E-02	9.35E-02	8.42E+01
I-110, Anaheim to PCH	2.02E+03	6.06E-01	2.22E+00	2.02E-01	1.64E+01	4.04E-01	3.41E+01	8.08E-01	4.04E-01	3.14E+02	1.57E-01	2.20E+01	7.84E-03	1.57E-01	1.57E-01	1.57E-01	1.41E+02
1-110, PCH to Sepulveda	3.65E+03	1.09E+00	4.01E+00	3.65E-01	2.95E+01	7.29E-01	6.16E+01	1.46E+00	7.29E-01	5.67E+02	2.83E-01	3.97E+01	1.42E-02	2.83E-01	2.83E-01	2.83E-01	2.55E+02
I-110, Sepulveda to Carson	3.81E+03	1.14E+00	4.19E+00	3.81E-01	3.09E+01	7.63E-01	6.44E+01	1.53E+00	7.63E-01	5.93E+02	2.96E-01	4.15E+01	1.48E-02	2.96E-01	2.96E-01	2.96E-01	2.67E+02
I-110, Carson to Del Amo	2.41E+03	7.23E-01	2.65E+00	2.41E-01	1.95E+01	4.82E-01	4.07E+01	9.64E-01	4.82E-01	3.75E+02	1.87E-01	2.62E+01	9.37E-03	1.87E-01	1.87E-01	1.87E-01	1.69E+02
I-110, Del Amo to 405	1.44E+03	4.33E-01	1.59E+00	1.44E-01	1.17E+01	2.89E-01	2.44E+01	5.77E-01	2.89E-01	2.24E+02	1.12E-01	1.57E+01	5.61E-03	1.12E-01	1.12E-01	1.12E-01	1.01E+02
I-110, 405 to SR-91	2.07E+03	6.22E-01	2.28E+00	2.07E-01	1.68E+01	4.15E-01	3.50E+01	8.29E-01	4.15E-01	3.22E+02	1.61E-01	2.26E+01	8.05E-03	1.61E-01	1.61E-01	1.61E-01	1.45E+02
I-710, Anaheim to PCH	3.93E+03	1.18E+00	4.32E+00	3.93E-01	3.18E+01	7.85E-01	6.63E+01	1.57E+00	7.85E-01	6.10E+02	3.05E-01	4.27E+01	1.53E-02	3.05E-01	3.05E-01	3.05E-01	2.75E+02
I-710, PCH to Willow	8.25E+03	2.47E+00	9.07E+00	8.25E-01	6.68E+01	1.65E+00	1.39E+02	3.30E+00	1.65E+00	1.28E+03	6.41E-01	8.97E+01	3.20E-02	6.41E-01	6.41E-01	6.41E-01	5.77E+02
I-710, Willow to 405	1.24E+04	3.73E+00	1.37E+01	1.24E+00	1.01E+02	2.49E+00	2.10E+02	4.97E+00	2.49E+00	1.93E+03	9.66E-01	1.35E+02	4.83E-02	9.66E-01	9.66E-01	9.66E-01	8.69E+02
I-710, 405 to Del Amo	1.14E+04	3.41E+00	1.25E+01	1.14E+00	9.22E+01	2.28E+00	1.92E+02	4.55E+00	2.28E+00	1.77E+03	8.84E-01	1.24E+02	4.42E-02	8.84E-01	8.84E-01	8.84E-01	7.96E+02
I-710, Del Amo to Long Beach Blvd Interchange	9.31E+03	2.79E+00	1.02E+01	9.31E-01	7.54E+01	1.86E+00	1.57E+02	3.72E+00	1.86E+00	1.45E+03	7.24E-01	1.01E+02	3.62E-02	7.24E-01	7.24E-01	7.24E-01	6.51E+02
I-710, Long Beach Boulevard to SR-91	7.57E+03	2.27E+00	8.33E+00	7.57E-01	6.13E+01	1.51E+00	1.28E+02	3.03E+00	1.51E+00	1.18E+03	5.88E-01	8.24E+01	2.94E-02	5.88E-01	5.88E-01	5.88E-01	5.30E+02
PCH, I-110 to Alameda	8.38E+02	2.51E-01	9.22E-01	8.38E-02	6.79E+00	1.68E-01	1.42E+01	3.35E-01	1.68E-01	1.30E+02	6.51E-02	9.11E+00	3.25E-03	6.51E-02	6.51E-02	6.51E-02	5.86E+01
PCH, Alameda to SR-103	6.32E+01	1.89E-02	6.95E-02	6.32E-03	5.12E-01	1.26E-02	1.07E+00	2.53E-02	1.26E-02	9.82E+00	4.91E-03	6.87E-01	2.45E-04	4.91E-03	4.91E-03	4.91E-03	4.42E+00
PCH, SR-103 to I-710	8.41E+02	2.52E-01	9.25E-01	8.41E-02	6.81E+00	1.68E-01	1.42E+01	3.37E-01	1.68E-01	1.31E+02	6.54E-02	9.15E+00	3.27E-03	6.54E-02	6.54E-02	6.54E-02	5.88E+01
Sepulveda, I-110 to Avalon	7.55E+01	2.26E-02	8.30E-02	7.55E-03	6.11E-01	1.51E-02	1.28E+00	3.02E-02	1.51E-02	1.17E+01	5.86E-03	8.21E-01	2.93E-04	5.86E-03	5.86E-03	5.86E-03	5.28E+00
Sepulveda, Avalon to Alameda	5.33E+01	1.60E-02	5.86E-02	5.33E-03	4.32E-01	1.07E-02	9.00E-01	2.13E-02	1.07E-02	8.28E+00	4.14E-03	5.80E-01	2.07E-04	4.14E-03	4.14E-03	4.14E-03	3.73E+00
Sepulveda, Alameda to ICTF	1.48E+02	4.44E-02	1.63E-01	1.48E-02	1.20E+00	2.96E-02	2.50E+00	5.92E-02	2.96E-02	2.30E+01	1.15E-02	1.61E+00	5.75E-04	1.15E-02	1.15E-02	1.15E-02	1.04E+01
Sepulveda, ICTF to SR-103	1.37E+02	4.10E-02	1.50E-01	1.37E-02	1.11E+00	2.73E-02	2.31E+00	5.47E-02	2.73E-02	2.12E+01	1.06E-02	1.49E+00	5.31E-04	1.06E-02	1.06E-02	1.06E-02	9.56E+00
Del Amo, I-110 to Wilmington	6.19E+01	1.86E-02	6.80E-02	6.19E-03	5.01E-01	1.24E-02	1.05E+00	2.47E-02	1.24E-02	9.61E+00	4.81E-03	6.73E-01	2.40E-04	4.81E-03	4.81E-03	4.81E-03	4.33E+00
Del Amo, Wilmington to Alameda	2.21E+02	6.63E-02	2.43E-01	2.21E-02	1.79E+00	4.42E-02	3.73E+00	8.83E-02	4.42E-02	3.43E+01	1.72E-02	2.40E+00	8.58E-04	1.72E-02	1.72E-02	1.72E-02	1.54E+01
Del Amo, Alameda to I-710	1.39E+02	4.17E-02	1.53E-01	1.39E-02	1.13E+00	2.78E-02	2.35E+00	5.56E-02	2.78E-02	2.16E+01	1.08E-02	1.51E+00	5.40E-04	1.08E-02	1.08E-02	1.08E-02	9.72E+00
223rd Street, I-110 to Avalon	2.33E+01	6.99E-03	2.56E-02	2.33E-03	1.89E-01	4.66E-03	3.94E-01	9.33E-03	4.66E-03	3.62E+00	1.81E-03	2.54E-01	9.06E-05	1.81E-03	1.81E-03	1.81E-03	1.63E+00
223rd Street, Avalon to Wilmington	2.45E+01	7.34E-03	2.69E-02	2.45E-03	1.98E-01	4.89E-03	4.13E-01	9.78E-03	4.89E-03	3.80E+00	1.90E-03	2.66E-01	9.50E-05	1.90E-03	1.90E-03	1.90E-03	1.71E+00
223rd Street, Wilmington to Alameda	1.83E+02	5.50E-02	2.02E-01	1.83E-02	1.48E+00	3.66E-02	3.10E+00	7.33E-02	3.66E-02	2.85E+01	1.42E-02	1.99E+00	7.12E-04	1.42E-02	1.42E-02	1.42E-02	1.28E+01
W Wardlow from Alameda to I-710	3.25E+02	9.76E-02	3.58E-01	3.25E-02	2.64E+00	6.51E-02	5.50E+00	1.30E-01	6.51E-02	5.06E+01	2.53E-02	3.54E+00	1.26E-03	2.53E-02	2.53E-02	2.53E-02	2.28E+01

Table B-3
2015 Alternative 2
Annual Average Truck Emissions

		SCAG - Gasoline Trucks					
	Zinc	TOG	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
	7440666		71432	50000	106990	75070	107028
2015, Alternative 2	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to HF Ramps	1.88E-01	7.91E+00	1.93E-01	1.35E-01	4.38E-02	3.05E-02	1.04E-02
Henry Ford Ramps	8.49E-03	2.44E-01	5.95E-03	4.18E-03	1.35E-03	9.41E-04	3.20E-04
Henry Ford n/o Ramps to Alameda	2.78E-02	9.24E-01	2.25E-02	1.58E-02	5.11E-03	3.56E-03	1.21E-03
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	2.65E-01	1.22E+01	2.98E-01	2.09E-01	6.77E-02	4.71E-02	1.60E-02
SR-103 Anaheim to PCH	1.59E-01	1.43E+01	3.48E-01	2.45E-01	7.91E-02	5.51E-02	1.87E-02
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	1.09E-01	1.92E+01	4.68E-01	3.29E-01	1.06E-01	7.41E-02	2.52E-02
SR-103 Ramps south of Sepulveda/Willow							
NB Sepulveda Ramp (G2 Line)	1.34E-02	3.69E+00	8.98E-02	6.30E-02	2.04E-02	1.42E-02	4.83E-03
SB Sepulveda Ramp (F2 Ramp)	9.42E-03	2.59E+00	6.32E-02	4.44E-02	1.43E-02	9.99E-03	3.40E-03
SR-103 Existing, End Ramps to Sepulveda/Willow							
SB Sepulveda Ramp Traffic	1.73E-03	4.78E-01	1.16E-02	8.17E-03	2.64E-03	1.84E-03	6.26E-04
SB+NB Sepulveda Ramp Traffic	6.82E-03	1.88E+00	4.57E-02	3.21E-02	1.04E-02	7.23E-03	2.46E-03
SR-103, Realignment to End (223rd/Wardlow)	3.16E-01	4.68E+01	1.14E+00	8.01E-01	2.59E-01	1.80E-01	6.14E-02
E and W Harry Bridges, Figueroa to start Alameda	6.73E-02	3.23E+01	7.86E-01	5.52E-01	1.79E-01	1.24E-01	4.23E-02
Alameda beginning (E Harry Bridges) to Anaheim	6.57E-02	4.88E+01	1.19E+00	8.34E-01	2.70E-01	1.88E-01	6.39E-02
Alameda Anaheim to Henry Ford	2.46E-02	2.71E+01	6.61E-01	4.64E-01	1.50E-01	1.04E-01	3.56E-02
Alameda, Henry Ford to PCH	3.40E-02	2.24E+01	5.45E-01	3.83E-01	1.24E-01	8.62E-02	2.93E-02
Alameda PCH to 405	1.98E-01	2.94E+02	7.15E+00	5.02E+00	1.62E+00	1.13E+00	3.85E-01
Alameda 405 to del Amo	1.94E-01	1.96E+02	4.77E+00	3.35E+00	1.08E+00	7.54E-01	2.57E-01
Alameda, del Amo to South Santa Fe Avenue	5.80E-02	5.83E+01	1.42E+00	9.97E-01	3.23E-01	2.25E-01	7.64E-02
Alameda, South Santa Fe Avenue to SR-91	7.00E-02	6.75E+01	1.64E+00	1.15E+00	3.74E-01	2.60E-01	8.85E-02
I-110, "C" Street Interchange to Anaheim	9.35E-02	9.21E+01	2.24E+00	1.58E+00	5.09E-01	3.55E-01	1.21E-01
I-110, Anaheim to PCH	1.57E-01	1.74E+02	4.24E+00	2.98E+00	9.63E-01	6.71E-01	2.28E-01
1-110, PCH to Sepulveda	2.83E-01	4.51E+02	1.10E+01	7.70E+00	2.49E+00	1.73E+00	5.90E-01
I-110, Sepulveda to Carson	2.96E-01	6.89E+02	1.68E+01	1.18E+01	3.81E+00	2.65E+00	9.03E-01
I-110, Carson to Del Amo	1.87E-01	5.20E+02	1.27E+01	8.90E+00	2.88E+00	2.00E+00	6.81E-01
I-110, Del Amo to 405	1.12E-01	3.77E+02	9.17E+00	6.44E+00	2.08E+00	1.45E+00	4.93E-01
I-110, 405 to SR-91	1.61E-01	8.74E+02	2.13E+01	1.49E+01	4.83E+00	3.36E+00	1.14E+00
I-710, Anaheim to PCH	3.05E-01	1.31E+02	3.20E+00	2.25E+00	7.27E-01	5.06E-01	1.72E-01
I-710, PCH to Willow	6.41E-01	3.03E+02	7.37E+00	5.18E+00	1.67E+00	1.17E+00	3.96E-01
I-710, Willow to 405	9.66E-01	4.66E+02	1.13E+01	7.96E+00	2.57E+00	1.79E+00	6.10E-01
I-710, 405 to Del Amo	8.84E-01	6.58E+02	1.60E+01	1.12E+01	3.64E+00	2.53E+00	8.62E-01
I-710, Del Amo to Long Beach Blvd Interchange	7.24E-01	6.01E+02	1.46E+01	1.03E+01	3.32E+00	2.31E+00	7.87E-01
I-710, Long Beach Boulevard to SR-91	5.88E-01	5.06E+02	1.23E+01	8.65E+00	2.80E+00	1.95E+00	6.63E-01
PCH, I-110 to Alameda	6.51E-02	1.90E+02	4.64E+00	3.26E+00	1.05E+00	7.33E-01	2.49E-01
PCH, Alameda to SR-103	4.91E-03	2.51E+01	6.12E-01	4.30E-01	1.39E-01	9.67E-02	3.29E-02
PCH, SR-103 to I-710	6.54E-02	2.41E+01	5.86E-01	4.12E-01	1.33E-01	9.27E-02	3.15E-02
Sepulveda, I-110 to Avalon	5.86E-03	7.57E+01	1.84E+00	1.30E+00	4.19E-01	2.92E-01	9.92E-02
Sepulveda, Avalon to Alameda	4.14E-03	6.04E+01	1.47E+00	1.03E+00	3.34E-01	2.32E-01	7.91E-02
Sepulveda, Alameda to ICTF	1.15E-02	1.52E+01	3.70E-01	2.60E-01	8.41E-02	5.86E-02	1.99E-02
Sepulveda, ICTF to SR-103	1.06E-02	2.79E+00	6.80E-02	4.78E-02	1.54E-02	1.08E-02	3.66E-03
Del Amo, I-110 to Wilmington	4.81E-03	1.24E+02	3.01E+00	2.12E+00	6.84E-01	4.76E-01	1.62E-01
Del Amo, Wilmington to Alameda	1.72E-02	1.17E+02	2.85E+00	2.00E+00	6.47E-01	4.50E-01	1.53E-01
Del Amo, Alameda to I-710	1.08E-02	1.04E+02	2.52E+00	1.77E+00	5.73E-01	3.99E-01	1.36E-01
223rd Street, I-110 to Avalon	1.81E-03	5.64E+01	1.37E+00	9.64E-01	3.12E-01	2.17E-01	7.38E-02
223rd Street, Avalon to Wilmington	1.90E-03	4.74E+01	1.15E+00	8.11E-01	2.62E-01	1.82E-01	6.21E-02
223rd Street, Wilmington to Alameda	1.42E-02	4.87E+01	1.19E+00	8.34E-01	2.70E-01	1.88E-01	6.39E-02
W Wardlow from Alameda to I-710	2.53E-02	5.14E+01	1.25E+00	8.79E-01	2.84E-01	1.98E-01	6.73E-02

Table B-4
2030 No Build
Annual Average Truck Emissions

	Length	Average Speed	Port AADT Trucks	SCAG AADT Trucks	Port LNG Trucks	Port Dsl / Alt Trucks	SCAG Gasoline Trucks	SCAG Diesel Trucks
Baseline 2030	mile	mph	veh/day	veh/day	veh/day	veh/day	veh/day	veh/day
SR-47 Mainline, New Dock Ramps to HF Ramps	0.75	40	29370	69	6044	23326	36	33
Henry Ford Ramps	0.15	25	10859	1	3178	7681	1	0
Henry Ford n/o Ramps to Alameda	0.68	25	14347	230	3581	10766	119	111
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	0.95	40	18512	66	2867	15645	34	32
SR-103 Anaheim to PCH	0.57	40	17936	151	3253	14683	78	73
SR-103 PCH to Sepulveda/Willow	1.02	40	11605	222	1819	9786	115	107
E and W Harry Bridges, Figueroa to start Alameda	1.44	35	6078	272	1982	4096	141	131
Alameda beginning (E Harry Bridges) to Anaheim	0.77	35	7076	630	2285	4791	327	303
Alameda Anaheim to Henry Ford	0.42	35	4433	599	1475	2958	311	288
Alameda Henry Ford to PCH	0.34	35	16015	597	4621	11394	310	287
Alameda PCH to 405	2.27	45	17357	2035	4567	12790	1056	979
Alameda 405 to del Amo	1.72	45	10022	1851	2393	7629	961	890
Alameda, del Amo to South Santa Fe Avenue	0.84	45	7232	1311	1427	5805	680	631
Alameda, South Santa Fe Avenue to SR-91	1.15	45	5629	985	1349	4280	511	474
I-110, "C" Street Interchange to Anaheim	0.49	65	19966	3398	5960	14006	1764	1634
I-110, Anaheim to PCH	0.80	65	20290	3821	6088	14202	1983	1838
1-110, PCH to Sepulveda	1.39	65	20706	5332	6282	14424	2767	2565
I-110, Sepulveda to Carson	1.56	65	19197	7976	5847	13350	4140	3836
I-110, Carson to Del Amo	1.02	65	18392	8297	5645	12747	4306	3991
I-110, Del Amo to 405	0.74	65	17738	9470	4592	13146	4915	4555
I-110, 405 to SR-91	1.09	65	14615	13556	4252	10363	7036	6520
I-710, Anaheim to PCH	0.50	65	71248	4202	17778	53470	2181	2021
I-710, PCH to Willow	1.01	65	72139	4496	18605	53534	2333	2163
I-710, Willow to 405	1.52	65	71804	4573	18512	53292	2373	2200
I-710, 405 to Del Amo	1.42	65	67615	7306	17290	50325	3792	3514
I-710, Del Amo to Long Beach Blvd Interchange	1.17	65	66070	8000	16907	49163	4152	3848
I-710, Long Beach Boulevard to SR-91	0.96	65	65231	11993	16681	48550	6224	5769
PCH, I110 to Alameda	2.38	50	3105	1467	767	2338	761	706
PCH, Alameda to SR-103	0.94	50	2634	570	375	2259	296	274
PCH, SR-103 to I-710	0.98	50	19563	858	2271	17292	445	413
Sepulveda, I-110 to Avalon	1.37	40	587	838	136	451	435	403
Sepulveda, Avalon to Alameda	1.70	40	623	1019	78	545	529	490
Sepulveda, Alameda to ICTF	0.67	40	5004	322	758	4246	167	155
Sepulveda, ICTF to SR-103	0.17	40	11605	249	1819	9786	129	120
Del Amo, I-110 to Wilmington	2.96	40	423	896	52	371	465	431
Del Amo, Wilminton to Alameda	0.77	40	1918	2002	606	1312	1039	963
Del Amo, Alameda to I-710	0.87	40	1529	2201	417	1112	1142	1059
223rd Street, I-110 to Avalon	1.36	45	151	744	26	125	386	358
223rd Street, Avalon to Wilmington	1.23	45	105	599	24	81	311	288
223rd Street, Wilmington to Alameda	0.79	45	1227	1136	248	979	590	546
W Wardlow from Alameda to I-710	1.30	45	3672	1493	66	3606	775	718

Table B-4
2030 No Build
Annual Average Truck Emissions

	Port	Port	Port	Port	SCAG		Port	Port	Port	SCAG	
	LNG TOG	LNG PM10	LNG DPM	Dsl Exhst PM	Gasoline TOG	Dsl Exhst PM	LNG TOG	LNG PM10	LNG+DSL DPM	Gasoline TOG	Dsl Exhst PM
Baseline 2030	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	lb/yr	lb/yr	lb/year	lb/year	lb/year
SR-47 Mainline, New Dock Ramps to HF Ramps	0.489	0.111	0.00587	0.052	0.027	0.049	1,773	404	749	1	1
Henry Ford Ramps	0.489	0.111	0.00587	0.045	0.051	0.053	190	43	44	0	0
Henry Ford n/o Ramps to Alameda	0.489	0.111	0.00587	0.045	0.051	0.053	965	220	278	3	3
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	0.489	0.111	0.00587	0.052	0.027	0.049	1,069	244	633	1	1
SR-103 Anaheim to PCH	0.489	0.111	0.00587	0.052	0.027	0.049	734	167	361	1	2
SR-103 PCH to Sepulveda/Willow	0.489	0.111	0.00587	0.052	0.027	0.049	729	166	426	3	4
E and W Harry Bridges, Figueroa to start Alameda	0.489	0.111	0.00587	0.047	0.032	0.048	1,125	257	239	5	7
Alameda beginning (E Harry Bridges) to Anaheim	0.489	0.111	0.00587	0.047	0.032	0.048	692	158	149	6	9
Alameda Anaheim to Henry Ford	0.489	0.111	0.00587	0.047	0.032	0.048	245	56	51	3	5
Alameda Henry Ford to PCH	0.489	0.111	0.00587	0.047	0.032	0.048	625	142	157	3	4
Alameda PCH to 405	0.489	0.111	0.00587	0.058	0.024	0.051	4,073	928	1,398	46	90
Alameda 405 to del Amo	0.489	0.111	0.00587	0.058	0.024	0.051	1,620	369	631	32	62
Alameda, del Amo to South Santa Fe Avenue	0.489	0.111	0.00587	0.058	0.024	0.051	472	108	233	11	22
Alameda, South Santa Fe Avenue to SR-91	0.489	0.111	0.00587	0.058	0.024	0.051	612	139	237	11	22
I-110, "C" Street Interchange to Anaheim	0.489	0.111	0.00587	0.101	0.021	0.074	1,153	263	572	15	48
I-110, Anaheim to PCH	0.489	0.111	0.00587	0.101	0.021	0.074	1,924	438	948	27	88
1-110, PCH to Sepulveda	0.489	0.111	0.00587	0.101	0.021	0.074	3,426	781	1,662	65	212
I-110, Sepulveda to Carson	0.489	0.111	0.00587	0.101	0.021	0.074	3,583	817	1,729	109	356
I-110, Carson to Del Amo	0.489	0.111	0.00587	0.101	0.021	0.074	2,269	517	1,083	74	243
I-110, Del Amo to 405	0.489	0.111	0.00587	0.101	0.021	0.074	1,339	305	806	62	201
I-110, 405 to SR-91	0.489	0.111	0.00587	0.101	0.021	0.074	1,828	417	940	130	424
I-710, Anaheim to PCH	0.489	0.111	0.00587	0.101	0.021	0.074	3,494	796	2,207	18	60
I-710, PCH to Willow	0.489	0.111	0.00587	0.101	0.021	0.074	7,360	1,677	4,452	40	130
I-710, Willow to 405	0.489	0.111	0.00587	0.101	0.021	0.074	11,095	2,529	6,714	61	200
I-710, 405 to Del Amo	0.489	0.111	0.00587	0.101	0.021	0.074	9,656	2,201	5,907	91	297
I-710, Del Amo to Long Beach Blvd Interchange	0.489	0.111	0.00587	0.101	0.021	0.074	7,810	1,780	4,773	82	269
I-710, Long Beach Boulevard to SR-91	0.489	0.111	0.00587	0.101	0.021	0.074	6,307	1,438	3,858	101	330
PCH, I110 to Alameda	0.489	0.111	0.00587	0.066	0.022	0.055	718	164	305	32	74
PCH, Alameda to SR-103	0.489	0.111	0.00587	0.066	0.022	0.055	139	32	115	5	11
PCH, SR-103 to I-710	0.489	0.111	0.00587	0.066	0.022	0.055	877	200	916	8	18
Sepulveda, I-110 to Avalon	0.489	0.111	0.00587	0.052	0.027	0.049	73	17	27	13	22
Sepulveda, Avalon to Alameda	0.489	0.111	0.00587	0.052	0.027	0.049	52	12	39	20	33
Sepulveda, Alameda to ICTF	0.489	0.111	0.00587	0.052	0.027	0.049	201	46	122	2	4
Sepulveda, ICTF to SR-103	0.489	0.111	0.00587	0.052	0.027	0.049	123	28	72	0	1
Del Amo, I-110 to Wilmington	0.489	0.111	0.00587	0.052	0.027	0.049	60	14	47	30	50
Del Amo, Wilminton to Alameda	0.489	0.111	0.00587	0.052	0.027	0.049	183	42	44	17	29
Del Amo, Alameda to I-710	0.489	0.111	0.00587	0.052	0.027	0.049	143	33	42	22	36
223rd Street, I-110 to Avalon	0.489	0.111	0.00587	0.058	0.024	0.051	14	3	8	10	20
223rd Street, Avalon to Wilmington	0.489	0.111	0.00587	0.058	0.024	0.051	11	3	5	7	14
223rd Street, Wilmington to Alameda	0.489	0.111	0.00587	0.058	0.024	0.051	77	18	37	9	18
W Wardlow from Alameda to I-710	0.489	0.111	0.00587	0.058	0.024	0.051	34	8	219	19	38

Table B-4
2030 No Build
Annual Average Truck Emissions

	Total Average Annual Toxic Emissions from Trucks																	
	DPM	Acet-aldehyde	Acrolein	Benzene	Bromine	1,3-Butadiene	Chlorine	Chromium	Copper	Form-aldehyde	n-Hexane	Manganese	Nickel	Propylene	Sulfates	Toluene	Xylenes	Zinc
	9901	75070	107028	71432	7726956	106990	7782505	18540299	7440508	50000	110543	7439965	7440020	115071	9960	108883	1330207	7440666
Baseline 2030	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to HF Ramps	7.50E+02	5.33E-01	6.56E-04	1.96E+00	2.02E-01	2.70E-03	2.83E+01	1.01E-02	2.02E-01	1.44E+01	3.55E-01	2.02E-01	2.02E-01	3.00E+01	1.82E+02	7.09E-01	3.55E-01	2.02E-01
Henry Ford Ramps	4.43E+01	5.69E-02	3.65E-06	2.09E-01	2.16E-02	1.50E-05	3.02E+00	1.08E-03	2.16E-02	1.54E+00	3.79E-02	2.16E-02	2.16E-02	3.20E+00	1.94E+01	7.58E-02	3.79E-02	2.16E-02
Henry Ford n/o Ramps to Alameda	2.81E+02	2.98E-01	3.79E-03	1.13E+00	1.10E-01	1.56E-02	1.54E+01	5.50E-03	1.10E-01	7.86E+00	1.93E-01	1.10E-01	1.10E-01	1.63E+01	9.89E+01	3.86E-01	1.93E-01	1.10E-01
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	6.34E+02	3.22E-01	7.97E-04	1.19E+00	1.22E-01	3.29E-03	1.71E+01	6.09E-03	1.22E-01	8.67E+00	2.14E-01	1.22E-01	1.22E-01	1.81E+01	1.10E+02	4.28E-01	2.14E-01	1.22E-01
SR-103 Anaheim to PCH	3.63E+02	2.23E-01	1.10E-03	8.28E-01	8.37E-02	4.55E-03	1.17E+01	4.18E-03	8.37E-02	5.96E+00	1.47E-01	8.37E-02	8.37E-02	1.24E+01	7.53E+01	2.94E-01	1.47E-01	8.37E-02
SR-103 PCH to Sepulveda/Willow	4.30E+02	2.25E-01	2.88E-03	8.56E-01	8.31E-02	1.19E-02	1.16E+01	4.15E-03	8.31E-02	5.94E+00	1.46E-01	8.31E-02	8.31E-02	1.23E+01	7.48E+01	2.92E-01	1.46E-01	8.31E-02
E and W Harry Bridges, Figueroa to start Alameda	2.47E+02	3.50E-01	5.93E-03	1.35E+00	1.28E-01	2.44E-02	1.80E+01	6.41E-03	1.28E-01	9.19E+00	2.25E-01	1.28E-01	1.28E-01	1.90E+01	1.15E+02	4.50E-01	2.25E-01	1.28E-01
Alameda beginning (E Harry Bridges) to Anaheim	1.58E+02	2.23E-01	7.32E-03	8.98E-01	7.89E-02	3.02E-02	1.10E+01	3.94E-03	7.89E-02	5.69E+00	1.38E-01	7.89E-02	7.89E-02	1.17E+01	7.10E+01	2.77E-01	1.38E-01	7.89E-02
Alameda Anaheim to Henry Ford	5.53E+01	8.17E-02	3.82E-03	3.40E-01	2.79E-02	1.57E-02	3.91E+00	1.39E-03	2.79E-02	2.03E+00	4.90E-02	2.79E-02	2.79E-02	4.14E+00	2.51E+01	9.79E-02	4.90E-02	2.79E-02
Alameda Henry Ford to PCH	1.61E+02	1.94E-01	3.10E-03	7.45E-01	7.12E-02	1.28E-02	9.97E+00	3.56E-03	7.12E-02	5.10E+00	1.25E-01	7.12E-02	7.12E-02	1.06E+01	6.41E+01	2.50E-01	1.25E-01	7.12E-02
Alameda PCH to 405	1.49E+03	1.34E+00	5.22E-02	5.46E+00	4.64E-01	2.15E-01	6.50E+01	2.32E-02	4.64E-01	3.36E+01	8.15E-01	4.64E-01	4.64E-01	6.88E+01	4.18E+02	1.63E+00	8.15E-01	4.64E-01
Alameda 405 to del Amo	6.93E+02	5.64E-01	3.61E-02	2.46E+00	1.85E-01	1.49E-01	2.59E+01	9.23E-03	1.85E-01	1.36E+01	3.24E-01	1.85E-01	1.85E-01	2.74E+01	1.66E+02	6.48E-01	3.24E-01	1.85E-01
Alameda, del Amo to South Santa Fe Avenue	2.54E+02	1.69E-01	1.25E-02	7.52E-01	5.38E-02	5.15E-02	7.53E+00	2.69E-03	5.38E-02	3.97E+00	9.44E-02	5.38E-02	5.38E-02	7.98E+00	4.84E+01	1.89E-01	9.44E-02	5.38E-02
Alameda, South Santa Fe Avenue to SR-91	2.59E+02	2.11E-01	1.29E-02	9.13E-01	6.97E-02	5.30E-02	9.76E+00	3.49E-03	6.97E-02	5.11E+00	1.22E-01	6.97E-02	6.97E-02	1.03E+01	6.28E+01	2.45E-01	1.22E-01	6.97E-02
I-110, "C" Street Interchange to Anaheim	6.20E+02	3.82E-01	1.66E-02	1.58E+00	1.31E-01	6.83E-02	1.84E+01	6.57E-03	1.31E-01	9.54E+00	2.31E-01	1.31E-01	1.31E-01	1.95E+01	1.18E+02	4.61E-01	2.31E-01	1.31E-01
I-110, Anaheim to PCH	1.04E+03	6.43E-01	3.04E-02	2.68E+00	2.19E-01	1.25E-01	3.07E+01	1.10E-02	2.19E-01	1.59E+01	3.85E-01	2.19E-01	2.19E-01	3.25E+01	1.97E+02	7.69E-01	3.85E-01	2.19E-01
1-110, PCH to Sepulveda	1.87E+03	1.19E+00	7.33E-02	5.14E+00	3.90E-01	3.02E-01	5.47E+01	1.95E-02	3.90E-01	2.86E+01	6.85E-01	3.90E-01	3.90E-01	5.79E+01	3.51E+02	1.37E+00	6.85E-01	3.90E-01
I-110, Sepulveda to Carson	2.08E+03	1.34E+00	1.23E-01	6.24E+00	4.08E-01	5.08E-01	5.72E+01	2.04E-02	4.08E-01	3.05E+01	7.17E-01	4.08E-01	4.08E-01	6.05E+01	3.67E+02	1.43E+00	7.17E-01	4.08E-01
I-110, Carson to Del Amo	1.33E+03	8.63E-01	8.40E-02	4.06E+00	2.59E-01	3.46E-01	3.62E+01	1.29E-02	2.59E-01	1.94E+01	4.54E-01	2.59E-01	2.59E-01	3.83E+01	2.33E+02	9.08E-01	4.54E-01	2.59E-01
I-110, Del Amo to 405	1.01E+03	5.52E-01	6.95E-02	2.77E+00	1.53E-01	2.87E-01	2.14E+01	7.63E-03	1.53E-01	1.17E+01	2.68E-01	1.53E-01	1.53E-01	2.26E+01	1.37E+02	5.36E-01	2.68E-01	1.53E-01
I-110, 405 to SR-91	1.36E+03	8.67E-01	1.47E-01	4.75E+00	2.08E-01	6.05E-01	2.92E+01	1.04E-02	2.08E-01	1.66E+01	3.66E-01	2.08E-01	2.08E-01	3.09E+01	1.88E+02	7.31E-01	3.66E-01	2.08E-01
I-710, Anaheim to PCH	2.27E+03	1.09E+00	2.08E-02	4.23E+00	3.98E-01	8.58E-02	5.57E+01	1.99E-02	3.98E-01	2.85E+01	6.99E-01	3.98E-01	3.98E-01	5.90E+01	3.58E+02	1.40E+00	6.99E-01	3.98E-01
I-710, PCH to Willow	4.58E+03	2.31E+00	4.48E-02	8.93E+00	8.39E-01	1.85E-01	1.17E+02	4.19E-02	8.39E-01	6.02E+01	1.47E+00	8.39E-01	8.39E-01	1.24E+02	7.55E+02	2.94E+00	1.47E+00	8.39E-01
I-710, Willow to 405	6.91E+03	3.48E+00	6.90E-02	1.35E+01	1.26E+00	2.85E-01	1.77E+02	6.32E-02	1.26E+00	9.07E+01	2.22E+00	1.26E+00	1.26E+00	1.87E+02	1.14E+03	4.44E+00	2.22E+00	1.26E+00
I-710, 405 to Del Amo	6.20E+03	3.12E+00	1.03E-01	1.25E+01	1.10E+00	4.24E-01	1.54E+02	5.50E-02	1.10E+00	7.95E+01	1.93E+00	1.10E+00	1.10E+00	1.63E+02	9.90E+02	3.86E+00	1.93E+00	1.10E+00
I-710, Del Amo to Long Beach Blvd Interchange	5.04E+03	2.54E+00	9.31E-02	1.03E+01	8.90E-01	3.84E-01	1.25E+02	4.45E-02	8.90E-01	6.44E+01	1.56E+00	8.90E-01	8.90E-01	1.32E+02	8.01E+02	3.12E+00	1.56E+00	8.90E-01
I-710, Long Beach Boulevard to SR-91	4.19E+03	2.14E+00	1.14E-01	9.07E+00	7.19E-01	4.71E-01	1.01E+02	3.59E-02	7.19E-01	5.25E+01	1.26E+00	7.19E-01	7.19E-01	1.07E+02	6.47E+02	2.52E+00	1.26E+00	7.19E-01
PCH, I110 to Alameda	3.79E+02	2.94E-01	3.62E-02	1.47E+00	8.18E-02	1.49E-01	1.15E+01	4.09E-03	8.18E-02	6.25E+00	1.44E-01	8.18E-02	8.18E-02	1.21E+01	7.36E+01	2.87E-01	1.44E-01	8.18E-02
PCH, Alameda to SR-103	1.26E+02	5.38E-02	5.57E-03	2.57E-01	1.58E-02	2.30E-02	2.22E+00	7.92E-04	1.58E-02	1.19E+00	2.78E-02	1.58E-02	1.58E-02	2.35E+00	1.43E+01	5.56E-02	2.78E-02	1.58E-02
PCH, SR-103 to I-710	9.34E+02	2.82E-01	8.74E-03	1.13E+00	1.00E-01	3.60E-02	1.40E+01	5.00E-03	1.00E-01	7.21E+00	1.75E-01	1.00E-01	1.00E-01	1.48E+01	9.00E+01	3.51E-01	1.75E-01	1.00E-01
Sepulveda, I-110 to Avalon	4.83E+01	5.36E-02	1.46E-02	3.53E-01	8.32E-03	6.03E-02	1.17E+00	4.16E-04	8.32E-03	7.68E-01	1.46E-02	8.32E-03	8.32E-03	1.23E+00	7.49E+00	2.92E-02	1.46E-02	8.32E-03
Sepulveda, Avalon to Alameda	7.19E+01	6.35E-02	2.21E-02	4.69E-01	5.97E-03	9.09E-02	8.36E-01	2.99E-04	5.97E-03	6.90E-01	1.05E-02	5.97E-03	5.97E-03	8.86E-01	5.38E+00	2.10E-02	1.05E-02	5.97E-03
Sepulveda, Alameda to ICTF	1.26E+02	6.64E-02	2.77E-03	2.73E-01	2.29E-02	1.14E-02	3.21E+00	1.15E-03	2.29E-02	1.66E+00	4.03E-02	2.29E-02	2.29E-02	3.40E+00	2.06E+01	8.05E-02	4.03E-02	2.29E-02
Sepulveda, ICTF to SR-103	7.25E+01	3.80E-02	5.44E-04	1.45E-01	1.40E-02	2.24E-03	1.96E+00	6.99E-04	1.40E-02	1.00E+00	2.45E-02	1.40E-02	1.40E-02	2.07E+00	1.26E+01	4.91E-02	2.45E-02	1.40E-02
Del Amo, I-110 to Wilmington	9.66E+01	9.13E-02	3.38E-02	6.96E-01	6.85E-03	1.39E-01	9.58E-01	3.42E-04	6.85E-03	8.93E-01	1.20E-02	6.85E-03	6.85E-03	1.02E+00	6.16E+00	2.40E-02	1.20E-02	6.85E-03
Del Amo, Wilminton to Alameda	7.31E+01	9.71E-02	1.95E-02	5.65E-01	2.08E-02	8.05E-02	2.91E+00	1.04E-03	2.08E-02	1.71E+00	3.65E-02	2.08E-02	2.08E-02	3.08E+00	1.87E+01	7.30E-02	3.65E-02	2.08E-02
Del Amo, Alameda to I-710	7.84E+01	9.59E-02	2.45E-02	6.14E-01	1.63E-02	1.01E-01	2.28E+00	8.15E-04	1.63E-02	1.45E+00	2.86E-02	1.63E-02	1.63E-02	2.42E+00	1.47E+01	5.72E-02	2.86E-02	1.63E-02
223rd Street, I-110 to Avalon	2.80E+01	2.90E-02	1.15E-02	2.29E-01	1.56E-03	4.74E-02	2.19E-01	7.82E-05	1.56E-03	2.49E-01	2.75E-03	1.56E-03	1.56E-03	2.32E-01	1.41E+00	5.49E-03	2.75E-03	1.56E-03
223rd Street, Avalon to Wilmington	1.92E+01	2.14E-02	8.31E-03	1.68E-01	1.30E-03	3.43E-02	1.82E-01	6.48E-05	1.30E-03	1.92E-01	2.28E-03	1.30E-03	1.30E-03	1.92E-01	1.17E+00	4.55E-03	2.28E-03	1.30E-03
223rd Street, Wilmington to Alameda	5.45E+01	4.51E-02	1.02E-02	2.74E-01	8.76E-03	4.19E-02	1.23E+00	4.38E-04	8.76E-03	7.45E-01	1.54E-02	8.76E-03	8.76E-03	1.30E+00	7.88E+00	3.07E-02	1.54E-02	8.76E-03
W Wardlow from Alameda to I-710	2.57E+02	5.78E-02	2.20E-02	4.47E-01	3.87E-03	9.06E-02	5.42E-01	1.94E-04	3.87E-03	5.40E-01	6.79E-03	3.87E-03	3.87E-03	5.74E-01	3.48E+00	1.36E-02	6.79E-03	3.87E-03

Table B-4
2030 No Build
Annual Average Truck Emissions

	Port - LNG Emissions									Port - LNG Emissions								
	TOG	Acetaldehyde	Benzene	Ethylbenzene	Formaldehyde	n-Hexane	Propylene	Toluene	Xylenes	PM10	Bromine	Chlorine	Chromium (hex)	Copper	Manganese	Nickel	Sulfates	Zinc
		75070	71432	100414	50000	110543	115071	108883	1330207		7726956	7782505	18540299	7440508	7439965	7440020	9960	7440666
Baseline 2030	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to HF Ramps	1.77E+03	5.32E-01	1.95E+00	1.77E-01	1.44E+01	3.55E-01	3.00E+01	7.09E-01	3.55E-01	4.04E+02	2.02E-01	2.83E+01	1.01E-02	2.02E-01	2.02E-01	2.02E-01	1.82E+02	2.02E-01
Henry Ford Ramps	1.90E+02	5.69E-02	2.09E-01	1.90E-02	1.54E+00	3.79E-02	3.20E+00	7.58E-02	3.79E-02	4.32E+01	2.16E-02	3.02E+00	1.08E-03	2.16E-02	2.16E-02	2.16E-02	1.94E+01	2.16E-02
Henry Ford n/o Ramps to Alameda	9.65E+02	2.89E-01	1.06E+00	9.65E-02	7.81E+00	1.93E-01	1.63E+01	3.86E-01	1.93E-01	2.20E+02	1.10E-01	1.54E+01	5.50E-03	1.10E-01	1.10E-01	1.10E-01	9.89E+01	1.10E-01
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.07E+03	3.21E-01	1.18E+00	1.07E-01	8.66E+00	2.14E-01	1.81E+01	4.28E-01	2.14E-01	2.44E+02	1.22E-01	1.71E+01	6.09E-03	1.22E-01	1.22E-01	1.22E-01	1.10E+02	1.22E-01
SR-103 Anaheim to PCH	7.34E+02	2.20E-01	8.07E-01	7.34E-02	5.95E+00	1.47E-01	1.24E+01	2.94E-01	1.47E-01	1.67E+02	8.37E-02	1.17E+01	4.18E-03	8.37E-02	8.37E-02	8.37E-02	7.53E+01	8.37E-02
SR-103 PCH to Sepulveda/Willow	7.29E+02	2.19E-01	8.02E-01	7.29E-02	5.90E+00	1.46E-01	1.23E+01	2.92E-01	1.46E-01	1.66E+02	8.31E-02	1.16E+01	4.15E-03	8.31E-02	8.31E-02	8.31E-02	7.48E+01	8.31E-02
E and W Harry Bridges, Figueroa to start Alameda	1.13E+03	3.38E-01	1.24E+00	1.13E-01	9.12E+00	2.25E-01	1.90E+01	4.50E-01	2.25E-01	2.57E+02	1.28E-01	1.80E+01	6.41E-03	1.28E-01	1.28E-01	1.28E-01	1.15E+02	1.28E-01
Alameda beginning (E Harry Bridges) to Anaheim	6.92E+02	2.08E-01	7.61E-01	6.92E-02	5.61E+00	1.38E-01	1.17E+01	2.77E-01	1.38E-01	1.58E+02	7.89E-02	1.10E+01	3.94E-03	7.89E-02	7.89E-02	7.89E-02	7.10E+01	7.89E-02
Alameda Anaheim to Henry Ford	2.45E+02	7.34E-02	2.69E-01	2.45E-02	1.98E+00	4.90E-02	4.14E+00	9.79E-02	4.90E-02	5.58E+01	2.79E-02	3.91E+00	1.39E-03	2.79E-02	2.79E-02	2.79E-02	2.51E+01	2.79E-02
Alameda Henry Ford to PCH	6.25E+02	1.87E-01	6.87E-01	6.25E-02	5.06E+00	1.25E-01	1.06E+01	2.50E-01	1.25E-01	1.42E+02	7.12E-02	9.97E+00	3.56E-03	7.12E-02	7.12E-02	7.12E-02	6.41E+01	7.12E-02
Alameda PCH to 405	4.07E+03	1.22E+00	4.48E+00	4.07E-01	3.30E+01	8.15E-01	6.88E+01	1.63E+00	8.15E-01	9.28E+02	4.64E-01	6.50E+01	2.32E-02	4.64E-01	4.64E-01	4.64E-01	4.18E+02	4.64E-01
Alameda 405 to del Amo	1.62E+03	4.86E-01	1.78E+00	1.62E-01	1.31E+01	3.24E-01	2.74E+01	6.48E-01	3.24E-01	3.69E+02	1.85E-01	2.59E+01	9.23E-03	1.85E-01	1.85E-01	1.85E-01	1.66E+02	1.85E-01
Alameda, del Amo to South Santa Fe Avenue	4.72E+02	1.42E-01	5.19E-01	4.72E-02	3.82E+00	9.44E-02	7.98E+00	1.89E-01	9.44E-02	1.08E+02	5.38E-02	7.53E+00	2.69E-03	5.38E-02	5.38E-02	5.38E-02	4.84E+01	5.38E-02
Alameda, South Santa Fe Avenue to SR-91	6.12E+02	1.84E-01	6.73E-01	6.12E-02	4.96E+00	1.22E-01	1.03E+01	2.45E-01	1.22E-01	1.39E+02	6.97E-02	9.76E+00	3.49E-03	6.97E-02	6.97E-02	6.97E-02	6.28E+01	6.97E-02
I-110, "C" Street Interchange to Anaheim	1.15E+03	3.46E-01	1.27E+00	1.15E-01	9.34E+00	2.31E-01	1.95E+01	4.61E-01	2.31E-01	2.63E+02	1.31E-01	1.84E+01	6.57E-03	1.31E-01	1.31E-01	1.31E-01	1.18E+02	1.31E-01
I-110, Anaheim to PCH	1.92E+03	5.77E-01	2.12E+00	1.92E-01	1.56E+01	3.85E-01	3.25E+01	7.69E-01	3.85E-01	4.38E+02	2.19E-01	3.07E+01	1.10E-02	2.19E-01	2.19E-01	2.19E-01	1.97E+02	2.19E-01
1-110, PCH to Sepulveda	3.43E+03	1.03E+00	3.77E+00	3.43E-01	2.78E+01	6.85E-01	5.79E+01	1.37E+00	6.85E-01	7.81E+02	3.90E-01	5.47E+01	1.95E-02	3.90E-01	3.90E-01	3.90E-01	3.51E+02	3.90E-01
I-110, Sepulveda to Carson	3.58E+03	1.07E+00	3.94E+00	3.58E-01	2.90E+01	7.17E-01	6.05E+01	1.43E+00	7.17E-01	8.17E+02	4.08E-01	5.72E+01	2.04E-02	4.08E-01	4.08E-01	4.08E-01	3.67E+02	4.08E-01
I-110, Carson to Del Amo	2.27E+03	6.81E-01	2.50E+00	2.27E-01	1.84E+01	4.54E-01	3.83E+01	9.08E-01	4.54E-01	5.17E+02	2.59E-01	3.62E+01	1.29E-02	2.59E-01	2.59E-01	2.59E-01	2.33E+02	2.59E-01
I-110, Del Amo to 405	1.34E+03	4.02E-01	1.47E+00	1.34E-01	1.08E+01	2.68E-01	2.26E+01	5.36E-01	2.68E-01	3.05E+02	1.53E-01	2.14E+01	7.63E-03	1.53E-01	1.53E-01	1.53E-01	1.37E+02	1.53E-01
I-110, 405 to SR-91	1.83E+03	5.48E-01	2.01E+00	1.83E-01	1.48E+01	3.66E-01	3.09E+01	7.31E-01	3.66E-01	4.17E+02	2.08E-01	2.92E+01	1.04E-02	2.08E-01	2.08E-01	2.08E-01	1.88E+02	2.08E-01
I-710, Anaheim to PCH	3.49E+03	1.05E+00	3.84E+00	3.49E-01	2.83E+01	6.99E-01	5.90E+01	1.40E+00	6.99E-01	7.96E+02	3.98E-01	5.57E+01	1.99E-02	3.98E-01	3.98E-01	3.98E-01	3.58E+02	3.98E-01
I-710, PCH to Willow	7.36E+03	2.21E+00	8.10E+00	7.36E-01	5.96E+01	1.47E+00	1.24E+02	2.94E+00	1.47E+00	1.68E+03	8.39E-01	1.17E+02	4.19E-02	8.39E-01	8.39E-01	8.39E-01	7.55E+02	8.39E-01
I-710, Willow to 405	1.11E+04	3.33E+00	1.22E+01	1.11E+00	8.99E+01	2.22E+00	1.87E+02	4.44E+00	2.22E+00	2.53E+03	1.26E+00	1.77E+02	6.32E-02	1.26E+00	1.26E+00	1.26E+00	1.14E+03	1.26E+00
I-710, 405 to Del Amo	9.66E+03	2.90E+00	1.06E+01	9.66E-01	7.82E+01	1.93E+00	1.63E+02	3.86E+00	1.93E+00	2.20E+03	1.10E+00	1.54E+02	5.50E-02	1.10E+00	1.10E+00	1.10E+00	9.90E+02	1.10E+00
I-710, Del Amo to Long Beach Blvd Interchange	7.81E+03	2.34E+00	8.59E+00	7.81E-01	6.33E+01	1.56E+00	1.32E+02	3.12E+00	1.56E+00	1.78E+03	8.90E-01	1.25E+02	4.45E-02	8.90E-01	8.90E-01	8.90E-01	8.01E+02	8.90E-01
I-710, Long Beach Boulevard to SR-91	6.31E+03	1.89E+00	6.94E+00	6.31E-01	5.11E+01	1.26E+00	1.07E+02	2.52E+00	1.26E+00	1.44E+03	7.19E-01	1.01E+02	3.59E-02	7.19E-01	7.19E-01	7.19E-01	6.47E+02	7.19E-01
PCH, I110 to Alameda	7.18E+02	2.15E-01	7.90E-01	7.18E-02	5.81E+00	1.44E-01	1.21E+01	2.87E-01	1.44E-01	1.64E+02	8.18E-02	1.15E+01	4.09E-03	8.18E-02	8.18E-02	8.18E-02	7.36E+01	8.18E-02
PCH, Alameda to SR-103	1.39E+02	4.17E-02	1.53E-01	1.39E-02	1.13E+00	2.78E-02	2.35E+00	5.56E-02	2.78E-02	3.17E+01	1.58E-02	2.22E+00	7.92E-04	1.58E-02	1.58E-02	1.58E-02	1.43E+01	1.58E-02
PCH, SR-103 to I-710	8.77E+02	2.63E-01	9.65E-01	8.77E-02	7.11E+00	1.75E-01	1.48E+01	3.51E-01	1.75E-01	2.00E+02	1.00E-01	1.40E+01	5.00E-03	1.00E-01	1.00E-01	1.00E-01	9.00E+01	1.00E-01
Sepulveda, I-110 to Avalon	7.30E+01	2.19E-02	8.03E-02	7.30E-03	5.92E-01	1.46E-02	1.23E+00	2.92E-02	1.46E-02	1.66E+01	8.32E-03	1.17E+00	4.16E-04	8.32E-03	8.32E-03	8.32E-03	7.49E+00	8.32E-03
Sepulveda, Avalon to Alameda	5.24E+01	1.57E-02	5.76E-02	5.24E-03	4.24E-01	1.05E-02	8.86E-01	2.10E-02	1.05E-02	1.19E+01	5.97E-03	8.36E-01	2.99E-04	5.97E-03	5.97E-03	5.97E-03	5.38E+00	5.97E-03
Sepulveda, Alameda to ICTF	2.01E+02	6.04E-02	2.21E-01	2.01E-02	1.63E+00	4.03E-02	3.40E+00	8.05E-02	4.03E-02	4.59E+01	2.29E-02	3.21E+00	1.15E-03	2.29E-02	2.29E-02	2.29E-02	2.06E+01	2.29E-02
Sepulveda, ICTF to SR-103	1.23E+02	3.68E-02	1.35E-01	1.23E-02	9.94E-01	2.45E-02	2.07E+00	4.91E-02	2.45E-02	2.80E+01	1.40E-02	1.96E+00	6.99E-04	1.40E-02	1.40E-02	1.40E-02	1.26E+01	1.40E-02
Del Amo, I-110 to Wilmington	6.01E+01	1.80E-02	6.61E-02	6.01E-03	4.87E-01	1.20E-02	1.02E+00	2.40E-02	1.20E-02	1.37E+01	6.85E-03	9.58E-01	3.42E-04	6.85E-03	6.85E-03	6.85E-03	6.16E+00	6.85E-03
Del Amo, Wilminton to Alameda	1.83E+02	5.48E-02	2.01E-01	1.83E-02	1.48E+00	3.65E-02	3.08E+00	7.30E-02	3.65E-02	4.16E+01	2.08E-02	2.91E+00	1.04E-03	2.08E-02	2.08E-02	2.08E-02	1.87E+01	2.08E-02
Del Amo, Alameda to I-710	1.43E+02	4.29E-02	1.57E-01	1.43E-02	1.16E+00	2.86E-02	2.42E+00	5.72E-02	2.86E-02	3.26E+01	1.63E-02	2.28E+00	8.15E-04	1.63E-02	1.63E-02	1.63E-02	1.47E+01	1.63E-02
223rd Street, I-110 to Avalon	1.37E+01	4.12E-03	1.51E-02	1.37E-03	1.11E-01	2.75E-03	2.32E-01	5.49E-03	2.75E-03	3.13E+00	1.56E-03	2.19E-01	7.82E-05	1.56E-03	1.56E-03	1.56E-03	1.41E+00	1.56E-03
223rd Street, Avalon to Wilmington	1.14E+01	3.41E-03	1.25E-02	1.14E-03	9.22E-02	2.28E-03	1.92E-01	4.55E-03	2.28E-03	2.59E+00	1.30E-03	1.82E-01	6.48E-05	1.30E-03	1.30E-03	1.30E-03	1.17E+00	1.30E-03
223rd Street, Wilmington to Alameda	7.69E+01	2.31E-02	8.46E-02	7.69E-03	6.23E-01	1.54E-02	1.30E+00	3.07E-02	1.54E-02	1.75E+01	8.76E-03	1.23E+00	4.38E-04	8.76E-03	8.76E-03	8.76E-03	7.88E+00	8.76E-03
W Wardlow from Alameda to I-710	3.40E+01	1.02E-02	3.74E-02	3.40E-03	2.75E-01	6.79E-03	5.74E-01	1.36E-02	6.79E-03	7.74E+00	3.87E-03	5.42E-01	1.94E-04	3.87E-03	3.87E-03	3.87E-03	3.48E+00	3.87E-03

Table B-4
2030 No Build
Annual Average Truck Emissions

	SCAG - Gasoline Trucks					
	TOG	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
		71432	50000	106990	75070	107028
Baseline 2030	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to HF Ramps	5.80E-01	1.22E-02	7.89E-03	2.70E-03	1.42E-03	6.56E-04
Henry Ford Ramps	3.23E-03	6.81E-05	4.39E-05	1.50E-05	7.91E-06	3.65E-06
Henry Ford n/o Ramps to Alameda	3.35E+00	7.07E-02	4.56E-02	1.56E-02	8.22E-03	3.79E-03
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	7.05E-01	1.49E-02	9.59E-03	3.29E-03	1.73E-03	7.97E-04
SR-103 Anaheim to PCH	9.77E-01	2.06E-02	1.33E-02	4.55E-03	2.39E-03	1.10E-03
SR-103 PCH to Sepulveda/Willow	2.55E+00	5.37E-02	3.47E-02	1.19E-02	6.25E-03	2.88E-03
E and W Harry Bridges, Figueroa to start Alameda	5.25E+00	1.11E-01	7.14E-02	2.44E-02	1.29E-02	5.93E-03
Alameda beginning (E Harry Bridges) to Anaheim	6.48E+00	1.37E-01	8.81E-02	3.02E-02	1.59E-02	7.32E-03
Alameda Anaheim to Henry Ford	3.38E+00	7.12E-02	4.59E-02	1.57E-02	8.27E-03	3.82E-03
Alameda Henry Ford to PCH	2.74E+00	5.78E-02	3.73E-02	1.28E-02	6.72E-03	3.10E-03
Alameda PCH to 405	4.62E+01	9.75E-01	6.29E-01	2.15E-01	1.13E-01	5.22E-02
Alameda 405 to del Amo	3.19E+01	6.73E-01	4.34E-01	1.49E-01	7.82E-02	3.61E-02
Alameda, del Amo to South Santa Fe Avenue	1.10E+01	2.33E-01	1.50E-01	5.15E-02	2.71E-02	1.25E-02
Alameda, South Santa Fe Avenue to SR-91	1.14E+01	2.40E-01	1.55E-01	5.30E-02	2.79E-02	1.29E-02
I-110, "C" Street Interchange to Anaheim	1.47E+01	3.09E-01	1.99E-01	6.83E-02	3.59E-02	1.66E-02
I-110, Anaheim to PCH	2.69E+01	5.67E-01	3.66E-01	1.25E-01	6.59E-02	3.04E-02
1-110, PCH to Sepulveda	6.48E+01	1.37E+00	8.82E-01	3.02E-01	1.59E-01	7.33E-02
I-110, Sepulveda to Carson	1.09E+02	2.30E+00	1.48E+00	5.08E-01	2.67E-01	1.23E-01
I-110, Carson to Del Amo	7.43E+01	1.57E+00	1.01E+00	3.46E-01	1.82E-01	8.40E-02
I-110, Del Amo to 405	6.15E+01	1.30E+00	8.37E-01	2.87E-01	1.51E-01	6.95E-02
I-110, 405 to SR-91	1.30E+02	2.74E+00	1.77E+00	6.05E-01	3.18E-01	1.47E-01
I-710, Anaheim to PCH	1.84E+01	3.88E-01	2.50E-01	8.58E-02	4.51E-02	2.08E-02
I-710, PCH to Willow	3.96E+01	8.36E-01	5.39E-01	1.85E-01	9.71E-02	4.48E-02
I-710, Willow to 405	6.11E+01	1.29E+00	8.31E-01	2.85E-01	1.50E-01	6.90E-02
I-710, 405 to Del Amo	9.10E+01	1.92E+00	1.24E+00	4.24E-01	2.23E-01	1.03E-01
I-710, Del Amo to Long Beach Blvd Interchange	8.24E+01	1.74E+00	1.12E+00	3.84E-01	2.02E-01	9.31E-02
I-710, Long Beach Boulevard to SR-91	1.01E+02	2.13E+00	1.37E+00	4.71E-01	2.48E-01	1.14E-01
PCH, I110 to Alameda	3.21E+01	6.76E-01	4.36E-01	1.49E-01	7.86E-02	3.62E-02
PCH, Alameda to SR-103	4.93E+00	1.04E-01	6.71E-02	2.30E-02	1.21E-02	5.57E-03
PCH, SR-103 to I-710	7.74E+00	1.63E-01	1.05E-01	3.60E-02	1.90E-02	8.74E-03
Sepulveda, I-110 to Avalon	1.29E+01	2.73E-01	1.76E-01	6.03E-02	3.17E-02	1.46E-02
Sepulveda, Avalon to Alameda	1.95E+01	4.11E-01	2.65E-01	9.09E-02	4.78E-02	2.21E-02
Sepulveda, Alameda to ICTF	2.45E+00	5.16E-02	3.33E-02	1.14E-02	6.00E-03	2.77E-03
Sepulveda, ICTF to SR-103	4.81E-01	1.01E-02	6.54E-03	2.24E-03	1.18E-03	5.44E-04
Del Amo, I-110 to Wilmington	2.99E+01	6.30E-01	4.07E-01	1.39E-01	7.32E-02	3.38E-02
Del Amo, Wilminton to Alameda	1.73E+01	3.64E-01	2.35E-01	8.05E-02	4.23E-02	1.95E-02
Del Amo, Alameda to I-710	2.16E+01	4.56E-01	2.94E-01	1.01E-01	5.30E-02	2.45E-02
223rd Street, I-110 to Avalon	1.02E+01	2.14E-01	1.38E-01	4.74E-02	2.49E-02	1.15E-02
223rd Street, Avalon to Wilmington	7.36E+00	1.55E-01	1.00E-01	3.43E-02	1.80E-02	8.31E-03
223rd Street, Wilmington to Alameda	8.98E+00	1.89E-01	1.22E-01	4.19E-02	2.20E-02	1.02E-02
W Wardlow from Alameda to I-710	1.95E+01	4.10E-01	2.65E-01	9.06E-02	4.77E-02	2.20E-02

Table B-5
2030 Alternative 1
Annual Average Truck Emissions

	Length	Average Speed	Port AADT Trucks	SCAG AADT Trucks	Port LNG Trucks	Port Dsl / Alt Trucks	SCAG Gasoline Trucks	SCAG Diesel Trucks
Alternative 1, 2030	mile	mph	veh/day	veh/day	veh/day	veh/day	veh/day	veh/day
SR-47 Mainline, New Dock Ramps to Transition		55	35585	326	8818	26767	169	157
New Dock Ramps - Cerritos Channel (A1 Line)	0.24	55	35585	326	8818	26767	169	157
SB Cerritos Channel - Transition (G1 Line)	0.13	55	17792.5	163	4409	13384	85	78
NB Cerritos Channel - Transition (E1 Line)	0.15	55	17792.5	163	4409	13384	85	78
Mainline Transition to HF Ramps & SR-103		55	15449	295	2746	12703	153	142
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	0.23	55	7724.5	147.5	1373	6352	77	71
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	0.20	55	7724.5	147.5	1373	6352	77	71
Henry Ford Ramps	0.31	25	2651	136	637	2014	71	65
Henry Ford n/o Ramps to Alameda	0.68	25	7291	294	1152	6139	153	141
SR-47 Extension, HF Ramps to Alameda		50	20135	168	6073	14062	87	81
SB, 103 Split to Dominguex Channel (D1 Line)	0.70	50	10067.5	84	3037	7031	44	40
NB, 103 Split to Dominguex Channel (F1 Line)	0.69	50	10067.5	84	3037	7031	44	40
Dominguex Channel - Alameda (I1 Line)	0.83	50	20135	168	6073	14062	87	81
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.10	50	12798	159	2109	10689	83	76
SR-103 Anaheim to PCH	0.57	50	15192	294	2541	12651	153	141
SR-103 PCH to Sepulveda/Willow	1.02	50	9893	464	1788	8105	241	223
E and W Harry Bridges, Figueroa to start Alameda	1.44	45	5648	262	1315	4333	136	126
Alameda beginning (E Harry Bridges) to Anaheim	0.77	45	6680	656	2230	4450	340	316
Alameda Anaheim to Henry Ford	0.42	45	3932	690	1441	2491	358	332
Alameda, Henry Ford to PCH	0.34	45	8527	704	2217	6310	365	339
Alameda PCH to 405	2.27	45	26331	1845	7834	18497	958	887
Alameda 405 to del Amo	1.72	45	12397	1775	2953	9444	921	854
Alameda, del Amo to South Santa Fe Avenue	0.84	45	8964	1204	1873	7091	625	579
Alameda, South Santa Fe Avenue to SR-91	1.15	45	7052	941	1775	5277	488	453
I-110, "C" Street Interchange to Anaheim	0.49	65	17957	3310	5136	12821	1718	1592
I-110, Anaheim to PCH	0.80	65	18233	3724	5282	12951	1933	1791
1-110, PCH to Sepulveda	1.39	65	19172	5339	5590	13582	2771	2568
I-110, Sepulveda to Carson	1.56	65	17829	8014	5236	12593	4159	3855
I-110, Carson to Del Amo	1.02	65	17107	8337	5039	12068	4327	4010
I-110, Del Amo to 405	0.74	65	16544	9478	4176	12368	4919	4559
I-110, 405 to SR-91	1.09	65	14181	13565	4100	10081	7040	6525
I-710, Anaheim to PCH	0.50	65	64390	4243	15963	48427	2202	2041
I-710, PCH to Willow	1.01	65	65329	4540	16178	49151	2356	2184
I-710, Willow to 405	1.52	65	64978	4684	16087	48891	2431	2253
I-710, 405 to Del Amo	1.42	65	65306	7414	16839	48467	3848	3566
I-710, Del Amo to Long Beach Blvd Interchange	1.17	65	64177	8066	16550	47627	4186	3880
I-710, Long Beach Boulevard to SR-91	0.96	65	63776	11802	16431	47345	6125	5677
PCH, I110 to Alameda	2.38	50	3439	1215	801	2638	631	584
PCH, Alameda to SR-103	0.94	50	1032	652	147	885	338	314
PCH, SR-103 to I-710	0.98	50	8461	841	1273	7188	436	405
Sepulveda, I-110 to Avalon	1.37	40	584	799	120	464	415	384
Sepulveda, Avalon to Alameda	1.70	40	688	983	80	608	510	473
Sepulveda, Alameda to ICTF	0.67	40	2838	340	564	2274	176	164
Sepulveda, ICTF to SR-103	0.17	40	9893	271	1788	8105	141	130
Del Amo, I-110 to Wilmington	2.96	40	387	889	44	343	461	428
Del Amo, Wilmington to Alameda	0.77	40	1931	1961	615	1316	1018	943
Del Amo, Alameda to I-710	0.87	40	1274	2189	320	954	1136	1053
223rd Street, I-110 to Avalon	1.36	45	196	775	28	168	402	373
223rd Street, Avalon to Wilmington	1.23	45	103	590	22	81	306	284
223rd Street, Wilmington to Alameda	0.79	45	1776	1157	469	1307	600	557
W Wardlow from Alameda to I-710	1.30	45	6325	1426	332	5993	740	686

Table B-5
2030 Alternative 1
Annual Average Truck Emissions

	Port	Port	Port	Port	SCAG		Port	Port	Port	SCAG	
	LNG TOG	LNG PM10	LNG DPM	Dsl Exhst PM	Gasoline TOG	Dsl Exhst PM	LNG TOG	LNG PM10	LNG+DSL DPM	Gasoline TOG	Dsl Exhst PM
Alternative 1, 2030	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	lb/yr	lb/yr	lb/year	lb/year	lb/year
SR-47 Mainline, New Dock Ramps to Transition											
New Dock Ramps - Cerritos Channel (A1 Line)	0.489	0.111	0.006	0.076	0.021	0.060	832.686	189.792	403.1	0.7	1.8
SB Cerritos Channel - Transition (G1 Line)	0.489	0.111	0.006	0.076	0.021	0.060	225.519	51.402	109.2	0.2	0.5
NB Cerritos Channel - Transition (E1 Line)	0.489	0.111	0.006	0.076	0.021	0.060	260.214	59.310	126.0	0.2	0.6
Mainline Transition to HF Ramps & SR-103	0.489	0.111	0.006	0.076	0.021	0.060	0.000	0.000	0.0	0.0	0.0
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	0.489	0.111	0.006	0.076	0.021	0.060	124.251	28.320	90.9	0.3	0.8
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	0.489	0.111	0.006	0.076	0.021	0.060	108.044	24.626	79.0	0.3	0.7
Henry Ford Ramps	0.489	0.111	0.006	0.045	0.051	0.053	77.672	17.704	23.5	0.9	0.9
Henry Ford n/o Ramps to Alameda	0.489	0.111	0.006	0.045	0.051	0.053	308.220	70.252	154.4	4.3	4.1
SR-47 Extension, HF Ramps to Alameda	0.489	0.111	0.006	0.066	0.022	0.055	0.000	0.000	0.0	0.0	0.0
SB, 103 Split to Dominguex Channel (D1 Line)	0.489	0.111	0.006	0.066	0.022	0.055	836.345	190.626	272.6	0.5	1.2
NB, 103 Split to Dominguex Channel (F1 Line)	0.489	0.111	0.006	0.066	0.022	0.055	824.397	187.903	268.7	0.5	1.2
Dominguex Channel - Alameda (I1 Line)	0.489	0.111	0.006	0.066	0.022	0.055	1983.333	452.056	646.5	1.3	2.9
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	0.489	0.111	0.006	0.066	0.022	0.055	912.873	208.069	638.2	1.6	3.7
SR-103 Anaheim to PCH	0.489	0.111	0.006	0.066	0.022	0.055	569.920	129.900	391.5	1.5	3.5
SR-103 PCH to Sepulveda/Willow	0.489	0.111	0.006	0.066	0.022	0.055	717.415	163.518	449.7	4.3	10.0
E and W Harry Bridges, Figueroa to start Alameda	0.489	0.111	0.006	0.058	0.024	0.051	746.973	170.256	300.1	3.8	7.4
Alameda beginning (E Harry Bridges) to Anaheim	0.489	0.111	0.006	0.058	0.024	0.051	675.441	153.951	167.6	5.1	9.9
Alameda Anaheim to Henry Ford	0.489	0.111	0.006	0.058	0.024	0.051	239.219	54.524	51.8	2.9	5.7
Alameda, Henry Ford to PCH	0.489	0.111	0.006	0.058	0.024	0.051	299.755	68.322	104.5	2.4	4.7
Alameda PCH to 405	0.489	0.111	0.006	0.058	0.024	0.051	6986.735	1592.467	2035.6	41.9	81.9
Alameda 405 to del Amo	0.489	0.111	0.006	0.058	0.024	0.051	1999.901	455.832	780.6	30.6	59.8
Alameda, del Amo to South Santa Fe Avenue	0.489	0.111	0.006	0.058	0.024	0.051	619.477	141.196	284.9	10.1	19.8
Alameda, South Santa Fe Avenue to SR-91	0.489	0.111	0.006	0.058	0.024	0.051	805.492	183.594	292.9	10.9	21.3
I-110, "C" Street Interchange to Anaheim	0.489	0.111	0.006	0.101	0.021	0.074	994.057	226.573	523.2	14.3	46.6
I-110, Anaheim to PCH	0.489	0.111	0.006	0.101	0.021	0.074	1668.945	380.398	863.3	26.2	85.7
1-110, PCH to Sepulveda	0.489	0.111	0.006	0.101	0.021	0.074	3048.738	694.890	1563.1	64.9	212.1
I-110, Sepulveda to Carson	0.489	0.111	0.006	0.101	0.021	0.074	3208.600	731.327	1628.4	109.5	357.6
I-110, Carson to Del Amo	0.489	0.111	0.006	0.101	0.021	0.074	2025.740	461.721	1023.9	74.7	244.1
I-110, Del Amo to 405	0.489	0.111	0.006	0.101	0.021	0.074	1217.374	277.473	757.6	61.6	201.2
I-110, 405 to SR-91	0.489	0.111	0.006	0.101	0.021	0.074	1762.883	401.809	914.4	130.0	424.8
I-710, Anaheim to PCH	0.489	0.111	0.006	0.101	0.021	0.074	3136.973	715.002	1998.5	18.6	60.7
I-710, PCH to Willow	0.489	0.111	0.006	0.101	0.021	0.074	6399.478	1458.616	4083.0	40.0	130.8
I-710, Willow to 405	0.489	0.111	0.006	0.101	0.021	0.074	9640.908	2197.426	6153.1	62.6	204.4
I-710, 405 to Del Amo	0.489	0.111	0.006	0.101	0.021	0.074	9404.941	2143.642	5690.5	92.3	301.5
I-710, Del Amo to Long Beach Blvd Interchange	0.489	0.111	0.006	0.101	0.021	0.074	7645.364	1742.587	4625.0	83.1	271.3
I-710, Long Beach Boulevard to SR-91	0.489	0.111	0.006	0.101	0.021	0.074	6212.539	1416.007	3763.0	99.5	325.0
PCH, I110 to Alameda	0.489	0.111	0.006	0.066	0.022	0.055	749.566	170.847	343.8	26.6	61.0
PCH, Alameda to SR-103	0.489	0.111	0.006	0.066	0.022	0.055	54.382	12.395	45.1	5.6	12.9
PCH, SR-103 to I-710	0.489	0.111	0.006	0.066	0.022	0.055	491.569	112.042	382.3	7.6	17.4
Sepulveda, I-110 to Avalon	0.489	0.111	0.006	0.052	0.027	0.049	64.640	14.733	27.4	12.3	20.6
Sepulveda, Avalon to Alameda	0.489	0.111	0.006	0.052	0.027	0.049	53.743	12.249	43.8	18.8	31.4
Sepulveda, Alameda to ICTF	0.489	0.111	0.006	0.052	0.027	0.049	149.664	34.112	66.0	2.6	4.3
Sepulveda, ICTF to SR-103	0.489	0.111	0.006	0.052	0.027	0.049	120.546	27.476	59.6	0.5	0.9
Del Amo, I-110 to Wilmington	0.489	0.111	0.006	0.052	0.027	0.049	51.225	11.676	43.1	29.7	49.5
Del Amo, Wilmington to Alameda	0.489	0.111	0.006	0.052	0.027	0.049	185.305	42.236	44.4	16.9	28.2
Del Amo, Alameda to I-710	0.489	0.111	0.006	0.052	0.027	0.049	109.670	24.997	36.1	21.5	35.9
223rd Street, I-110 to Avalon	0.489	0.111	0.006	0.058	0.024	0.051	15.231	3.472	10.8	10.6	20.7
223rd Street, Avalon to Wilmington	0.489	0.111	0.006	0.058	0.024	0.051	10.800	2.462	4.7	7.2	14.2
223rd Street, Wilmington to Alameda	0.489	0.111	0.006	0.058	0.024	0.051	145.667	33.201	49.7	9.2	17.9
W Wardlow from Alameda to I-710	0.489	0.111	0.006	0.058	0.024	0.051	169.593	38.655	364.7	18.6	36.3

Table B-5
2030 Alternative 1
Annual Average Truck Emissions

	Total Average Annual Toxic Emissions from Trucks																	
	DPM	Acet-aldehyde	Acrolein	Benzene	Bromine	1,3-Butadiene	Chlorine	Chromium	Copper	Form-aldehyde	n-Hexane	Manganese	Nickel	Propylene	Sulfates	Toluene	Xylenes	Zinc
	9901	75070	107028	71432	7726956	106990	7782505	18540299	7440508	50000	110543	7439965	7440020	115071	9960	108883	1330207	7440666
Alternative 1, 2030	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to Transition																		
New Dock Ramps - Cerritos Channel (A1 Line)	4.05E+02	2.51E-01	7.75E-04	9.30E-01	9.49E-02	3.20E-03	1.33E+01	4.74E-03	9.49E-02	6.75E+00	1.67E-01	9.49E-02	9.49E-02	1.41E+01	8.54E+01	3.33E-01	1.67E-01	9.49E-02
SB Cerritos Channel - Transition (G1 Line)	1.10E+02	6.81E-02	2.10E-04	2.52E-01	2.57E-02	8.66E-04	3.60E+00	1.29E-03	2.57E-02	1.83E+00	4.51E-02	2.57E-02	2.57E-02	3.81E+00	2.31E+01	9.02E-02	4.51E-02	2.57E-02
NB Cerritos Channel - Transition (E1 Line)	1.27E+02	7.86E-02	2.42E-04	2.91E-01	2.97E-02	9.99E-04	4.15E+00	1.48E-03	2.97E-02	2.11E+00	5.20E-02	2.97E-02	2.97E-02	4.40E+00	2.67E+01	1.04E-01	5.20E-02	2.97E-02
Mainline Transition to HF Ramps & SR-103	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	9.17E+01	3.80E-02	3.36E-04	1.43E-01	1.42E-02	1.39E-03	1.98E+00	7.08E-04	1.42E-02	1.01E+00	2.49E-02	1.42E-02	1.42E-02	2.10E+00	1.27E+01	4.97E-02	2.49E-02	1.42E-02
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	7.97E+01	3.30E-02	2.92E-04	1.24E-01	1.23E-02	1.21E-03	1.72E+00	6.16E-04	1.23E-02	8.79E-01	2.16E-02	1.23E-02	1.23E-02	1.83E+00	1.11E+01	4.32E-02	2.16E-02	1.23E-02
Henry Ford Ramps	2.43E+01	2.55E-02	1.01E-03	1.04E-01	8.85E-03	4.18E-03	1.24E+00	4.43E-04	8.85E-03	6.41E-01	1.55E-02	8.85E-03	8.85E-03	1.31E+00	7.97E+00	3.11E-02	1.55E-02	8.85E-03
Henry Ford n/o Ramps to Alameda	1.58E+02	1.03E-01	4.81E-03	4.29E-01	3.51E-02	1.98E-02	4.92E+00	1.76E-03	3.51E-02	2.55E+00	6.16E-02	3.51E-02	3.51E-02	5.21E+00	3.16E+01	1.23E-01	6.16E-02	3.51E-02
SR-47 Extension, HF Ramps to Alameda	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB, 103 Split to Dominguex Channel (D1 Line)	2.74E+02	2.52E-01	6.10E-04	9.31E-01	9.53E-02	2.52E-03	1.33E+01	4.77E-03	9.53E-02	6.78E+00	1.67E-01	9.53E-02	9.53E-02	1.41E+01	8.58E+01	3.35E-01	1.67E-01	9.53E-02
NB, 103 Split to Dominguex Channel (F1 Line)	2.70E+02	2.49E-01	6.02E-04	9.18E-01	9.40E-02	2.48E-03	1.32E+01	4.70E-03	9.40E-02	6.68E+00	1.65E-01	9.40E-02	9.40E-02	1.39E+01	8.46E+01	3.30E-01	1.65E-01	9.40E-02
Dominguex Channel - Alameda (I1 Line)	6.49E+02	5.98E-01	1.45E-03	2.21E+00	2.26E-01	5.97E-03	3.16E+01	1.13E-02	2.26E-01	1.61E+01	3.97E-01	2.26E-01	2.26E-01	3.35E+01	2.03E+02	7.93E-01	3.97E-01	2.26E-01
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	6.42E+02	2.78E-01	1.82E-03	1.04E+00	1.04E-01	7.49E-03	1.46E+01	5.20E-03	1.04E-01	7.42E+00	1.83E-01	1.04E-01	1.04E-01	1.54E+01	9.36E+01	3.65E-01	1.83E-01	1.04E-01
SR-103 Anaheim to PCH	3.95E+02	1.75E-01	1.74E-03	6.59E-01	6.50E-02	7.17E-03	9.09E+00	3.25E-03	6.50E-02	4.64E+00	1.14E-01	6.50E-02	6.50E-02	9.63E+00	5.85E+01	2.28E-01	1.14E-01	6.50E-02
SR-103 PCH to Sepulveda/Willow	4.60E+02	2.26E-01	4.91E-03	8.81E-01	8.18E-02	2.03E-02	1.14E+01	4.09E-03	8.18E-02	5.87E+00	1.43E-01	8.18E-02	8.18E-02	1.21E+01	7.36E+01	2.87E-01	1.43E-01	8.18E-02
E and W Harry Bridges, Figueroa to start Alameda	3.08E+02	2.33E-01	4.28E-03	9.02E-01	8.51E-02	1.77E-02	1.19E+01	4.26E-03	8.51E-02	6.10E+00	1.49E-01	8.51E-02	8.51E-02	1.26E+01	7.66E+01	2.99E-01	1.49E-01	8.51E-02
Alameda beginning (E Harry Bridges) to Anaheim	1.77E+02	2.15E-01	5.72E-03	8.50E-01	7.70E-02	2.36E-02	1.08E+01	3.85E-03	7.70E-02	5.54E+00	1.35E-01	7.70E-02	7.70E-02	1.14E+01	6.93E+01	2.70E-01	1.35E-01	7.70E-02
Alameda Anaheim to Henry Ford	5.75E+01	7.89E-02	3.30E-03	3.25E-01	2.73E-02	1.36E-02	3.82E+00	1.36E-03	2.73E-02	1.98E+00	4.78E-02	2.73E-02	2.73E-02	4.04E+00	2.45E+01	9.57E-02	4.78E-02	2.73E-02
Alameda, Henry Ford to PCH	1.09E+02	9.59E-02	2.74E-03	3.81E-01	3.42E-02	1.13E-02	4.78E+00	1.71E-03	3.42E-02	2.46E+00	6.00E-02	3.42E-02	3.42E-02	5.07E+00	3.07E+01	1.20E-01	6.00E-02	3.42E-02
Alameda PCH to 405	2.12E+03	2.20E+00	4.74E-02	8.57E+00	7.96E-01	1.95E-01	1.11E+02	3.98E-02	7.96E-01	5.72E+01	1.40E+00	7.96E-01	7.96E-01	1.18E+02	7.17E+02	2.79E+00	1.40E+00	7.96E-01
Alameda 405 to del Amo	8.40E+02	6.75E-01	3.46E-02	2.85E+00	2.28E-01	1.43E-01	3.19E+01	1.14E-02	2.28E-01	1.66E+01	4.00E-01	2.28E-01	2.28E-01	3.38E+01	2.05E+02	8.00E-01	4.00E-01	2.28E-01
Alameda, del Amo to South Santa Fe Avenue	3.05E+02	2.11E-01	1.15E-02	8.95E-01	7.06E-02	4.73E-02	9.88E+00	3.53E-03	7.06E-02	5.16E+00	1.24E-01	7.06E-02	7.06E-02	1.05E+01	6.35E+01	2.48E-01	1.24E-01	7.06E-02
Alameda, South Santa Fe Avenue to SR-91	3.14E+02	2.68E-01	1.23E-02	1.12E+00	9.18E-02	5.07E-02	1.29E+01	4.59E-03	9.18E-02	6.67E+00	1.61E-01	9.18E-02	9.18E-02	1.36E+01	8.26E+01	3.22E-01	1.61E-01	9.18E-02
I-110, "C" Street Interchange to Anaheim	5.70E+02	3.33E-01	1.61E-02	1.39E+00	1.13E-01	6.65E-02	1.59E+01	5.66E-03	1.13E-01	8.25E+00	1.99E-01	1.13E-01	1.13E-01	1.68E+01	1.02E+02	3.98E-01	1.99E-01	1.13E-01
I-110, Anaheim to PCH	9.49E+02	5.65E-01	2.96E-02	2.39E+00	1.90E-01	1.22E-01	2.66E+01	9.51E-03	1.90E-01	1.39E+01	3.34E-01	1.90E-01	1.90E-01	2.82E+01	1.71E+02	6.68E-01	3.34E-01	1.90E-01
1-110, PCH to Sepulveda	1.78E+03	1.07E+00	7.33E-02	4.72E+00	3.47E-01	3.02E-01	4.86E+01	1.74E-02	3.47E-01	2.56E+01	6.10E-01	3.47E-01	3.47E-01	5.15E+01	3.13E+02	1.22E+00	6.10E-01	3.47E-01
I-110, Sepulveda to Carson	1.99E+03	1.23E+00	1.24E-01	5.84E+00	3.66E-01	5.10E-01	5.12E+01	1.83E-02	3.66E-01	2.75E+01	6.42E-01	3.66E-01	3.66E-01	5.42E+01	3.29E+02	1.28E+00	6.42E-01	3.66E-01
I-110, Carson to Del Amo	1.27E+03	7.91E-01	8.44E-02	3.80E+00	2.31E-01	3.48E-01	3.23E+01	1.15E-02	2.31E-01	1.74E+01	4.05E-01	2.31E-01	2.31E-01	3.42E+01	2.08E+02	8.10E-01	4.05E-01	2.31E-01
I-110, Del Amo to 405	9.59E+02	5.16E-01	6.96E-02	2.64E+00	1.39E-01	2.87E-01	1.94E+01	6.94E-03	1.39E-01	1.07E+01	2.43E-01	1.39E-01	1.39E-01	2.06E+01	1.25E+02	4.87E-01	2.43E-01	1.39E-01
I-110, 405 to SR-91	1.34E+03	8.47E-01	1.47E-01	4.68E+00	2.01E-01	6.06E-01	2.81E+01	1.00E-02	2.01E-01	1.60E+01	3.53E-01	2.01E-01	2.01E-01	2.98E+01	1.81E+02	7.05E-01	3.53E-01	2.01E-01
I-710, Anaheim to PCH	2.06E+03	9.87E-01	2.10E-02	3.84E+00	3.58E-01	8.66E-02	5.01E+01	1.79E-02	3.58E-01	2.57E+01	6.27E-01	3.58E-01	3.58E-01	5.30E+01	3.22E+02	1.25E+00	6.27E-01	3.58E-01
I-710, PCH to Willow	4.21E+03	2.02E+00	4.52E-02	7.88E+00	7.29E-01	1.86E-01	1.02E+02	3.65E-02	7.29E-01	5.24E+01	1.28E+00	7.29E-01	7.29E-01	1.08E+02	6.56E+02	2.56E+00	1.28E+00	7.29E-01
I-710, Willow to 405	6.36E+03	3.05E+00	7.07E-02	1.19E+01	1.10E+00	2.92E-01	1.54E+02	5.49E-02	1.10E+00	7.89E+01	1.93E+00	1.10E+00	1.10E+00	1.63E+02	9.89E+02	3.86E+00	1.93E+00	1.10E+00
I-710, 405 to Del Amo	5.99E+03	3.05E+00	1.04E-01	1.23E+01	1.07E+00	4.30E-01	1.50E+02	5.36E-02	1.07E+00	7.74E+01	1.88E+00	1.07E+00	1.07E+00	1.59E+02	9.65E+02	3.76E+00	1.88E+00	1.07E+00
I-710, Del Amo to Long Beach Blvd Interchange	4.90E+03	2.50E+00	9.39E-02	1.02E+01	8.71E-01	3.87E-01	1.22E+02	4.36E-02	8.71E-01	6.31E+01	1.53E+00	8.71E-01	8.71E-01	1.29E+02	7.84E+02	3.06E+00	1.53E+00	8.71E-01
I-710, Long Beach Boulevard to SR-91	4.09E+03	2.11E+00	1.12E-01	8.93E+00	7.08E-01	4.63E-01	9.91E+01	3.54E-02	7.08E-01	5.17E+01	1.24E+00	7.08E-01	7.08E-01	1.05E+02	6.37E+02	2.49E+00	1.24E+00	7.08E-01
PCH, I110 to Alameda	4.05E+02	2.90E-01	3.00E-02	1.38E+00	8.54E-02	1.24E-01	1.20E+01	4.27E-03	8.54E-02	6.43E+00	1.50E-01	8.54E-02	8.54E-02	1.27E+01	7.69E+01	3.00E-01	1.50E-01	8.54E-02
PCH, Alameda to SR-103	5.81E+01	3.01E-02	6.37E-03	1.79E-01	6.20E-03	2.63E-02	8.68E-01	3.10E-04	6.20E-03	5.17E-01	1.09E-02	6.20E-03	6.20E-03	9.19E-01	5.58E+00	2.18E-02	1.09E-02	6.20E-03
PCH, SR-103 to I-710	4.00E+02	1.66E-01	8.57E-03	7.01E-01	5.60E-02	3.53E-02	7.84E+00	2.80E-03	5.60E-02	4.08E+00	9.83E-02	5.60E-02	5.60E-02	8.31E+00	5.04E+01	1.97E-01	9.83E-02	5.60E-02
Sepulveda, I-110 to Avalon	4.79E+01	4.96E-02	1.39E-02	3.31E-01	7.37E-03	5.75E-02	1.03E+00	3.68E-04	7.37E-03	6.91E-01	1.29E-02	7.37E-03	7.37E-03	1.09E+00	6.63E+00	2.59E-02	1.29E-02	7.37E-03
Sepulveda, Avalon to Alameda	7.53E+01	6.23E-02	2.13E-02	4.56E-01	6.12E-03	8.77E-02	8.57E-01	3.06E-04	6.12E-03	6.91E-01	1.07E-02	6.12E-03	6.12E-03	9.08E-01	5.51E+00	2.15E-02	1.07E-02	6.12E-03
Sepulveda, Alameda to ICTF	7.03E+01	5.12E-02	2.92E-03	2.19E-01	1.71E-02	1.20E-02	2.39E+00	8.53E-04	1.71E-02	1.25E+00	2.99E-02	1.71E-02	1.71E-02	2.53E+00	1.54E+01	5.99E-02	2.99E-02	1.71E-02
Sepulveda, ICTF to SR-103	6.04E+01	3.74E-02	5.92E-04	1.44E-01	1.37E-02	2.44E-03	1.92E+00	6.87E-04	1.37E-02	9.84E-01	2.41E-02	1.37E-02	1.37E-02	2.04E+00	1.24E+01	4.82E-02	2.41E-02	1.37E-02
Del Amo, I-110 to Wilmington	9.26E+01	8.80E-02	3.35E-02	6.82E-01	5.84E-03	1.38E-01	8.17E-01	2.92E-04	5.84E-03	8.18E-01	1.02E-02	5.84E-03	5.84E-03	8.66E-01	5.25E+00	2.05E-02	1.02E-02	5.84E-03
Del Amo, Wilmington to Alameda	7.26E+01	9.71E-02	1.91E-02	5.61E-01	2.11E-02	7.89E-02	2.96E+00	1.06E-03	2.11E-02	1.73E+00	3.71E-02	2.11E-02	2.11E-02	3.13E+00	1.90E+01	7.41E-02	3.71E-02	2.11E-02
Del Amo, Alameda to I-710	7.21E+01	8.56E-02	2.43E-02	5.74E-01	1.25E-02	1.00E-01	1.75E+00	6.25E-04	1.25E-02	1.18E+00	2.19E-02	1.25E-02	1.25E-02	1.85E+00	1.12E+01	4.39E-02	2.19E-02	1.25E-02
223rd Street, I-110 to Avalon	3.15E+01	3.05E-02	1.20E-02	2.40E-01	1.74E-03	4.93E-02	2.43E-01	8.68E-05	1.74E-03	2.67E-01	3.05E-03	1.74E-03	1.74E-03	2.57E-01	1.56E+00	6.09E-03	3.05E-03	1.74E-03
223rd Street, Avalon to Wilmington	1.89E+01	2.10E-02	8.19E-03	1.65E-01	1.23E-03	3.38E-02	1.72E-01	6.15E-05	1.23E-03	1.86E-01	2.16E-03	1.23E-03	1.23E-03	1.83E-01	1.11E+00	4.32E-03	2.16E-03	1.23E-03
223rd Street, Wilmington to Alameda	6.76E+01	6.61E-02	1.03E-02	3.53E-01	1.66E-02	4.26E-02	2.32E+00	8.30E-04	1.66E-02	1.30E+00	2.91E-02	1.66E-02	1.66E-02	2.46E+00	1.49E+01	5.83E-02	2.91E-02	1.66E-02
W Wardlow from Alameda to I-710	4.01E+02	9.64E-02	2.10E-02	5.78E-01	1.93E-02	8.66E-02	2.71E+00	9.66E-04	1.93E-02	1.63E+00	3.39E-02	1.93E-02	1.93E-02	2.87E+00	1.74E+01	6.78E-02	3.39E-02	1.93E-02

Table B-5
2030 Alternative 1
Annual Average Truck Emissions

	Port - LNG Emissions									Port - LNG Emissions								
	TOG	Acetaldehyde	Benzene	Ethylbenzene	Formaldehyde	n-Hexane	Propylene	Toluene	Xylenes	PM10	Bromine	Chlorine	Chromium (hex)	Copper	Manganese	Nickel	Sulfates	Zinc
		75070	71432	100414	50000	110543	115071	108883	1330207		7726956	7782505	18540299	7440508	7439965	7440020	9960	7440666
Alternative 1, 2030	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to Transition																		
New Dock Ramps - Cerritos Channel (A1 Line)	8.33E+02	2.50E-01	9.16E-01	8.33E-02	6.74E+00	1.67E-01	1.41E+01	3.33E-01	1.67E-01	1.90E+02	9.49E-02	1.33E+01	4.74E-03	9.49E-02	9.49E-02	9.49E-02	8.54E+01	9.49E-02
SB Cerritos Channel - Transition (G1 Line)	2.26E+02	6.77E-02	2.48E-01	2.26E-02	1.83E+00	4.51E-02	3.81E+00	9.02E-02	4.51E-02	5.14E+01	2.57E-02	3.60E+00	1.29E-03	2.57E-02	2.57E-02	2.57E-02	2.31E+01	2.57E-02
NB Cerritos Channel - Transition (E1 Line)	2.60E+02	7.81E-02	2.86E-01	2.60E-02	2.11E+00	5.20E-02	4.40E+00	1.04E-01	5.20E-02	5.93E+01	2.97E-02	4.15E+00	1.48E-03	2.97E-02	2.97E-02	2.97E-02	2.67E+01	2.97E-02
Mainline Transition to HF Ramps & SR-103	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	1.24E+02	3.73E-02	1.37E-01	1.24E-02	1.01E+00	2.49E-02	2.10E+00	4.97E-02	2.49E-02	2.83E+01	1.42E-02	1.98E+00	7.08E-04	1.42E-02	1.42E-02	1.42E-02	1.27E+01	1.42E-02
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	1.08E+02	3.24E-02	1.19E-01	1.08E-02	8.75E-01	2.16E-02	1.83E+00	4.32E-02	2.16E-02	2.46E+01	1.23E-02	1.72E+00	6.16E-04	1.23E-02	1.23E-02	1.23E-02	1.11E+01	1.23E-02
Henry Ford Ramps	7.77E+01	2.33E-02	8.54E-02	7.77E-03	6.29E-01	1.55E-02	1.31E+00	3.11E-02	1.55E-02	1.77E+01	8.85E-03	1.24E+00	4.43E-04	8.85E-03	8.85E-03	8.85E-03	7.97E+00	8.85E-03
Henry Ford n/o Ramps to Alameda	3.08E+02	9.25E-02	3.39E-01	3.08E-02	2.50E+00	6.16E-02	5.21E+00	1.23E-01	6.16E-02	7.03E+01	3.51E-02	4.92E+00	1.76E-03	3.51E-02	3.51E-02	3.51E-02	3.16E+01	3.51E-02
SR-47 Extension, HF Ramps to Alameda	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB, 103 Split to Dominguex Channel (D1 Line)	8.36E+02	2.51E-01	9.20E-01	8.36E-02	6.77E+00	1.67E-01	1.41E+01	3.35E-01	1.67E-01	1.91E+02	9.53E-02	1.33E+01	4.77E-03	9.53E-02	9.53E-02	9.53E-02	8.58E+01	9.53E-02
NB, 103 Split to Dominguex Channel (F1 Line)	8.24E+02	2.47E-01	9.07E-01	8.24E-02	6.68E+00	1.65E-01	1.39E+01	3.30E-01	1.65E-01	1.88E+02	9.40E-02	1.32E+01	4.70E-03	9.40E-02	9.40E-02	9.40E-02	8.46E+01	9.40E-02
Dominguex Channel - Alameda (I1 Line)	1.98E+03	5.95E-01	2.18E+00	1.98E-01	1.61E+01	3.97E-01	3.35E+01	7.93E-01	3.97E-01	4.52E+02	2.26E-01	3.16E+01	1.13E-02	2.26E-01	2.26E-01	2.26E-01	2.03E+02	2.26E-01
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	9.13E+02	2.74E-01	1.00E+00	9.13E-02	7.39E+00	1.83E-01	1.54E+01	3.65E-01	1.83E-01	2.08E+02	1.04E-01	1.46E+01	5.20E-03	1.04E-01	1.04E-01	1.04E-01	9.36E+01	1.04E-01
SR-103 Anaheim to PCH	5.70E+02	1.71E-01	6.27E-01	5.70E-02	4.62E+00	1.14E-01	9.63E+00	2.28E-01	1.14E-01	1.30E+02	6.50E-02	9.09E+00	3.25E-03	6.50E-02	6.50E-02	6.50E-02	5.85E+01	6.50E-02
SR-103 PCH to Sepulveda/Willow	7.17E+02	2.15E-01	7.89E-01	7.17E-02	5.81E+00	1.43E-01	1.21E+01	2.87E-01	1.43E-01	1.64E+02	8.18E-02	1.14E+01	4.09E-03	8.18E-02	8.18E-02	8.18E-02	7.36E+01	8.18E-02
E and W Harry Bridges, Figueroa to start Alameda	7.47E+02	2.24E-01	8.22E-01	7.47E-02	6.05E+00	1.49E-01	1.26E+01	2.99E-01	1.49E-01	1.70E+02	8.51E-02	1.19E+01	4.26E-03	8.51E-02	8.51E-02	8.51E-02	7.66E+01	8.51E-02
Alameda beginning (E Harry Bridges) to Anaheim	6.75E+02	2.03E-01	7.43E-01	6.75E-02	5.47E+00	1.35E-01	1.14E+01	2.70E-01	1.35E-01	1.54E+02	7.70E-02	1.08E+01	3.85E-03	7.70E-02	7.70E-02	7.70E-02	6.93E+01	7.70E-02
Alameda Anaheim to Henry Ford	2.39E+02	7.18E-02	2.63E-01	2.39E-02	1.94E+00	4.78E-02	4.04E+00	9.57E-02	4.78E-02	5.45E+01	2.73E-02	3.82E+00	1.36E-03	2.73E-02	2.73E-02	2.73E-02	2.45E+01	2.73E-02
Alameda, Henry Ford to PCH	3.00E+02	8.99E-02	3.30E-01	3.00E-02	2.43E+00	6.00E-02	5.07E+00	1.20E-01	6.00E-02	6.83E+01	3.42E-02	4.78E+00	1.71E-03	3.42E-02	3.42E-02	3.42E-02	3.07E+01	3.42E-02
Alameda PCH to 405	6.99E+03	2.10E+00	7.69E+00	6.99E-01	5.66E+01	1.40E+00	1.18E+02	2.79E+00	1.40E+00	1.59E+03	7.96E-01	1.11E+02	3.98E-02	7.96E-01	7.96E-01	7.96E-01	7.17E+02	7.96E-01
Alameda 405 to del Amo	2.00E+03	6.00E-01	2.20E+00	2.00E-01	1.62E+01	4.00E-01	3.38E+01	8.00E-01	4.00E-01	4.56E+02	2.28E-01	3.19E+01	1.14E-02	2.28E-01	2.28E-01	2.28E-01	2.05E+02	2.28E-01
Alameda, del Amo to South Santa Fe Avenue	6.19E+02	1.86E-01	6.81E-01	6.19E-02	5.02E+00	1.24E-01	1.05E+01	2.48E-01	1.24E-01	1.41E+02	7.06E-02	9.88E+00	3.53E-03	7.06E-02	7.06E-02	7.06E-02	6.35E+01	7.06E-02
Alameda, South Santa Fe Avenue to SR-91	8.05E+02	2.42E-01	8.86E-01	8.05E-02	6.52E+00	1.61E-01	1.36E+01	3.22E-01	1.61E-01	1.84E+02	9.18E-02	1.29E+01	4.59E-03	9.18E-02	9.18E-02	9.18E-02	8.26E+01	9.18E-02
I-110, "C" Street Interchange to Anaheim	9.94E+02	2.98E-01	1.09E+00	9.94E-02	8.05E+00	1.99E-01	1.68E+01	3.98E-01	1.99E-01	2.27E+02	1.13E-01	1.59E+01	5.66E-03	1.13E-01	1.13E-01	1.13E-01	1.02E+02	1.13E-01
I-110, Anaheim to PCH	1.67E+03	5.01E-01	1.84E+00	1.67E-01	1.35E+01	3.34E-01	2.82E+01	6.68E-01	3.34E-01	3.80E+02	1.90E-01	2.66E+01	9.51E-03	1.90E-01	1.90E-01	1.90E-01	1.71E+02	1.90E-01
1-110, PCH to Sepulveda	3.05E+03	9.15E-01	3.35E+00	3.05E-01	2.47E+01	6.10E-01	5.15E+01	1.22E+00	6.10E-01	6.95E+02	3.47E-01	4.86E+01	1.74E-02	3.47E-01	3.47E-01	3.47E-01	3.13E+02	3.47E-01
I-110, Sepulveda to Carson	3.21E+03	9.63E-01	3.53E+00	3.21E-01	2.60E+01	6.42E-01	5.42E+01	1.28E+00	6.42E-01	7.31E+02	3.66E-01	5.12E+01	1.83E-02	3.66E-01	3.66E-01	3.66E-01	3.29E+02	3.66E-01
I-110, Carson to Del Amo	2.03E+03	6.08E-01	2.23E+00	2.03E-01	1.64E+01	4.05E-01	3.42E+01	8.10E-01	4.05E-01	4.62E+02	2.31E-01	3.23E+01	1.15E-02	2.31E-01	2.31E-01	2.31E-01	2.08E+02	2.31E-01
I-110, Del Amo to 405	1.22E+03	3.65E-01	1.34E+00	1.22E-01	9.86E+00	2.43E-01	2.06E+01	4.87E-01	2.43E-01	2.77E+02	1.39E-01	1.94E+01	6.94E-03	1.39E-01	1.39E-01	1.39E-01	1.25E+02	1.39E-01
I-110, 405 to SR-91	1.76E+03	5.29E-01	1.94E+00	1.76E-01	1.43E+01	3.53E-01	2.98E+01	7.05E-01	3.53E-01	4.02E+02	2.01E-01	2.81E+01	1.00E-02	2.01E-01	2.01E-01	2.01E-01	1.81E+02	2.01E-01
I-710, Anaheim to PCH	3.14E+03	9.41E-01	3.45E+00	3.14E-01	2.54E+01	6.27E-01	5.30E+01	1.25E+00	6.27E-01	7.15E+02	3.58E-01	5.01E+01	1.79E-02	3.58E-01	3.58E-01	3.58E-01	3.22E+02	3.58E-01
I-710, PCH to Willow	6.40E+03	1.92E+00	7.04E+00	6.40E-01	5.18E+01	1.28E+00	1.08E+02	2.56E+00	1.28E+00	1.46E+03	7.29E-01	1.02E+02	3.65E-02	7.29E-01	7.29E-01	7.29E-01	6.56E+02	7.29E-01
I-710, Willow to 405	9.64E+03	2.89E+00	1.06E+01	9.64E-01	7.81E+01	1.93E+00	1.63E+02	3.86E+00	1.93E+00	2.20E+03	1.10E+00	1.54E+02	5.49E-02	1.10E+00	1.10E+00	1.10E+00	9.89E+02	1.10E+00
I-710, 405 to Del Amo	9.40E+03	2.82E+00	1.03E+01	9.40E-01	7.62E+01	1.88E+00	1.59E+02	3.76E+00	1.88E+00	2.14E+03	1.07E+00	1.50E+02	5.36E-02	1.07E+00	1.07E+00	1.07E+00	9.65E+02	1.07E+00
I-710, Del Amo to Long Beach Blvd Interchange	7.65E+03	2.29E+00	8.41E+00	7.65E-01	6.19E+01	1.53E+00	1.29E+02	3.06E+00	1.53E+00	1.74E+03	8.71E-01	1.22E+02	4.36E-02	8.71E-01	8.71E-01	8.71E-01	7.84E+02	8.71E-01
I-710, Long Beach Boulevard to SR-91	6.21E+03	1.86E+00	6.83E+00	6.21E-01	5.03E+01	1.24E+00	1.05E+02	2.49E+00	1.24E+00	1.42E+03	7.08E-01	9.91E+01	3.54E-02	7.08E-01	7.08E-01	7.08E-01	6.37E+02	7.08E-01
PCH, I110 to Alameda	7.50E+02	2.25E-01	8.25E-01	7.50E-02	6.07E+00	1.50E-01	1.27E+01	3.00E-01	1.50E-01	1.71E+02	8.54E-02	1.20E+01	4.27E-03	8.54E-02	8.54E-02	8.54E-02	7.69E+01	8.54E-02
PCH, Alameda to SR-103	5.44E+01	1.63E-02	5.98E-02	5.44E-03	4.40E-01	1.09E-02	9.19E-01	2.18E-02	1.09E-02	1.24E+01	6.20E-03	8.68E-01	3.10E-04	6.20E-03	6.20E-03	6.20E-03	5.58E+00	6.20E-03
PCH, SR-103 to I-710	4.92E+02	1.47E-01	5.41E-01	4.92E-02	3.98E+00	9.83E-02	8.31E+00	1.97E-01	9.83E-02	1.12E+02	5.60E-02	7.84E+00	2.80E-03	5.60E-02	5.60E-02	5.60E-02	5.04E+01	5.60E-02
Sepulveda, I-110 to Avalon	6.46E+01	1.94E-02	7.11E-02	6.46E-03	5.24E-01	1.29E-02	1.09E+00	2.59E-02	1.29E-02	1.47E+01	7.37E-03	1.03E+00	3.68E-04	7.37E-03	7.37E-03	7.37E-03	6.63E+00	7.37E-03
Sepulveda, Avalon to Alameda	5.37E+01	1.61E-02	5.91E-02	5.37E-03	4.35E-01	1.07E-02	9.08E-01	2.15E-02	1.07E-02	1.22E+01	6.12E-03	8.57E-01	3.06E-04	6.12E-03	6.12E-03	6.12E-03	5.51E+00	6.12E-03
Sepulveda, Alameda to ICTF	1.50E+02	4.49E-02	1.65E-01	1.50E-02	1.21E+00	2.99E-02	2.53E+00	5.99E-02	2.99E-02	3.41E+01	1.71E-02	2.39E+00	8.53E-04	1.71E-02	1.71E-02	1.71E-02	1.54E+01	1.71E-02
Sepulveda, ICTF to SR-103	1.21E+02	3.62E-02	1.33E-01	1.21E-02	9.76E-01	2.41E-02	2.04E+00	4.82E-02	2.41E-02	2.75E+01	1.37E-02	1.92E+00	6.87E-04	1.37E-02	1.37E-02	1.37E-02	1.24E+01	1.37E-02
Del Amo, I-110 to Wilmington	5.12E+01	1.54E-02	5.63E-02	5.12E-03	4.15E-01	1.02E-02	8.66E-01	2.05E-02	1.02E-02	1.17E+01	5.84E-03	8.17E-01	2.92E-04	5.84E-03	5.84E-03	5.84E-03	5.25E+00	5.84E-03
Del Amo, Wilmington to Alameda	1.85E+02	5.56E-02	2.04E-01	1.85E-02	1.50E+00	3.71E-02	3.13E+00	7.41E-02	3.71E-02	4.22E+01	2.11E-02	2.96E+00	1.06E-03	2.11E-02	2.11E-02	2.11E-02	1.90E+01	2.11E-02
Del Amo, Alameda to I-710	1.10E+02	3.29E-02	1.21E-01	1.10E-02	8.88E-01	2.19E-02	1.85E+00	4.39E-02	2.19E-02	2.50E+01	1.25E-02	1.75E+00	6.25E-04	1.25E-02	1.25E-02	1.25E-02	1.12E+01	1.25E-02
223rd Street, I-110 to Avalon	1.52E+01	4.57E-03	1.68E-02	1.52E-03	1.23E-01	3.05E-03	2.57E-01	6.09E-03	3.05E-03	3.47E+00	1.74E-03	2.43E-01	8.68E-05	1.74E-03	1.74E-03	1.74E-03	1.56E+00	1.74E-03
223rd Street, Avalon to Wilmington	1.08E+01	3.24E-03	1.19E-02	1.08E-03	8.75E-02	2.16E-03	1.83E-01	4.32E-03	2.16E-03	2.46E+00	1.23E-03	1.72E-01	6.15E-05	1.23E-03	1.23E-03	1.23E-03	1.11E+00	1.23E-03
223rd Street, Wilmington to Alameda	1.46E+02	4.37E-02	1.60E-01	1.46E-02	1.18E+00	2.91E-02	2.46E+00	5.83E-02	2.91E-02	3.32E+01	1.66E-02	2.32E+00	8.30E-04	1.66E-02	1.66E-02	1.66E-02	1.49E+01	1.66E-02
W Wardlow from Alameda to I-710	1.70E+02	5.09E-02	1.87E-01	1.70E-02	1.37E+00	3.39E-02	2.87E+00	6.78E-02	3.39E-02	3.87E+01	1.93E-02	2.71E+00	9.66E-04	1.93E-02	1.93E-02	1.93E-02	1.74E+01	1.93E-02

Table B-5
2030 Alternative 1
Annual Average Truck Emissions

	SCAG - Gasoline Trucks					
	TOG	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
		71432	50000	106990	75070	107028
Alternative 1, 2030	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to Transition						
New Dock Ramps - Cerritos Channel (A1 Line)	6.86E-01	1.45E-02	9.33E-03	3.20E-03	1.68E-03	7.75E-04
SB Cerritos Channel - Transition (G1 Line)	1.86E-01	3.92E-03	2.53E-03	8.66E-04	4.55E-04	2.10E-04
NB Cerritos Channel - Transition (E1 Line)	2.14E-01	4.52E-03	2.92E-03	9.99E-04	5.25E-04	2.42E-04
Mainline Transition to HF Ramps & SR-103	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	2.98E-01	6.27E-03	4.05E-03	1.39E-03	7.29E-04	3.36E-04
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	2.59E-01	5.45E-03	3.52E-03	1.21E-03	6.34E-04	2.92E-04
Henry Ford Ramps	8.98E-01	1.89E-02	1.22E-02	4.18E-03	2.20E-03	1.01E-03
Henry Ford n/o Ramps to Alameda	4.26E+00	8.98E-02	5.79E-02	1.98E-02	1.04E-02	4.81E-03
SR-47 Extension, HF Ramps to Alameda	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB, 103 Split to Dominguex Channel (D1 Line)	5.40E-01	1.14E-02	7.35E-03	2.52E-03	1.32E-03	6.10E-04
NB, 103 Split to Dominguex Channel (F1 Line)	5.33E-01	1.12E-02	7.24E-03	2.48E-03	1.30E-03	6.02E-04
Dominguex Channel - Alameda (I1 Line)	1.28E+00	2.70E-02	1.74E-02	5.97E-03	3.14E-03	1.45E-03
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.61E+00	3.39E-02	2.19E-02	7.49E-03	3.94E-03	1.82E-03
SR-103 Anaheim to PCH	1.54E+00	3.25E-02	2.09E-02	7.17E-03	3.77E-03	1.74E-03
SR-103 PCH to Sepulveda/Willow	4.35E+00	9.17E-02	5.91E-02	2.03E-02	1.07E-02	4.91E-03
E and W Harry Bridges, Figueroa to start Alameda	3.79E+00	7.99E-02	5.16E-02	1.77E-02	9.29E-03	4.28E-03
Alameda beginning (E Harry Bridges) to Anaheim	5.06E+00	1.07E-01	6.88E-02	2.36E-02	1.24E-02	5.72E-03
Alameda Anaheim to Henry Ford	2.92E+00	6.15E-02	3.97E-02	1.36E-02	7.15E-03	3.30E-03
Alameda, Henry Ford to PCH	2.42E+00	5.11E-02	3.30E-02	1.13E-02	5.94E-03	2.74E-03
Alameda PCH to 405	4.19E+01	8.84E-01	5.70E-01	1.95E-01	1.03E-01	4.74E-02
Alameda 405 to del Amo	3.06E+01	6.45E-01	4.16E-01	1.43E-01	7.50E-02	3.46E-02
Alameda, del Amo to South Santa Fe Avenue	1.01E+01	2.14E-01	1.38E-01	4.73E-02	2.49E-02	1.15E-02
Alameda, South Santa Fe Avenue to SR-91	1.09E+01	2.29E-01	1.48E-01	5.07E-02	2.66E-02	1.23E-02
I-110, "C" Street Interchange to Anaheim	1.43E+01	3.01E-01	1.94E-01	6.65E-02	3.50E-02	1.61E-02
I-110, Anaheim to PCH	2.62E+01	5.53E-01	3.57E-01	1.22E-01	6.43E-02	2.96E-02
1-110, PCH to Sepulveda	6.49E+01	1.37E+00	8.83E-01	3.02E-01	1.59E-01	7.33E-02
I-110, Sepulveda to Carson	1.09E+02	2.31E+00	1.49E+00	5.10E-01	2.68E-01	1.24E-01
I-110, Carson to Del Amo	7.47E+01	1.57E+00	1.02E+00	3.48E-01	1.83E-01	8.44E-02
I-110, Del Amo to 405	6.16E+01	1.30E+00	8.38E-01	2.87E-01	1.51E-01	6.96E-02
I-110, 405 to SR-91	1.30E+02	2.74E+00	1.77E+00	6.06E-01	3.19E-01	1.47E-01
I-710, Anaheim to PCH	1.86E+01	3.92E-01	2.53E-01	8.66E-02	4.55E-02	2.10E-02
I-710, PCH to Willow	4.00E+01	8.44E-01	5.44E-01	1.86E-01	9.81E-02	4.52E-02
I-710, Willow to 405	6.26E+01	1.32E+00	8.51E-01	2.92E-01	1.53E-01	7.07E-02
I-710, 405 to Del Amo	9.23E+01	1.95E+00	1.26E+00	4.30E-01	2.26E-01	1.04E-01
I-710, Del Amo to Long Beach Blvd Interchange	8.31E+01	1.75E+00	1.13E+00	3.87E-01	2.03E-01	9.39E-02
I-710, Long Beach Boulevard to SR-91	9.95E+01	2.10E+00	1.35E+00	4.63E-01	2.44E-01	1.12E-01
PCH, I110 to Alameda	2.66E+01	5.60E-01	3.61E-01	1.24E-01	6.51E-02	3.00E-02
PCH, Alameda to SR-103	5.64E+00	1.19E-01	7.67E-02	2.63E-02	1.38E-02	6.37E-03
PCH, SR-103 to I-710	7.58E+00	1.60E-01	1.03E-01	3.53E-02	1.86E-02	8.57E-03
Sepulveda, I-110 to Avalon	1.23E+01	2.60E-01	1.68E-01	5.75E-02	3.02E-02	1.39E-02
Sepulveda, Avalon to Alameda	1.88E+01	3.97E-01	2.56E-01	8.77E-02	4.61E-02	2.13E-02
Sepulveda, Alameda to ICTF	2.59E+00	5.45E-02	3.52E-02	1.20E-02	6.33E-03	2.92E-03
Sepulveda, ICTF to SR-103	5.24E-01	1.10E-02	7.12E-03	2.44E-03	1.28E-03	5.92E-04
Del Amo, I-110 to Wilmington	2.97E+01	6.25E-01	4.03E-01	1.38E-01	7.27E-02	3.35E-02
Del Amo, Wilmington to Alameda	1.69E+01	3.57E-01	2.30E-01	7.89E-02	4.15E-02	1.91E-02
Del Amo, Alameda to I-710	2.15E+01	4.54E-01	2.93E-01	1.00E-01	5.27E-02	2.43E-02
223rd Street, I-110 to Avalon	1.06E+01	2.23E-01	1.44E-01	4.93E-02	2.59E-02	1.20E-02
223rd Street, Avalon to Wilmington	7.25E+00	1.53E-01	9.86E-02	3.38E-02	1.78E-02	8.19E-03
223rd Street, Wilmington to Alameda	9.15E+00	1.93E-01	1.24E-01	4.26E-02	2.24E-02	1.03E-02
W Wardlow from Alameda to I-710	1.86E+01	3.92E-01	2.53E-01	8.66E-02	4.55E-02	2.10E-02

Table B-6
2030 Alternative 2
Annual Average Truck Emissions

	Length	Average Speed	Port AADT Trucks	SCAG AADT Trucks	Port LNG Trucks	Port Dsl / Alt Trucks	SCAG Gasoline Trucks	SCAG Diesel Trucks
2030 Alternative 2	mile	mph	veh/day	veh/day	veh/day	veh/day	veh/day	veh/day
SR-47 Mainline, New Dock Ramps to HF Ramps	0.65	55	35337	172	7853	27484	89	83
Henry Ford Ramps	0.24	25	5135	11	958	4177	6	5
Henry Ford n/o Ramps to Alameda	0.68	25	9277	267	1106	8171	139	128
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.04	55	30197	162	6894	23303	84	78
SR-103 Anaheim to PCH	0.57	55	33721	436	7548	26173	226	210
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	0.47	55	29585	757	6302	23283	393	364
SR-103 Ramps south of Sepulveda/Willow		55	9069	362	1678	7391	188	174
NB Sepulveda Ramp (G2 Line)	0.36	55	5441.4	217.2	1007	4434	113	104
SB Sepulveda Ramp (F2 Ramp)	0.38	55	3627.6	144.8	671	2956	75	70
SR-103 Existing, End Ramps to Sepulveda/Willow		55			0	0	0	0
SB Sepulveda Ramp Traffic	0.07	55	3627.6	144.8	671	2956	75	70
SB+NB Sepulveda Ramp Traffic	0.11	55	9069	362	1678	7391	188	174
SR-103, Realignment to End (223rd/Wardlow)	1.85	50	20517	397	4623	15894	206	191
E and W Harry Bridges, Figueroa to start Alameda	1.44	35	5918	263	1263	4655	136	127
Alameda beginning (E Harry Bridges) to Anaheim	0.77	35	6942	625	2312	4630	324	301
Alameda Anaheim to Henry Ford	0.42	35	4259	638	1577	2682	331	307
Alameda, Henry Ford to PCH	0.34	35	10747	650	2683	8064	337	313
Alameda PCH to 405	2.27	45	8822	1913	2370	6452	993	920
Alameda 405 to del Amo	1.72	45	13654	1778	3046	10608	923	855
Alameda, del Amo to South Santa Fe Avenue	0.84	45	9415	1309	1869	7546	679	630
Alameda, South Santa Fe Avenue to SR-91	1.15	45	7280	1038	1643	5637	539	499
I-110, "C" Street Interchange to Anaheim	0.49	65	17532	3293	5150	12382	1709	1584
I-110, Anaheim to PCH	0.80	65	17838	3772	5291	12547	1958	1814
1-110, PCH to Sepulveda	1.39	65	18532	5345	5536	12996	2774	2571
I-110, Sepulveda to Carson	1.56	65	17174	8019	5154	12020	4162	3857
I-110, Carson to Del Amo	1.02	65	16415	8367	4966	11449	4342	4025
I-110, Del Amo to 405	0.74	65	15889	9547	4100	11789	4955	4592
I-110, 405 to SR-91	1.09	65	13577	13705	3993	9584	7113	6592
I-710, Anaheim to PCH	0.50	65	64694	4240	16542	48152	2201	2039
I-710, PCH to Willow	1.01	65	64713	4612	17264	47449	2394	2218
I-710, Willow to 405	1.52	65	64376	4723	17170	47206	2451	2272
I-710, 405 to Del Amo	1.42	65	64701	7158	16874	47827	3715	3443
I-710, Del Amo to Long Beach Blvd Interchange	1.17	65	64698	7741	16694	48004	4018	3723
I-710, Long Beach Boulevard to SR-91	0.96	65	64411	11460	16588	47823	5948	5512
PCH, I-110 to Alameda	2.38	50	3071	1374	741	2330	713	661
PCH, Alameda to SR-103	0.94	50	747	570	141	606	296	274
PCH, SR-103 to I-710	0.98	50	7366	968	1804	5562	502	466
Sepulveda, I-110 to Avalon	1.37	40	535	828	116	419	430	398
Sepulveda, Avalon to Alameda	1.70	40	516	1013	66	450	526	487
Sepulveda, Alameda to ICTF	0.67	40	1800	326	462	1338	169	157
Sepulveda, ICTF to SR-103	0.17	40	9069	253	1678	7391	131	122
Del Amo, I-110 to Wilmington	2.96	40	340	891	44	296	462	429
Del Amo, Wilmington to Alameda	0.77	40	1906	1962	607	1299	1018	944
Del Amo, Alameda to I-710	0.87	40	2323	2050	336	1987	1064	986
223rd Street, I-110 to Avalon	1.36	45	205	738	36	169	383	355
223rd Street, Avalon to Wilmington	1.23	45	185	640	42	143	332	308
223rd Street, Wilmington to Alameda	0.79	45	2443	1085	489	1954	563	522
W Wardlow from Alameda to I-710	1.30	45	5534	1409	527	5007	731	678

Table B-6
2030 Alternative 2
Annual Average Truck Emissions

	Port	Port	Port	Port	SCAG		Port	Port	Port	SCAG	
	LNG TOG	LNG PM10	LNG DPM	Dsl Exhst PM	Gasoline TOG	Dsl Exhst PM	LNG TOG	LNG PM10	LNG+DSL DPM	Gasoline TOG	Dsl Exhst PM
2030 Alternative 2	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	lb/yr	lb/yr	lb/year	lb/year	lb/year
SR-47 Mainline, New Dock Ramps to HF Ramps	0.489	0.111	0.006	0.076	0.021	0.060	2,008	458	1,117	1	3
Henry Ford Ramps	0.489	0.111	0.006	0.045	0.051	0.053	90.502	20.628	37.3	0.1	0.1
Henry Ford n/o Ramps to Alameda	0.489	0.111	0.006	0.045	0.051	0.053	295.806	67.422	204.1	3.9	3.7
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	0.489	0.111	0.006	0.076	0.021	0.060	2821.173	643.022	1516.9	1.5	3.9
SR-103 Anaheim to PCH	0.489	0.111	0.006	0.076	0.021	0.060	1692.893	385.857	933.3	2.2	5.7
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	0.489	0.111	0.006	0.076	0.021	0.060	1165.403	265.627	683.7	3.1	8.2
SR-103 Ramps south of Sepulveda/Willow	0.489	0.111	0.006						0.0		
NB Sepulveda Ramp (G2 Line)	0.489	0.111	0.006	0.076	0.021	0.060	142.643	32.512	99.4	0.7	1.8
SB Sepulveda Ramp (F2 Ramp)	0.489	0.111	0.006	0.076	0.021	0.060	100.378	22.879	70.0	0.5	1.3
SR-103 Existing, End Ramps to Sepulveda/Willow	0.489	0.111	0.006						0.0		
SB Sepulveda Ramp Traffic	0.489	0.111	0.006	0.076	0.021	0.060	18.491	4.215	12.9	0.1	0.2
SB+NB Sepulveda Ramp Traffic	0.489	0.111	0.006	0.076	0.021	0.060	72.642	16.557	50.6	0.3	0.9
SR-103, Realignment to End (223rd/Wardlow)	0.489	0.111	0.006	0.066	0.022	0.055	3364.935	766.960	1609.1	6.7	15.5
E and W Harry Bridges, Figueroa to start Alameda	0.489	0.111	0.006	0.047	0.032	0.048	717.212	163.472	265.2	5.1	7.1
Alameda beginning (E Harry Bridges) to Anaheim	0.489	0.111	0.006	0.047	0.032	0.048	700.157	159.585	144.5	6.4	8.9
Alameda Anaheim to Henry Ford	0.489	0.111	0.006	0.047	0.032	0.048	261.727	59.655	46.3	3.6	5.0
Alameda, Henry Ford to PCH	0.489	0.111	0.006	0.047	0.032	0.048	362.701	82.670	110.2	3.0	4.2
Alameda PCH to 405	0.489	0.111	0.006	0.058	0.024	0.051	2113.322	481.684	706.2	43.5	84.9
Alameda 405 to del Amo	0.489	0.111	0.006	0.058	0.024	0.051	2062.474	470.094	874.7	30.7	59.9
Alameda, del Amo to South Santa Fe Avenue	0.489	0.111	0.006	0.058	0.024	0.051	618.154	140.894	302.7	11.0	21.6
Alameda, South Santa Fe Avenue to SR-91	0.489	0.111	0.006	0.058	0.024	0.051	745.597	169.942	311.6	12.0	23.4
I-110, "C" Street Interchange to Anaheim	0.489	0.111	0.006	0.101	0.021	0.074	996.612	227.155	505.7	14.2	46.4
I-110, Anaheim to PCH	0.489	0.111	0.006	0.101	0.021	0.074	1671.852	381.061	837.0	26.6	86.8
1-110, PCH to Sepulveda	0.489	0.111	0.006	0.101	0.021	0.074	3019.721	688.277	1496.8	65.0	212.3
I-110, Sepulveda to Carson	0.489	0.111	0.006	0.101	0.021	0.074	3157.865	719.763	1555.5	109.5	357.8
I-110, Carson to Del Amo	0.489	0.111	0.006	0.101	0.021	0.074	1996.475	455.051	972.3	75.0	244.9
I-110, Del Amo to 405	0.489	0.111	0.006	0.101	0.021	0.074	1195.450	272.476	722.5	62.0	202.7
I-110, 405 to SR-91	0.489	0.111	0.006	0.101	0.021	0.074	1716.957	391.341	869.8	131.4	429.2
I-710, Anaheim to PCH	0.489	0.111	0.006	0.101	0.021	0.074	3250.794	740.944	1988.7	18.6	60.7
I-710, PCH to Willow	0.489	0.111	0.006	0.101	0.021	0.074	6829.075	1556.532	3949.5	40.7	132.9
I-710, Willow to 405	0.489	0.111	0.006	0.101	0.021	0.074	10290.316	2345.443	5952.7	63.1	206.1
I-710, 405 to Del Amo	0.489	0.111	0.006	0.101	0.021	0.074	9424.601	2148.123	5617.1	89.1	291.1
I-710, Del Amo to Long Beach Blvd Interchange	0.489	0.111	0.006	0.101	0.021	0.074	7711.514	1757.664	4661.8	79.7	260.4
I-710, Long Beach Boulevard to SR-91	0.489	0.111	0.006	0.101	0.021	0.074	6271.824	1429.520	3801.0	96.6	315.5
PCH, I-110 to Alameda	0.489	0.111	0.006	0.066	0.022	0.055	693.780	158.131	304.0	30.0	69.0
PCH, Alameda to SR-103	0.489	0.111	0.006	0.066	0.022	0.055	52.307	11.922	31.1	4.9	11.3
PCH, SR-103 to I-710	0.489	0.111	0.006	0.066	0.022	0.055	696.724	158.802	299.6	8.7	20.0
Sepulveda, I-110 to Avalon	0.489	0.111	0.006	0.052	0.027	0.049	62.486	14.242	24.8	12.8	21.3
Sepulveda, Avalon to Alameda	0.489	0.111	0.006	0.052	0.027	0.049	44.117	10.056	32.5	19.4	32.4
Sepulveda, Alameda to ICTF	0.489	0.111	0.006	0.052	0.027	0.049	122.597	27.943	39.2	2.5	4.1
Sepulveda, ICTF to SR-103	0.489	0.111	0.006	0.052	0.027	0.049	113.182	25.797	54.4	0.5	0.8
Del Amo, I-110 to Wilmington	0.489	0.111	0.006	0.052	0.027	0.049	51.225	11.676	37.3	29.7	49.6
Del Amo, Wilmington to Alameda	0.489	0.111	0.006	0.052	0.027	0.049	182.895	41.687	43.8	16.9	28.3
Del Amo, Alameda to I-710	0.489	0.111	0.006	0.052	0.027	0.049	115.161	26.248	73.9	20.2	33.6
223rd Street, I-110 to Avalon	0.489	0.111	0.006	0.058	0.024	0.051	19.307	4.401	11.0	10.1	19.7
223rd Street, Avalon to Wilmington	0.489	0.111	0.006	0.058	0.024	0.051	20.251	4.616	8.4	7.9	15.4
223rd Street, Wilmington to Alameda	0.489	0.111	0.006	0.058	0.024	0.051	151.752	34.588	73.6	8.6	16.8
W Wardlow from Alameda to I-710	0.489	0.111	0.006	0.058	0.024	0.051	269.426	61.409	306.2	18.4	35.9

Table B-6
2030 Alternative 2
Annual Average Truck Emissions

	Total Average Annual Toxic Emissions from Trucks																	
	DPM	Acet-aldehyde	Acrolein	Benzene	Bromine	1,3-Butadiene	Chlorine	Chromium	Copper	Form-aldehyde	n-Hexane	Manganese	Nickel	Propylene	Sulfates	Toluene	Xylenes	Zinc
	9901	75070	107028	71432	7726956	106990	7782505	18540299	7440508	50000	110543	7439965	7440020	115071	9960	108883	1330207	7440666
2030 Alternative 2	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to HF Ramps	1.12E+03	6.05E-01	1.11E-03	2.23E+00	2.29E-01	4.57E-03	3.20E+01	1.14E-02	2.29E-01	1.63E+01	4.02E-01	2.29E-01	2.29E-01	3.39E+01	2.06E+02	8.03E-01	4.02E-01	2.29E-01
Henry Ford Ramps	3.73E+01	2.73E-02	6.35E-05	1.01E-01	1.03E-02	2.62E-04	1.44E+00	5.16E-04	1.03E-02	7.34E-01	1.81E-02	1.03E-02	1.03E-02	1.53E+00	9.28E+00	3.62E-02	1.81E-02	1.03E-02
Henry Ford n/o Ramps to Alameda	2.08E+02	9.82E-02	4.37E-03	4.07E-01	3.37E-02	1.80E-02	4.72E+00	1.69E-03	3.37E-02	2.45E+00	5.92E-02	3.37E-02	3.37E-02	5.00E+00	3.03E+01	1.18E-01	5.92E-02	3.37E-02
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.52E+03	8.50E-01	1.67E-03	3.13E+00	3.22E-01	6.88E-03	4.50E+01	1.61E-02	3.22E-01	2.29E+01	5.64E-01	3.22E-01	3.22E-01	4.77E+01	2.89E+02	1.13E+00	5.64E-01	3.22E-01
SR-103 Anaheim to PCH	9.39E+02	5.13E-01	2.46E-03	1.91E+00	1.93E-01	1.02E-02	2.70E+01	9.65E-03	1.93E-01	1.37E+01	3.39E-01	1.93E-01	1.93E-01	2.86E+01	1.74E+02	6.77E-01	3.39E-01	1.93E-01
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	6.92E+02	3.57E-01	3.53E-03	1.35E+00	1.33E-01	1.45E-02	1.86E+01	6.64E-03	1.33E-01	9.48E+00	2.33E-01	1.33E-01	1.33E-01	1.97E+01	1.20E+02	4.66E-01	2.33E-01	1.33E-01
SR-103 Ramps south of Sepulveda/Willow																		
NB Sepulveda Ramp (G2 Line)	1.01E+02	4.45E-02	7.75E-04	1.71E-01	1.63E-02	3.19E-03	2.28E+00	8.13E-04	1.63E-02	1.16E+00	2.85E-02	1.63E-02	1.63E-02	2.41E+00	1.46E+01	5.71E-02	2.85E-02	1.63E-02
SB Sepulveda Ramp (F2 Ramp)	7.12E+01	3.13E-02	5.45E-04	1.21E-01	1.14E-02	2.25E-03	1.60E+00	5.72E-04	1.14E-02	8.20E-01	2.01E-02	1.14E-02	1.14E-02	1.70E+00	1.03E+01	4.02E-02	2.01E-02	1.14E-02
SR-103 Existing, End Ramps to Sepulveda/Willow																		
SB Sepulveda Ramp Traffic	1.31E+01	5.77E-03	1.00E-04	2.22E-02	2.11E-03	4.14E-04	2.95E-01	1.05E-04	2.11E-03	1.51E-01	3.70E-03	2.11E-03	2.11E-03	3.12E-01	1.90E+00	7.40E-03	3.70E-03	2.11E-03
SB+NB Sepulveda Ramp Traffic	5.15E+01	2.26E-02	3.95E-04	8.73E-02	8.28E-03	1.63E-03	1.16E+00	4.14E-04	8.28E-03	5.93E-01	1.45E-02	8.28E-03	8.28E-03	1.23E+00	7.45E+00	2.91E-02	1.45E-02	8.28E-03
SR-103, Realignment to End (223rd/Wardlow)	1.62E+03	1.03E+00	7.63E-03	3.84E+00	3.83E-01	3.14E-02	5.37E+01	1.92E-02	3.83E-01	2.73E+01	6.73E-01	3.83E-01	3.83E-01	5.69E+01	3.45E+02	1.35E+00	6.73E-01	3.83E-01
E and W Harry Bridges, Figueroa to start Alameda	2.72E+02	2.28E-01	5.73E-03	8.96E-01	8.17E-02	2.36E-02	1.14E+01	4.09E-03	8.17E-02	5.88E+00	1.43E-01	8.17E-02	8.17E-02	1.21E+01	7.36E+01	2.87E-01	1.43E-01	8.17E-02
Alameda beginning (E Harry Bridges) to Anaheim	1.53E+02	2.26E-01	7.27E-03	9.06E-01	7.98E-02	3.00E-02	1.12E+01	3.99E-03	7.98E-02	5.76E+00	1.40E-01	7.98E-02	7.98E-02	1.18E+01	7.18E+01	2.80E-01	1.40E-01	7.98E-02
Alameda Anaheim to Henry Ford	5.13E+01	8.73E-02	4.06E-03	3.64E-01	2.98E-02	1.68E-02	4.18E+00	1.49E-03	2.98E-02	2.17E+00	5.23E-02	2.98E-02	2.98E-02	4.42E+00	2.68E+01	1.05E-01	5.23E-02	2.98E-02
Alameda, Henry Ford to PCH	1.14E+02	1.16E-01	3.37E-03	4.62E-01	4.13E-02	1.39E-02	5.79E+00	2.07E-03	4.13E-02	2.98E+00	7.25E-02	4.13E-02	4.13E-02	6.13E+00	3.72E+01	1.45E-01	7.25E-02	4.13E-02
Alameda PCH to 405	7.91E+02	7.40E-01	4.91E-02	3.24E+00	2.41E-01	2.02E-01	3.37E+01	1.20E-02	2.41E-01	1.77E+01	4.23E-01	2.41E-01	2.41E-01	3.57E+01	2.17E+02	8.45E-01	4.23E-01	2.41E-01
Alameda 405 to del Amo	9.35E+02	6.94E-01	3.47E-02	2.92E+00	2.35E-01	1.43E-01	3.29E+01	1.18E-02	2.35E-01	1.71E+01	4.12E-01	2.35E-01	2.35E-01	3.49E+01	2.12E+02	8.25E-01	4.12E-01	2.35E-01
Alameda, del Amo to South Santa Fe Avenue	3.24E+02	2.12E-01	1.25E-02	9.12E-01	7.04E-02	5.14E-02	9.86E+00	3.52E-03	7.04E-02	5.16E+00	1.24E-01	7.04E-02	7.04E-02	1.04E+01	6.34E+01	2.47E-01	1.24E-01	7.04E-02
Alameda, South Santa Fe Avenue to SR-91	3.35E+02	2.53E-01	1.36E-02	1.07E+00	8.50E-02	5.59E-02	1.19E+01	4.25E-03	8.50E-02	6.20E+00	1.49E-01	8.50E-02	8.50E-02	1.26E+01	7.65E+01	2.98E-01	1.49E-01	8.50E-02
I-110, "C" Street Interchange to Anaheim	5.52E+02	3.34E-01	1.61E-02	1.40E+00	1.14E-01	6.62E-02	1.59E+01	5.68E-03	1.14E-01	8.27E+00	1.99E-01	1.14E-01	1.14E-01	1.68E+01	1.02E+02	3.99E-01	1.99E-01	1.14E-01
I-110, Anaheim to PCH	9.24E+02	5.67E-01	3.00E-02	2.40E+00	1.91E-01	1.24E-01	2.67E+01	9.53E-03	1.91E-01	1.39E+01	3.34E-01	1.91E-01	1.91E-01	2.83E+01	1.71E+02	6.69E-01	3.34E-01	1.91E-01
1-110, PCH to Sepulveda	1.71E+03	1.07E+00	7.34E-02	4.69E+00	3.44E-01	3.03E-01	4.82E+01	1.72E-02	3.44E-01	2.53E+01	6.04E-01	3.44E-01	3.44E-01	5.10E+01	3.10E+02	1.21E+00	6.04E-01	3.44E-01
I-110, Sepulveda to Carson	1.91E+03	1.22E+00	1.24E-01	5.78E+00	3.60E-01	5.10E-01	5.04E+01	1.80E-02	3.60E-01	2.71E+01	6.32E-01	3.60E-01	3.60E-01	5.34E+01	3.24E+02	1.26E+00	6.32E-01	3.60E-01
I-110, Carson to Del Amo	1.22E+03	7.83E-01	8.47E-02	3.78E+00	2.28E-01	3.49E-01	3.19E+01	1.14E-02	2.28E-01	1.72E+01	3.99E-01	2.28E-01	2.28E-01	3.37E+01	2.05E+02	7.99E-01	3.99E-01	2.28E-01
I-110, Del Amo to 405	9.25E+02	5.11E-01	7.01E-02	2.62E+00	1.36E-01	2.89E-01	1.91E+01	6.81E-03	1.36E-01	1.05E+01	2.39E-01	1.36E-01	1.36E-01	2.02E+01	1.23E+02	4.78E-01	2.39E-01	1.36E-01
I-110, 405 to SR-91	1.30E+03	8.37E-01	1.48E-01	4.66E+00	1.96E-01	6.12E-01	2.74E+01	9.78E-03	1.96E-01	1.57E+01	3.43E-01	1.96E-01	1.96E-01	2.90E+01	1.76E+02	6.87E-01	3.43E-01	1.96E-01
I-710, Anaheim to PCH	2.05E+03	1.02E+00	2.10E-02	3.97E+00	3.70E-01	8.65E-02	5.19E+01	1.85E-02	3.70E-01	2.66E+01	6.50E-01	3.70E-01	3.70E-01	5.49E+01	3.33E+02	1.30E+00	6.50E-01	3.70E-01
I-710, PCH to Willow	4.08E+03	2.15E+00	4.60E-02	8.37E+00	7.78E-01	1.89E-01	1.09E+02	3.89E-02	7.78E-01	5.59E+01	1.37E+00	7.78E-01	7.78E-01	1.15E+02	7.00E+02	2.73E+00	1.37E+00	7.78E-01
I-710, Willow to 405	6.16E+03	3.24E+00	7.13E-02	1.26E+01	1.17E+00	2.94E-01	1.64E+02	5.86E-02	1.17E+00	8.42E+01	2.06E+00	1.17E+00	1.17E+00	1.74E+02	1.06E+03	4.12E+00	2.06E+00	1.17E+00
I-710, 405 to Del Amo	5.91E+03	3.05E+00	1.01E-01	1.22E+01	1.07E+00	4.15E-01	1.50E+02	5.37E-02	1.07E+00	7.76E+01	1.88E+00	1.07E+00	1.07E+00	1.59E+02	9.67E+02	3.77E+00	1.88E+00	1.07E+00
I-710, Del Amo to Long Beach Blvd Interchange	4.92E+03	2.51E+00	9.01E-02	1.02E+01	8.79E-01	3.71E-01	1.23E+02	4.39E-02	8.79E-01	6.35E+01	1.54E+00	8.79E-01	8.79E-01	1.30E+02	7.91E+02	3.08E+00	1.54E+00	8.79E-01
I-710, Long Beach Boulevard to SR-91	4.12E+03	2.12E+00	1.09E-01	8.93E+00	7.15E-01	4.50E-01	1.00E+02	3.57E-02	7.15E-01	5.21E+01	1.25E+00	7.15E-01	7.15E-01	1.06E+02	6.43E+02	2.51E+00	1.25E+00	7.15E-01
PCH, I-110 to Alameda	3.73E+02	2.82E-01	3.39E-02	1.40E+00	7.91E-02	1.40E-01	1.11E+01	3.95E-03	7.91E-02	6.03E+00	1.39E-01	7.91E-02	7.91E-02	1.17E+01	7.12E+01	2.78E-01	1.39E-01	7.91E-02
PCH, Alameda to SR-103	4.24E+01	2.78E-02	5.57E-03	1.61E-01	5.96E-03	2.30E-02	8.35E-01	2.98E-04	5.96E-03	4.91E-01	1.05E-02	5.96E-03	5.96E-03	8.84E-01	5.37E+00	2.09E-02	1.05E-02	5.96E-03
PCH, SR-103 to I-710	3.20E+02	2.30E-01	9.87E-03	9.50E-01	7.94E-02	4.07E-02	1.11E+01	3.97E-03	7.94E-02	5.76E+00	1.39E-01	7.94E-02	7.94E-02	1.18E+01	7.15E+01	2.79E-01	1.39E-01	7.94E-02
Sepulveda, I-110 to Avalon	4.61E+01	5.01E-02	1.44E-02	3.38E-01	7.12E-03	5.96E-02	9.97E-01	3.56E-04	7.12E-03	6.80E-01	1.25E-02	7.12E-03	7.12E-03	1.06E+00	6.41E+00	2.50E-02	1.25E-02	7.12E-03
Sepulveda, Avalon to Alameda	6.49E+01	6.08E-02	2.19E-02	4.58E-01	5.03E-03	9.04E-02	7.04E-01	2.51E-04	5.03E-03	6.21E-01	8.82E-03	5.03E-03	5.03E-03	7.46E-01	4.52E+00	1.76E-02	8.82E-03	5.03E-03
Sepulveda, Alameda to ICTF	4.34E+01	4.29E-02	2.80E-03	1.87E-01	1.40E-02	1.16E-02	1.96E+00	6.99E-04	1.40E-02	1.03E+00	2.45E-02	1.40E-02	1.40E-02	2.07E+00	1.26E+01	4.90E-02	2.45E-02	1.40E-02
Sepulveda, ICTF to SR-103	5.52E+01	3.52E-02	5.53E-04	1.35E-01	1.29E-02	2.28E-03	1.81E+00	6.45E-04	1.29E-02	9.23E-01	2.26E-02	1.29E-02	1.29E-02	1.91E+00	1.16E+01	4.53E-02	2.26E-02	1.29E-02
Del Amo, I-110 to Wilmington	8.69E+01	8.82E-02	3.36E-02	6.83E-01	5.84E-03	1.38E-01	8.17E-01	2.92E-04	5.84E-03	8.19E-01	1.02E-02	5.84E-03	5.84E-03	8.66E-01	5.25E+00	2.05E-02	1.02E-02	5.84E-03
Del Amo, Wilmington to Alameda	7.21E+01	9.64E-02	1.91E-02	5.58E-01	2.08E-02	7.89E-02	2.92E+00	1.04E-03	2.08E-02	1.71E+00	3.66E-02	2.08E-02	2.08E-02	3.09E+00	1.88E+01	7.32E-02	3.66E-02	2.08E-02
Del Amo, Alameda to I-710	1.08E+02	8.39E-02	2.28E-02	5.52E-01	1.31E-02	9.39E-02	1.84E+00	6.56E-04	1.31E-02	1.21E+00	2.30E-02	1.31E-02	1.31E-02	1.95E+00	1.18E+01	4.61E-02	2.30E-02	1.31E-02
223rd Street, I-110 to Avalon	3.07E+01	3.05E-02	1.14E-02	2.34E-01	2.20E-03	4.70E-02	3.08E-01	1.10E-04	2.20E-03	2.94E-01	3.86E-03	2.20E-03	2.20E-03	3.26E-01	1.98E+00	7.72E-03	3.86E-03	2.20E-03
223rd Street, Avalon to Wilmington	2.38E+01	2.53E-02	8.88E-03	1.88E-01	2.31E-03	3.66E-02	3.23E-01	1.15E-04	2.31E-03	2.71E-01	4.05E-03	2.31E-03	2.31E-03	3.42E-01	2.08E+00	8.10E-03	4.05E-03	2.31E-03
223rd Street, Wilmington to Alameda	9.04E+01	6.65E-02	9.70E-03	3.48E-01	1.73E-02	4.00E-02	2.42E+00	8.65E-04	1.73E-02	1.35E+00	3.04E-02	1.73E-02	1.73E-02	2.56E+00	1.56E+01	6.07E-02	3.04E-02	1.73E-02
W Wardlow from Alameda to I-710	3.42E+02	1.26E-01	2.07E-02	6.83E-01	3.07E-02	8.55E-02	4.30E+00	1.54E-03	3.07E-02	2.43E+00	5.39E-02	3.07E-02	3.07E-02	4.55E+00	2.76E+01	1.08E-01	5.39E-02	3.07E-02

Table B-6
2030 Alternative 2
Annual Average Truck Emissions

	Port - LNG Emissions									Port - LNG Emissions								
	TOG	Acetaldehyde	Benzene	Ethylbenzene	Formaldehyde	n-Hexane	Propylene	Toluene	Xylenes	PM10	Bromine	Chlorine	Chromium (hex)	Copper	Manganese	Nickel	Sulfates	Zinc
		75070	71432	100414	50000	110543	115071	108883	1330207		7726956	7782505	18540299	7440508	7439965	7440020	9960	7440666
2030 Alternative 2	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to HF Ramps	2.01E+03	6.03E-01	2.21E+00	2.01E-01	1.63E+01	4.02E-01	3.39E+01	8.03E-01	4.02E-01	4.58E+02	2.29E-01	3.20E+01	1.14E-02	2.29E-01	2.29E-01	2.29E-01	2.06E+02	2.29E-01
Henry Ford Ramps	9.05E+01	2.72E-02	9.96E-02	9.05E-03	7.33E-01	1.81E-02	1.53E+00	3.62E-02	1.81E-02	2.06E+01	1.03E-02	1.44E+00	5.16E-04	1.03E-02	1.03E-02	1.03E-02	9.28E+00	1.03E-02
Henry Ford n/o Ramps to Alameda	2.96E+02	8.87E-02	3.25E-01	2.96E-02	2.40E+00	5.92E-02	5.00E+00	1.18E-01	5.92E-02	6.74E+01	3.37E-02	4.72E+00	1.69E-03	3.37E-02	3.37E-02	3.37E-02	3.03E+01	3.37E-02
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	2.82E+03	8.46E-01	3.10E+00	2.82E-01	2.29E+01	5.64E-01	4.77E+01	1.13E+00	5.64E-01	6.43E+02	3.22E-01	4.50E+01	1.61E-02	3.22E-01	3.22E-01	3.22E-01	2.89E+02	3.22E-01
SR-103 Anaheim to PCH	1.69E+03	5.08E-01	1.86E+00	1.69E-01	1.37E+01	3.39E-01	2.86E+01	6.77E-01	3.39E-01	3.86E+02	1.93E-01	2.70E+01	9.65E-03	1.93E-01	1.93E-01	1.93E-01	1.74E+02	1.93E-01
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	1.17E+03	3.50E-01	1.28E+00	1.17E-01	9.44E+00	2.33E-01	1.97E+01	4.66E-01	2.33E-01	2.66E+02	1.33E-01	1.86E+01	6.64E-03	1.33E-01	1.33E-01	1.33E-01	1.20E+02	1.33E-01
SR-103 Ramps south of Sepulveda/Willow	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NB Sepulveda Ramp (G2 Line)	1.43E+02	4.28E-02	1.57E-01	1.43E-02	1.16E+00	2.85E-02	2.41E+00	5.71E-02	2.85E-02	3.25E+01	1.63E-02	2.28E+00	8.13E-04	1.63E-02	1.63E-02	1.63E-02	1.46E+01	1.63E-02
SB Sepulveda Ramp (F2 Ramp)	1.00E+02	3.01E-02	1.10E-01	1.00E-02	8.13E-01	2.01E-02	1.70E+00	4.02E-02	2.01E-02	2.29E+01	1.14E-02	1.60E+00	5.72E-04	1.14E-02	1.14E-02	1.14E-02	1.03E+01	1.14E-02
SR-103 Existing, End Ramps to Sepulveda/Willow	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB Sepulveda Ramp Traffic	1.85E+01	5.55E-03	2.03E-02	1.85E-03	1.50E-01	3.70E-03	3.12E-01	7.40E-03	3.70E-03	4.21E+00	2.11E-03	2.95E-01	1.05E-04	2.11E-03	2.11E-03	2.11E-03	1.90E+00	2.11E-03
SB+NB Sepulveda Ramp Traffic	7.26E+01	2.18E-02	7.99E-02	7.26E-03	5.88E-01	1.45E-02	1.23E+00	2.91E-02	1.45E-02	1.66E+01	8.28E-03	1.16E+00	4.14E-04	8.28E-03	8.28E-03	8.28E-03	7.45E+00	8.28E-03
SR-103, Realignment to End (223rd/Wardlow)	3.36E+03	1.01E+00	3.70E+00	3.36E-01	2.73E+01	6.73E-01	5.69E+01	1.35E+00	6.73E-01	7.67E+02	3.83E-01	5.37E+01	1.92E-02	3.83E-01	3.83E-01	3.83E-01	3.45E+02	3.83E-01
E and W Harry Bridges, Figueroa to start Alameda	7.17E+02	2.15E-01	7.89E-01	7.17E-02	5.81E+00	1.43E-01	1.21E+01	2.87E-01	1.43E-01	1.63E+02	8.17E-02	1.14E+01	4.09E-03	8.17E-02	8.17E-02	8.17E-02	7.36E+01	8.17E-02
Alameda beginning (E Harry Bridges) to Anaheim	7.00E+02	2.10E-01	7.70E-01	7.00E-02	5.67E+00	1.40E-01	1.18E+01	2.80E-01	1.40E-01	1.60E+02	7.98E-02	1.12E+01	3.99E-03	7.98E-02	7.98E-02	7.98E-02	7.18E+01	7.98E-02
Alameda Anaheim to Henry Ford	2.62E+02	7.85E-02	2.88E-01	2.62E-02	2.12E+00	5.23E-02	4.42E+00	1.05E-01	5.23E-02	5.97E+01	2.98E-02	4.18E+00	1.49E-03	2.98E-02	2.98E-02	2.98E-02	2.68E+01	2.98E-02
Alameda, Henry Ford to PCH	3.63E+02	1.09E-01	3.99E-01	3.63E-02	2.94E+00	7.25E-02	6.13E+00	1.45E-01	7.25E-02	8.27E+01	4.13E-02	5.79E+00	2.07E-03	4.13E-02	4.13E-02	4.13E-02	3.72E+01	4.13E-02
Alameda PCH to 405	2.11E+03	6.34E-01	2.32E+00	2.11E-01	1.71E+01	4.23E-01	3.57E+01	8.45E-01	4.23E-01	4.82E+02	2.41E-01	3.37E+01	1.20E-02	2.41E-01	2.41E-01	2.41E-01	2.17E+02	2.41E-01
Alameda 405 to del Amo	2.06E+03	6.19E-01	2.27E+00	2.06E-01	1.67E+01	4.12E-01	3.49E+01	8.25E-01	4.12E-01	4.70E+02	2.35E-01	3.29E+01	1.18E-02	2.35E-01	2.35E-01	2.35E-01	2.12E+02	2.35E-01
Alameda, del Amo to South Santa Fe Avenue	6.18E+02	1.85E-01	6.80E-01	6.18E-02	5.01E+00	1.24E-01	1.04E+01	2.47E-01	1.24E-01	1.41E+02	7.04E-02	9.86E+00	3.52E-03	7.04E-02	7.04E-02	7.04E-02	6.34E+01	7.04E-02
Alameda, South Santa Fe Avenue to SR-91	7.46E+02	2.24E-01	8.20E-01	7.46E-02	6.04E+00	1.49E-01	1.26E+01	2.98E-01	1.49E-01	1.70E+02	8.50E-02	1.19E+01	4.25E-03	8.50E-02	8.50E-02	8.50E-02	7.65E+01	8.50E-02
I-110, "C" Street Interchange to Anaheim	9.97E+02	2.99E-01	1.10E+00	9.97E-02	8.07E+00	1.99E-01	1.68E+01	3.99E-01	1.99E-01	2.27E+02	1.14E-01	1.59E+01	5.68E-03	1.14E-01	1.14E-01	1.14E-01	1.02E+02	1.14E-01
I-110, Anaheim to PCH	1.67E+03	5.02E-01	1.84E+00	1.67E-01	1.35E+01	3.34E-01	2.83E+01	6.69E-01	3.34E-01	3.81E+02	1.91E-01	2.67E+01	9.53E-03	1.91E-01	1.91E-01	1.91E-01	1.71E+02	1.91E-01
1-110, PCH to Sepulveda	3.02E+03	9.06E-01	3.32E+00	3.02E-01	2.45E+01	6.04E-01	5.10E+01	1.21E+00	6.04E-01	6.88E+02	3.44E-01	4.82E+01	1.72E-02	3.44E-01	3.44E-01	3.44E-01	3.10E+02	3.44E-01
I-110, Sepulveda to Carson	3.16E+03	9.47E-01	3.47E+00	3.16E-01	2.56E+01	6.32E-01	5.34E+01	1.26E+00	6.32E-01	7.20E+02	3.60E-01	5.04E+01	1.80E-02	3.60E-01	3.60E-01	3.60E-01	3.24E+02	3.60E-01
I-110, Carson to Del Amo	2.00E+03	5.99E-01	2.20E+00	2.00E-01	1.62E+01	3.99E-01	3.37E+01	7.99E-01	3.99E-01	4.55E+02	2.28E-01	3.19E+01	1.14E-02	2.28E-01	2.28E-01	2.28E-01	2.05E+02	2.28E-01
I-110, Del Amo to 405	1.20E+03	3.59E-01	1.31E+00	1.20E-01	9.68E+00	2.39E-01	2.02E+01	4.78E-01	2.39E-01	2.72E+02	1.36E-01	1.91E+01	6.81E-03	1.36E-01	1.36E-01	1.36E-01	1.23E+02	1.36E-01
I-110, 405 to SR-91	1.72E+03	5.15E-01	1.89E+00	1.72E-01	1.39E+01	3.43E-01	2.90E+01	6.87E-01	3.43E-01	3.91E+02	1.96E-01	2.74E+01	9.78E-03	1.96E-01	1.96E-01	1.96E-01	1.76E+02	1.96E-01
I-710, Anaheim to PCH	3.25E+03	9.75E-01	3.58E+00	3.25E-01	2.63E+01	6.50E-01	5.49E+01	1.30E+00	6.50E-01	7.41E+02	3.70E-01	5.19E+01	1.85E-02	3.70E-01	3.70E-01	3.70E-01	3.33E+02	3.70E-01
I-710, PCH to Willow	6.83E+03	2.05E+00	7.51E+00	6.83E-01	5.53E+01	1.37E+00	1.15E+02	2.73E+00	1.37E+00	1.56E+03	7.78E-01	1.09E+02	3.89E-02	7.78E-01	7.78E-01	7.78E-01	7.00E+02	7.78E-01
I-710, Willow to 405	1.03E+04	3.09E+00	1.13E+01	1.03E+00	8.34E+01	2.06E+00	1.74E+02	4.12E+00	2.06E+00	2.35E+03	1.17E+00	1.64E+02	5.86E-02	1.17E+00	1.17E+00	1.17E+00	1.06E+03	1.17E+00
I-710, 405 to Del Amo	9.42E+03	2.83E+00	1.04E+01	9.42E-01	7.63E+01	1.88E+00	1.59E+02	3.77E+00	1.88E+00	2.15E+03	1.07E+00	1.50E+02	5.37E-02	1.07E+00	1.07E+00	1.07E+00	9.67E+02	1.07E+00
I-710, Del Amo to Long Beach Blvd Interchange	7.71E+03	2.31E+00	8.48E+00	7.71E-01	6.25E+01	1.54E+00	1.30E+02	3.08E+00	1.54E+00	1.76E+03	8.79E-01	1.23E+02	4.39E-02	8.79E-01	8.79E-01	8.79E-01	7.91E+02	8.79E-01
I-710, Long Beach Boulevard to SR-91	6.27E+03	1.88E+00	6.90E+00	6.27E-01	5.08E+01	1.25E+00	1.06E+02	2.51E+00	1.25E+00	1.43E+03	7.15E-01	1.00E+02	3.57E-02	7.15E-01	7.15E-01	7.15E-01	6.43E+02	7.15E-01
PCH, I-110 to Alameda	6.94E+02	2.08E-01	7.63E-01	6.94E-02	5.62E+00	1.39E-01	1.17E+01	2.78E-01	1.39E-01	1.58E+02	7.91E-02	1.11E+01	3.95E-03	7.91E-02	7.91E-02	7.91E-02	7.12E+01	7.91E-02
PCH, Alameda to SR-103	5.23E+01	1.57E-02	5.75E-02	5.23E-03	4.24E-01	1.05E-02	8.84E-01	2.09E-02	1.05E-02	1.19E+01	5.96E-03	8.35E-01	2.98E-04	5.96E-03	5.96E-03	5.96E-03	5.37E+00	5.96E-03
PCH, SR-103 to I-710	6.97E+02	2.09E-01	7.66E-01	6.97E-02	5.64E+00	1.39E-01	1.18E+01	2.79E-01	1.39E-01	1.59E+02	7.94E-02	1.11E+01	3.97E-03	7.94E-02	7.94E-02	7.94E-02	7.15E+01	7.94E-02
Sepulveda, I-110 to Avalon	6.25E+01	1.87E-02	6.87E-02	6.25E-03	5.06E-01	1.25E-02	1.06E+00	2.50E-02	1.25E-02	1.42E+01	7.12E-03	9.97E-01	3.56E-04	7.12E-03	7.12E-03	7.12E-03	6.41E+00	7.12E-03
Sepulveda, Avalon to Alameda	4.41E+01	1.32E-02	4.85E-02	4.41E-03	3.57E-01	8.82E-03	7.46E-01	1.76E-02	8.82E-03	1.01E+01	5.03E-03	7.04E-01	2.51E-04	5.03E-03	5.03E-03	5.03E-03	4.52E+00	5.03E-03
Sepulveda, Alameda to ICTF	1.23E+02	3.68E-02	1.35E-01	1.23E-02	9.93E-01	2.45E-02	2.07E+00	4.90E-02	2.45E-02	2.79E+01	1.40E-02	1.96E+00	6.99E-04	1.40E-02	1.40E-02	1.40E-02	1.26E+01	1.40E-02
Sepulveda, ICTF to SR-103	1.13E+02	3.40E-02	1.25E-01	1.13E-02	9.17E-01	2.26E-02	1.91E+00	4.53E-02	2.26E-02	2.58E+01	1.29E-02	1.81E+00	6.45E-04	1.29E-02	1.29E-02	1.29E-02	1.16E+01	1.29E-02
Del Amo, I-110 to Wilmington	5.12E+01	1.54E-02	5.63E-02	5.12E-03	4.15E-01	1.02E-02	8.66E-01	2.05E-02	1.02E-02	1.17E+01	5.84E-03	8.17E-01	2.92E-04	5.84E-03	5.84E-03	5.84E-03	5.25E+00	5.84E-03
Del Amo, Wilmington to Alameda	1.83E+02	5.49E-02	2.01E-01	1.83E-02	1.48E+00	3.66E-02	3.09E+00	7.32E-02	3.66E-02	4.17E+01	2.08E-02	2.92E+00	1.04E-03	2.08E-02	2.08E-02	2.08E-02	1.88E+01	2.08E-02
Del Amo, Alameda to I-710	1.15E+02	3.45E-02	1.27E-01	1.15E-02	9.33E-01	2.30E-02	1.95E+00	4.61E-02	2.30E-02	2.62E+01	1.31E-02	1.84E+00	6.56E-04	1.31E-02	1.31E-02	1.31E-02	1.18E+01	1.31E-02
223rd Street, I-110 to Avalon	1.93E+01	5.79E-03	2.12E-02	1.93E-03	1.56E-01	3.86E-03	3.26E-01	7.72E-03	3.86E-03	4.40E+00	2.20E-03	3.08E-01	1.10E-04	2.20E-03	2.20E-03	2.20E-03	1.98E+00	2.20E-03
223rd Street, Avalon to Wilmington	2.03E+01	6.08E-03	2.23E-02	2.03E-03	1.64E-01	4.05E-03	3.42E-01	8.10E-03	4.05E-03	4.62E+00	2.31E-03	3.23E-01	1.15E-04	2.31E-03	2.31E-03	2.31E-03	2.08E+00	2.31E-03
223rd Street, Wilmington to Alameda	1.52E+02	4.55E-02	1.67E-01	1.52E-02	1.23E+00	3.04E-02	2.56E+00	6.07E-02	3.04E-02	3.46E+01	1.73E-02	2.42E+00	8.65E-04	1.73E-02	1.73E-02	1.73E-02	1.56E+01	1.73E-02
W Wardlow from Alameda to I-710	2.69E+02	8.08E-02	2.96E-01	2.69E-02	2.18E+00	5.39E-02	4.55E+00	1.08E-01	5.39E-02	6.14E+01	3.07E-02	4.30E+00	1.54E-03	3.07E-02	3.07E-02	3.07E-02	2.76E+01	3.07E-02

Table B-6
2030 Alternative 2
Annual Average Truck Emissions

	SCAG - Gasoline Trucks					
	TOG	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
		71432	50000	106990	75070	107028
2030 Alternative 2	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to HF Ramps	9.81E-01	2.07E-02	1.33E-02	4.57E-03	2.40E-03	1.11E-03
Henry Ford Ramps	5.62E-02	1.19E-03	7.65E-04	2.62E-04	1.38E-04	6.35E-05
Henry Ford n/o Ramps to Alameda	3.87E+00	8.15E-02	5.26E-02	1.80E-02	9.47E-03	4.37E-03
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.48E+00	3.11E-02	2.01E-02	6.88E-03	3.62E-03	1.67E-03
SR-103 Anaheim to PCH	2.18E+00	4.59E-02	2.96E-02	1.02E-02	5.34E-03	2.46E-03
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	3.12E+00	6.58E-02	4.24E-02	1.45E-02	7.64E-03	3.53E-03
SR-103 Ramps south of Sepulveda/Willow	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NB Sepulveda Ramp (G2 Line)	6.86E-01	1.45E-02	9.33E-03	3.19E-03	1.68E-03	7.75E-04
SB Sepulveda Ramp (F2 Ramp)	4.83E-01	1.02E-02	6.56E-03	2.25E-03	1.18E-03	5.45E-04
SR-103 Existing, End Ramps to Sepulveda/Willow	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB Sepulveda Ramp Traffic	8.89E-02	1.87E-03	1.21E-03	4.14E-04	2.18E-04	1.00E-04
SB+NB Sepulveda Ramp Traffic	3.49E-01	7.36E-03	4.75E-03	1.63E-03	8.56E-04	3.95E-04
SR-103, Realignment to End (223rd/Wardlow)	6.75E+00	1.42E-01	9.18E-02	3.14E-02	1.65E-02	7.63E-03
E and W Harry Bridges, Figueroa to start Alameda	5.07E+00	1.07E-01	6.90E-02	2.36E-02	1.24E-02	5.73E-03
Alameda beginning (E Harry Bridges) to Anaheim	6.43E+00	1.36E-01	8.74E-02	3.00E-02	1.58E-02	7.27E-03
Alameda Anaheim to Henry Ford	3.60E+00	7.58E-02	4.89E-02	1.68E-02	8.81E-03	4.06E-03
Alameda, Henry Ford to PCH	2.98E+00	6.29E-02	4.06E-02	1.39E-02	7.31E-03	3.37E-03
Alameda PCH to 405	4.35E+01	9.16E-01	5.91E-01	2.02E-01	1.06E-01	4.91E-02
Alameda 405 to del Amo	3.07E+01	6.47E-01	4.17E-01	1.43E-01	7.51E-02	3.47E-02
Alameda, del Amo to South Santa Fe Avenue	1.10E+01	2.33E-01	1.50E-01	5.14E-02	2.70E-02	1.25E-02
Alameda, South Santa Fe Avenue to SR-91	1.20E+01	2.53E-01	1.63E-01	5.59E-02	2.94E-02	1.36E-02
I-110, "C" Street Interchange to Anaheim	1.42E+01	2.99E-01	1.93E-01	6.62E-02	3.48E-02	1.61E-02
I-110, Anaheim to PCH	2.66E+01	5.60E-01	3.61E-01	1.24E-01	6.51E-02	3.00E-02
1-110, PCH to Sepulveda	6.50E+01	1.37E+00	8.84E-01	3.03E-01	1.59E-01	7.34E-02
I-110, Sepulveda to Carson	1.10E+02	2.31E+00	1.49E+00	5.10E-01	2.68E-01	1.24E-01
I-110, Carson to Del Amo	7.50E+01	1.58E+00	1.02E+00	3.49E-01	1.84E-01	8.47E-02
I-110, Del Amo to 405	6.20E+01	1.31E+00	8.44E-01	2.89E-01	1.52E-01	7.01E-02
I-110, 405 to SR-91	1.31E+02	2.77E+00	1.79E+00	6.12E-01	3.22E-01	1.48E-01
I-710, Anaheim to PCH	1.86E+01	3.92E-01	2.53E-01	8.65E-02	4.55E-02	2.10E-02
I-710, PCH to Willow	4.07E+01	8.57E-01	5.53E-01	1.89E-01	9.96E-02	4.60E-02
I-710, Willow to 405	6.31E+01	1.33E+00	8.58E-01	2.94E-01	1.55E-01	7.13E-02
I-710, 405 to Del Amo	8.91E+01	1.88E+00	1.21E+00	4.15E-01	2.18E-01	1.01E-01
I-710, Del Amo to Long Beach Blvd Interchange	7.97E+01	1.68E+00	1.08E+00	3.71E-01	1.95E-01	9.01E-02
I-710, Long Beach Boulevard to SR-91	9.66E+01	2.04E+00	1.31E+00	4.50E-01	2.37E-01	1.09E-01
PCH, I-110 to Alameda	3.00E+01	6.33E-01	4.08E-01	1.40E-01	7.36E-02	3.39E-02
PCH, Alameda to SR-103	4.93E+00	1.04E-01	6.71E-02	2.30E-02	1.21E-02	5.57E-03
PCH, SR-103 to I-710	8.73E+00	1.84E-01	1.19E-01	4.07E-02	2.14E-02	9.87E-03
Sepulveda, I-110 to Avalon	1.28E+01	2.69E-01	1.74E-01	5.96E-02	3.13E-02	1.44E-02
Sepulveda, Avalon to Alameda	1.94E+01	4.09E-01	2.64E-01	9.04E-02	4.75E-02	2.19E-02
Sepulveda, Alameda to ICTF	2.48E+00	5.23E-02	3.37E-02	1.16E-02	6.07E-03	2.80E-03
Sepulveda, ICTF to SR-103	4.89E-01	1.03E-02	6.65E-03	2.28E-03	1.20E-03	5.53E-04
Del Amo, I-110 to Wilmington	2.97E+01	6.27E-01	4.04E-01	1.38E-01	7.28E-02	3.36E-02
Del Amo, Wilmington to Alameda	1.69E+01	3.57E-01	2.30E-01	7.89E-02	4.15E-02	1.91E-02
Del Amo, Alameda to I-710	2.02E+01	4.25E-01	2.74E-01	9.39E-02	4.94E-02	2.28E-02
223rd Street, I-110 to Avalon	1.01E+01	2.13E-01	1.37E-01	4.70E-02	2.47E-02	1.14E-02
223rd Street, Avalon to Wilmington	7.86E+00	1.66E-01	1.07E-01	3.66E-02	1.93E-02	8.88E-03
223rd Street, Wilmington to Alameda	8.58E+00	1.81E-01	1.17E-01	4.00E-02	2.10E-02	9.70E-03
W Wardlow from Alameda to I-710	1.84E+01	3.87E-01	2.50E-01	8.55E-02	4.50E-02	2.07E-02

Table B-7
2015 No Build
Maximum Hourly Truck Emissions

	Length	Cong Speed	Port Peak Hour trucks	SCAG Peak Hour trucks	Port Peak hr LNG trucks	Port Peak hr Dsl trucks	SCAG Peak hr Gas trucks	SCAG Peak hr Dsl trucks
Baseline 2015	mile	mph	veh/hr	veh/hr	veh/hr	veh/hr	veh/hr	veh/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	0.75	40	1825	9	730	1095	5	4
Henry Ford Ramps	0.15	15	846	0	338	508	0	0
Henry Ford n/o Ramps to Alameda	0.68	15	878	0	351	527	0	0
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	0.95	40	978	9	391	587	5	4
SR-103 Anaheim to PCH	0.57	40	977	20	391	586	10	10
SR-103 PCH to Sepulveda/Willow	1.02	40	483	27	193	290	14	13
E and W Harry Bridges, Figueroa to start Alameda	1.44	25	418	18	167	251	9	9
Alameda beginning (E Harry Bridges) to Anaheim	0.77	25	525	47	210	315	25	22
Alameda Anaheim to Henry Ford	0.42	25	337	51	135	202	27	24
Alameda Henry Ford to PCH	0.34	25	1139	52	456	683	27	25
Alameda PCH to 405	2.27	35	1243	185	497	746	97	88
Alameda 405 to del Amo	1.72	40	849	227	340	509	119	108
Alameda, del Amo to South Santa Fe Avenue	0.84	40	594	178	238	356	93	85
Alameda, South Santa Fe Avenue to SR-91	1.15	40	438	138	175	263	72	66
I-110, "C" Street Interchange to Anaheim	0.49	45	1546	290	618	928	152	138
I-110, Anaheim to PCH	0.80	45	1553	330	621	932	173	157
1-110, PCH to Sepulveda	1.39	45	1551	418	620	931	219	199
I-110, Sepulveda to Carson	1.56	45	1447	528	579	868	276	252
I-110, Carson to Del Amo	1.02	45	1379	607	552	827	317	290
I-110, Del Amo to 405	0.74	45	1337	717	535	802	375	342
I-110, 405 to SR-91	1.09	45	1126	1096	450	676	573	523
I-710, Anaheim to PCH	0.50	40	3289	241	1316	1973	126	115
I-710, PCH to Willow	1.01	40	3525	287	1410	2115	150	137
I-710, Willow to 405	1.52	40	3508	296	1403	2105	155	141
I-710, 405 to Del Amo	1.42	40	3196	487	1278	1918	255	232
I-710, Del Amo to Long Beach Blvd Interchange	1.17	40	3109	530	1244	1865	277	253
I-710, Long Beach Boulevard to SR-91	0.96	40	3083	775	1233	1850	405	370
PCH, I110 to Alameda	2.38	20	172	140	69	103	73	67
PCH, Alameda to SR-103	0.94	20	151	69	60	91	36	33
PCH, SR-103 to I-710	0.98	20	661	52	264	397	27	25
Sepulveda, I-110 to Avalon	1.37	25	50	75	20	30	39	36
Sepulveda, Avalon to Alameda	1.70	25	89	89	36	53	47	42
Sepulveda, Alameda to ICTF	0.67	25	273	34	109	164	18	16
Sepulveda, ICTF to SR-103	0.17	25	483	29	193	290	15	14
Del Amo, I-110 to Wilmington	2.96	25	29	65	12	17	34	31
Del Amo, Wilminton to Alameda	0.77	25	108	168	43	65	88	80
Del Amo, Alameda to I-710	0.87	25	84	173	34	50	90	83
223rd Street, I-110 to Avalon	1.36	25	7	72	3	4	38	34
223rd Street, Avalon to Wilmington	1.23	25	4	69	2	2	36	33
223rd Street, Wilmington to Alameda	0.79	25	92	153	37	55	80	73
W Wardlow from Alameda to I-710	1.30	25	26	94	10	16	49	45

Table B-7
2015 No Build
Maximum Hourly Truck Emissions

	Port - LNG Trucks				Port - Diesel Trucks		SCAG Gasoline Trucks	SCAG - Diesel Trucks	
	LNG Exhst TOG	LNG Exhst Dsl TOG	LNG Exhst PM	LNG Exhst DPM	Dsl Exhst TOG	Dsl Exhst Dsl PM	TOG	Dsl Exhst Dsl TOG	Dsl Exhst DPM
Baseline 2015	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi
SR-47 Mainline, New Dock Ramps to HF Ramps	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
Henry Ford Ramps	0.5904	0.0311	0.0918	0.0048	0.787	0.060	0.763	1.314	0.153
Henry Ford n/o Ramps to Alameda	0.5904	0.0311	0.0918	0.0048	0.787	0.060	0.763	1.314	0.153
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
SR-103 Anaheim to PCH	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
SR-103 PCH to Sepulveda/Willow	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
E and W Harry Bridges, Figueroa to start Alameda	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
Alameda beginning (E Harry Bridges) to Anaheim	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
Alameda Anaheim to Henry Ford	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
Alameda Henry Ford to PCH	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
Alameda PCH to 405	0.5904	0.0311	0.0918	0.0048	0.308	0.058	0.252	0.437	0.115
Alameda 405 to del Amo	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
Alameda, del Amo to South Santa Fe Avenue	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
Alameda, South Santa Fe Avenue to SR-91	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
I-110, "C" Street Interchange to Anaheim	0.5904	0.0311	0.0918	0.0048	0.240	0.070	0.186	0.349	0.126
I-110, Anaheim to PCH	0.5904	0.0311	0.0918	0.0048	0.240	0.070	0.186	0.349	0.126
1-110, PCH to Sepulveda	0.5904	0.0311	0.0918	0.0048	0.240	0.070	0.186	0.349	0.126
I-110, Sepulveda to Carson	0.5904	0.0311	0.0918	0.0048	0.240	0.070	0.186	0.349	0.126
I-110, Carson to Del Amo	0.5904	0.0311	0.0918	0.0048	0.240	0.070	0.186	0.349	0.126
I-110, Del Amo to 405	0.5904	0.0311	0.0918	0.0048	0.240	0.070	0.186	0.349	0.126
I-110, 405 to SR-91	0.5904	0.0311	0.0918	0.0048	0.240	0.070	0.186	0.349	0.126
I-710, Anaheim to PCH	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
I-710, PCH to Willow	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
I-710, Willow to 405	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
I-710, 405 to Del Amo	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
I-710, Del Amo to Long Beach Blvd Interchange	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
I-710, Long Beach Boulevard to SR-91	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
PCH, I110 to Alameda	0.5904	0.0311	0.0918	0.0048	0.463	0.056	0.544	0.756	0.134
PCH, Alameda to SR-103	0.5904	0.0311	0.0918	0.0048	0.463	0.056	0.544	0.756	0.134
PCH, SR-103 to I-710	0.5904	0.0311	0.0918	0.0048	0.463	0.056	0.544	0.756	0.134
Sepulveda, I-110 to Avalon	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
Sepulveda, Avalon to Alameda	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
Sepulveda, Alameda to ICTF	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
Sepulveda, ICTF to SR-103	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
Del Amo, I-110 to Wilmington	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
Del Amo, Wilminton to Alameda	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
Del Amo, Alameda to I-710	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
223rd Street, I-110 to Avalon	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
223rd Street, Avalon to Wilmington	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
223rd Street, Wilmington to Alameda	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
W Wardlow from Alameda to I-710	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122

Table B-7
2015 No Build
Maximum Hourly Truck Emissions

	Port		Port		SCAG	SCAG	
	LNG TOG	LNG PM	Dsl + LNG Dsl TOG	Dsl + LNG DPM	Gasoline TOG	Dsl Exhst TOG	Dsl Exhst PM
Baseline 2015	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	0.709	0.110	0.52	0.12	0.00	0.00	0.00
Henry Ford Ramps	0.067	0.010	0.14	0.01	0.00	0.00	0.00
Henry Ford n/o Ramps to Alameda	0.313	0.049	0.64	0.05	0.00	0.00	0.00
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	0.483	0.075	0.36	0.08	0.00	0.00	0.00
SR-103 Anaheim to PCH	0.292	0.045	0.22	0.05	0.00	0.00	0.00
SR-103 PCH to Sepulveda/Willow	0.256	0.040	0.19	0.04	0.01	0.01	0.00
E and W Harry Bridges, Figueroa to start Alameda	0.314	0.049	0.34	0.05	0.01	0.02	0.00
Alameda beginning (E Harry Bridges) to Anaheim	0.210	0.033	0.23	0.03	0.02	0.02	0.00
Alameda Anaheim to Henry Ford	0.074	0.012	0.08	0.01	0.01	0.01	0.00
Alameda Henry Ford to PCH	0.204	0.032	0.22	0.03	0.01	0.01	0.00
Alameda PCH to 405	1.467	0.228	1.23	0.23	0.12	0.19	0.05
Alameda 405 to del Amo	0.761	0.118	0.56	0.13	0.10	0.16	0.05
Alameda, del Amo to South Santa Fe Avenue	0.260	0.040	0.19	0.04	0.04	0.06	0.02
Alameda, South Santa Fe Avenue to SR-91	0.263	0.041	0.19	0.04	0.04	0.06	0.02
I-110, "C" Street Interchange to Anaheim	0.396	0.062	0.26	0.07	0.03	0.05	0.02
I-110, Anaheim to PCH	0.649	0.101	0.43	0.12	0.06	0.10	0.04
1-110, PCH to Sepulveda	1.119	0.174	0.74	0.21	0.12	0.21	0.08
I-110, Sepulveda to Carson	1.173	0.182	0.78	0.22	0.18	0.30	0.11
I-110, Carson to Del Amo	0.734	0.114	0.49	0.14	0.13	0.23	0.08
I-110, Del Amo to 405	0.516	0.080	0.34	0.10	0.11	0.19	0.07
I-110, 405 to SR-91	0.641	0.100	0.42	0.12	0.26	0.44	0.16
I-710, Anaheim to PCH	0.855	0.133	0.63	0.14	0.03	0.05	0.02
I-710, PCH to Willow	1.845	0.287	1.36	0.31	0.07	0.12	0.04
I-710, Willow to 405	2.782	0.432	2.05	0.47	0.11	0.18	0.06
I-710, 405 to Del Amo	2.362	0.367	1.74	0.40	0.17	0.28	0.09
I-710, Del Amo to Long Beach Blvd Interchange	1.901	0.295	1.40	0.32	0.15	0.25	0.08
I-710, Long Beach Boulevard to SR-91	1.543	0.240	1.14	0.26	0.18	0.30	0.09
PCH, I110 to Alameda	0.213	0.033	0.26	0.03	0.21	0.26	0.05
PCH, Alameda to SR-103	0.074	0.012	0.09	0.01	0.04	0.05	0.01
PCH, SR-103 to I-710	0.338	0.052	0.42	0.05	0.03	0.04	0.01
Sepulveda, I-110 to Avalon	0.036	0.006	0.04	0.01	0.05	0.07	0.01
Sepulveda, Avalon to Alameda	0.079	0.012	0.08	0.01	0.07	0.10	0.02
Sepulveda, Alameda to ICTF	0.096	0.015	0.10	0.01	0.01	0.02	0.00
Sepulveda, ICTF to SR-103	0.043	0.007	0.05	0.01	0.00	0.00	0.00
Del Amo, I-110 to Wilmington	0.045	0.007	0.05	0.01	0.09	0.13	0.02
Del Amo, Wilminton to Alameda	0.043	0.007	0.05	0.01	0.06	0.08	0.02
Del Amo, Alameda to I-710	0.038	0.006	0.04	0.01	0.07	0.10	0.02
223rd Street, I-110 to Avalon	0.005	0.001	0.01	0.00	0.05	0.06	0.01
223rd Street, Avalon to Wilmington	0.003	0.000	0.00	0.00	0.04	0.06	0.01
223rd Street, Wilmington to Alameda	0.038	0.006	0.04	0.01	0.06	0.08	0.02
W Wardlow from Alameda to I-710	0.018	0.003	0.02	0.00	0.06	0.08	0.02

Table B-7
2015 No Build
Maximum Hourly Truck Emissions

	Maximum Hourly Toxic Emissions from Trucks														
	DPM	Acetaldehyde	Acrolein	Ammonia	Antimony	Arsenic	Benzene	Bromine	1,3-Butadiene	Cadmium	Chlorine	Chromium (hex)	Copper	Ethylbenzene	Formaldehyde
	9901	75070	107028	7664417	7440360	7440382	71432	7726956	106990	7440439	7782505	18540299	7440508	100414	50000
Baseline 2015	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	1.20E-01	3.87E-02	2.16E-06	4.04E-04	4.32E-06	6.00E-07	1.06E-02	4.32E-06	1.01E-03	4.80E-06	4.13E-05	7.20E-08	3.00E-06	1.60E-03	7.74E-02
Henry Ford Ramps	1.08E-02	1.01E-02	0.00E+00	3.63E-05	3.88E-07	5.39E-08	2.74E-03	3.88E-07	2.60E-04	4.31E-07	3.71E-06	6.47E-09	2.69E-07	4.18E-04	2.02E-02
Henry Ford n/o Ramps to Alameda	5.05E-02	4.72E-02	0.00E+00	1.70E-04	1.82E-06	2.53E-07	1.29E-02	1.82E-06	1.22E-03	2.02E-06	1.74E-05	3.03E-08	1.26E-06	1.96E-03	9.45E-02
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	8.22E-02	2.65E-02	2.74E-06	2.77E-04	2.96E-06	4.11E-07	7.25E-03	2.96E-06	6.95E-04	3.29E-06	2.83E-05	4.93E-08	2.06E-06	1.10E-03	5.30E-02
SR-103 Anaheim to PCH	5.05E-02	1.62E-02	3.69E-06	1.70E-04	1.82E-06	2.53E-07	4.47E-03	1.82E-06	4.34E-04	2.02E-06	1.74E-05	3.03E-08	1.26E-06	6.71E-04	3.24E-02
SR-103 PCH to Sepulveda/Willow	4.65E-02	1.47E-02	8.84E-06	1.57E-04	1.67E-06	2.33E-07	4.17E-03	1.67E-06	4.18E-04	1.86E-06	1.60E-05	2.79E-08	1.16E-06	6.11E-04	2.96E-02
E and W Harry Bridges, Figueroa to start Alameda	4.90E-02	2.62E-02	1.58E-05	1.65E-04	1.76E-06	2.45E-07	7.42E-03	1.76E-06	7.43E-04	1.96E-06	1.69E-05	2.94E-08	1.23E-06	1.09E-03	5.26E-02
Alameda beginning (E Harry Bridges) to Anaheim	3.52E-02	1.85E-02	2.20E-05	1.19E-04	1.27E-06	1.76E-07	5.43E-03	1.27E-06	5.70E-04	1.41E-06	1.21E-05	2.11E-08	8.81E-07	7.65E-04	3.72E-02
Alameda Anaheim to Henry Ford	1.35E-02	6.95E-03	1.31E-05	4.56E-05	4.87E-07	6.76E-08	2.12E-03	4.87E-07	2.34E-04	5.41E-07	4.65E-06	8.11E-09	3.38E-07	2.87E-04	1.40E-02
Alameda Henry Ford to PCH	3.19E-02	1.71E-02	1.09E-05	1.08E-04	1.15E-06	1.60E-07	4.84E-03	1.15E-06	4.86E-04	1.28E-06	1.10E-05	1.92E-08	7.98E-07	7.06E-04	3.42E-02
Alameda PCH to 405	2.77E-01	1.05E-01	1.60E-04	9.35E-04	9.99E-06	1.39E-06	3.13E-02	9.99E-06	3.37E-03	1.11E-05	9.55E-05	1.66E-07	6.94E-06	4.32E-03	2.11E-01
Alameda 405 to del Amo	1.77E-01	5.32E-02	1.26E-04	5.96E-04	6.37E-06	8.84E-07	1.67E-02	6.37E-06	1.90E-03	7.08E-06	6.08E-05	1.06E-07	4.42E-06	2.19E-03	1.07E-01
Alameda, del Amo to South Santa Fe Avenue	6.25E-02	1.87E-02	4.81E-05	2.10E-04	2.25E-06	3.12E-07	5.94E-03	2.25E-06	6.82E-04	2.50E-06	2.15E-05	3.75E-08	1.56E-06	7.69E-04	3.77E-02
Alameda, South Santa Fe Avenue to SR-91	6.42E-02	1.91E-02	5.11E-05	2.16E-04	2.31E-06	3.21E-07	6.11E-03	2.31E-06	7.06E-04	2.57E-06	2.21E-05	3.85E-08	1.60E-06	7.87E-04	3.86E-02
I-110, "C" Street Interchange to Anaheim	9.28E-02	2.33E-02	4.01E-05	3.13E-04	3.34E-06	4.64E-07	7.04E-03	3.34E-06	7.67E-04	3.71E-06	3.19E-05	5.57E-08	2.32E-06	9.60E-04	4.68E-02
I-110, Anaheim to PCH	1.56E-01	3.90E-02	7.45E-05	5.27E-04	5.63E-06	7.82E-07	1.19E-02	5.63E-06	1.32E-03	6.25E-06	5.38E-05	9.38E-08	3.91E-06	1.61E-03	7.86E-02
1-110, PCH to Sepulveda	2.86E-01	7.06E-02	1.63E-04	9.63E-04	1.03E-05	1.43E-06	2.21E-02	1.03E-05	2.50E-03	1.14E-05	9.83E-05	1.72E-07	7.15E-06	2.91E-03	1.43E-01
I-110, Sepulveda to Carson	3.28E-01	8.00E-02	2.31E-04	1.11E-03	1.18E-05	1.64E-06	2.59E-02	1.18E-05	3.03E-03	1.31E-05	1.13E-04	1.97E-07	8.20E-06	3.29E-03	1.62E-01
I-110, Carson to Del Amo	2.19E-01	5.30E-02	1.74E-04	7.39E-04	7.89E-06	1.10E-06	1.75E-02	7.89E-06	2.09E-03	8.77E-06	7.54E-05	1.32E-07	5.48E-06	2.18E-03	1.07E-01
I-110, Del Amo to 405	1.67E-01	3.99E-02	1.49E-04	5.62E-04	6.01E-06	8.34E-07	1.35E-02	6.01E-06	1.65E-03	6.67E-06	5.74E-05	1.00E-07	4.17E-06	1.64E-03	8.09E-02
I-110, 405 to SR-91	2.79E-01	6.45E-02	3.37E-04	9.39E-04	1.00E-05	1.39E-06	2.35E-02	1.00E-05	3.06E-03	1.11E-05	9.59E-05	1.67E-07	6.97E-06	2.64E-03	1.32E-01
I-710, Anaheim to PCH	1.59E-01	5.01E-02	3.87E-05	5.36E-04	5.72E-06	7.95E-07	1.43E-02	5.72E-06	1.46E-03	6.36E-06	5.47E-05	9.54E-08	3.97E-06	2.07E-03	1.01E-01
I-710, PCH to Willow	3.47E-01	1.09E-01	9.27E-05	1.17E-03	1.25E-05	1.73E-06	3.13E-02	1.25E-05	3.20E-03	1.39E-05	1.19E-04	2.08E-07	8.66E-06	4.51E-03	2.19E-01
I-710, Willow to 405	5.24E-01	1.65E-01	1.45E-04	1.77E-03	1.89E-05	2.62E-06	4.74E-02	1.89E-05	4.86E-03	2.10E-05	1.80E-04	3.15E-07	1.31E-05	6.82E-03	3.31E-01
I-710, 405 to Del Amo	4.84E-01	1.49E-01	2.22E-04	1.63E-03	1.74E-05	2.42E-06	4.46E-02	1.74E-05	4.78E-03	1.94E-05	1.66E-04	2.90E-07	1.21E-05	6.17E-03	3.00E-01
I-710, Del Amo to Long Beach Blvd Interchange	3.98E-01	1.22E-01	2.00E-04	1.34E-03	1.43E-05	1.99E-06	3.68E-02	1.43E-05	3.98E-03	1.59E-05	1.37E-04	2.39E-07	9.94E-06	5.04E-03	2.46E-01
I-710, Long Beach Boulevard to SR-91	3.53E-01	1.06E-01	2.39E-04	1.19E-03	1.27E-05	1.76E-06	3.32E-02	1.27E-05	3.74E-03	1.41E-05	1.21E-04	2.12E-07	8.82E-06	4.38E-03	2.15E-01
PCH, I110 to Alameda	7.87E-02	3.95E-02	2.74E-04	2.65E-04	2.83E-06	3.94E-07	1.56E-02	2.83E-06	2.16E-03	3.15E-06	2.71E-05	4.72E-08	1.97E-06	1.61E-03	8.11E-02
PCH, Alameda to SR-103	2.02E-02	1.06E-02	5.34E-05	6.81E-05	7.28E-07	1.01E-07	3.85E-03	7.28E-07	4.96E-04	8.09E-07	6.96E-06	1.21E-08	5.06E-07	4.35E-04	2.17E-02
PCH, SR-103 to I-710	5.78E-02	3.36E-02	4.19E-05	1.95E-04	2.08E-06	2.89E-07	9.90E-03	2.08E-06	1.04E-03	2.31E-06	1.99E-05	3.47E-08	1.45E-06	1.39E-03	6.76E-02
Sepulveda, I-110 to Avalon	1.84E-02	7.97E-03	6.26E-05	6.19E-05	6.61E-07	9.18E-08	3.28E-03	6.61E-07	4.65E-04	7.35E-07	6.32E-06	1.10E-08	4.59E-07	3.23E-04	1.64E-02
Sepulveda, Avalon to Alameda	3.09E-02	1.38E-02	9.21E-05	1.04E-04	1.11E-06	1.54E-07	5.40E-03	1.11E-06	7.39E-04	1.23E-06	1.06E-05	1.85E-08	7.72E-07	5.62E-04	2.83E-02
Sepulveda, Alameda to ICTF	1.69E-02	8.75E-03	1.40E-05	5.69E-05	6.08E-07	8.44E-08	2.63E-03	6.08E-07	2.84E-04	6.75E-07	5.81E-06	1.01E-08	4.22E-07	3.61E-04	1.76E-02
Sepulveda, ICTF to SR-103	6.90E-03	3.67E-03	3.03E-06	2.33E-05	2.49E-07	3.45E-08	1.05E-03	2.49E-07	1.07E-04	2.76E-07	2.37E-06	4.14E-09	1.73E-07	1.52E-04	7.36E-03
Del Amo, I-110 to Wilmington	3.12E-02	1.32E-02	1.17E-04	1.05E-04	1.12E-06	1.56E-07	5.67E-03	1.12E-06	8.26E-04	1.25E-06	1.07E-05	1.87E-08	7.80E-07	5.32E-04	2.72E-02
Del Amo, Wilminton to Alameda	2.28E-02	9.85E-03	7.84E-05	7.67E-05	8.20E-07	1.14E-07	4.07E-03	8.20E-07	5.79E-04	9.11E-07	7.84E-06	1.37E-08	5.69E-07	3.99E-04	2.03E-02
Del Amo, Alameda to I-710	2.49E-02	1.06E-02	9.19E-05	8.40E-05	8.97E-07	1.25E-07	4.51E-03	8.97E-07	6.54E-04	9.97E-07	8.57E-06	1.50E-08	6.23E-07	4.28E-04	2.18E-02
223rd Street, I-110 to Avalon	1.33E-02	5.31E-03	5.98E-05	4.49E-05	4.80E-07	6.66E-08	2.51E-03	4.80E-07	3.85E-04	5.33E-07	4.58E-06	8.00E-09	3.33E-07	2.13E-04	1.10E-02
223rd Street, Avalon to Wilmington	1.12E-02	4.43E-03	5.15E-05	3.78E-05	4.04E-07	5.62E-08	2.12E-03	4.04E-07	3.28E-04	4.49E-07	3.86E-06	6.74E-09	2.81E-07	1.78E-04	9.24E-03
223rd Street, Wilmington to Alameda	2.10E-02	9.04E-03	7.36E-05	7.08E-05	7.56E-07	1.05E-07	3.77E-03	7.56E-07	5.39E-04	8.40E-07	7.22E-06	1.26E-08	5.25E-07	3.66E-04	1.86E-02
W Wardlow from Alameda to I-710	1.83E-02	7.51E-03	7.44E-05	6.15E-05	6.57E-07	9.13E-08	3.37E-03	6.57E-07	5.03E-04	7.30E-07	6.28E-06	1.10E-08	4.56E-07	3.02E-04	1.56E-02

Table B-7
2015 No Build
Maximum Hourly Truck Emissions

	Maximum Hourly Toxic Emissions from Trucks (continued)														
	n-Hexane	Lead	Manganese	MEK	Mercury	Methanol	Nickel	Propylene	Selenium	Sthrene	Sulfates	Toluene	Vanadium	Xylene	Zinc
	110543	7439921	7439965	78933	7439976	67561	7440020	115071	7782492	100425	9960	108883	7440622	1330207	7440666
Baseline 2015	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	8.26E-04	5.04E-06	4.80E-06	7.77E-03	3.60E-06	1.58E-04	2.28E-06	1.37E-02	1.20E-06	3.05E-04	2.09E-03	7.75E-03	3.48E-06	5.48E-03	5.26E-05
Henry Ford Ramps	2.15E-04	4.53E-07	4.31E-07	2.02E-03	3.23E-07	4.11E-05	2.05E-07	3.56E-03	1.08E-07	7.95E-05	1.88E-04	2.02E-03	3.13E-07	1.43E-03	4.72E-06
Henry Ford n/o Ramps to Alameda	1.01E-03	2.12E-06	2.02E-06	9.49E-03	1.52E-06	1.93E-04	9.60E-07	1.67E-02	5.05E-07	3.73E-04	8.79E-04	9.46E-03	1.46E-06	6.69E-03	2.21E-05
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	5.65E-04	3.45E-06	3.29E-06	5.31E-03	2.47E-06	1.08E-04	1.56E-06	9.34E-03	8.22E-07	2.09E-04	1.43E-03	5.30E-03	2.38E-06	3.75E-03	3.60E-05
SR-103 Anaheim to PCH	3.46E-04	2.12E-06	2.02E-06	3.25E-03	1.52E-06	6.60E-05	9.60E-07	5.72E-03	5.05E-07	1.28E-04	8.79E-04	3.24E-03	1.46E-06	2.29E-03	2.21E-05
SR-103 PCH to Sepulveda/Willow	3.14E-04	1.95E-06	1.86E-06	2.96E-03	1.40E-06	6.01E-05	8.84E-07	5.20E-03	4.65E-07	1.16E-04	8.10E-04	2.95E-03	1.35E-06	2.08E-03	2.04E-05
E and W Harry Bridges, Figueroa to start Alameda	5.59E-04	2.06E-06	1.96E-06	5.26E-03	1.47E-06	1.07E-04	9.31E-07	9.25E-03	4.90E-07	2.06E-04	8.53E-04	5.24E-03	1.42E-06	3.71E-03	2.15E-05
Alameda beginning (E Harry Bridges) to Anaheim	3.94E-04	1.48E-06	1.41E-06	3.70E-03	1.06E-06	7.52E-05	6.69E-07	6.51E-03	3.52E-07	1.45E-04	6.13E-04	3.69E-03	1.02E-06	2.61E-03	1.54E-05
Alameda Anaheim to Henry Ford	1.48E-04	5.68E-07	5.41E-07	1.39E-03	4.06E-07	2.82E-05	2.57E-07	2.44E-03	1.35E-07	5.45E-05	2.35E-04	1.38E-03	3.92E-07	9.78E-04	5.92E-06
Alameda Henry Ford to PCH	3.64E-04	1.34E-06	1.28E-06	3.42E-03	9.58E-07	6.95E-05	6.06E-07	6.01E-03	3.19E-07	1.34E-04	5.55E-04	3.41E-03	9.26E-07	2.41E-03	1.40E-05
Alameda PCH to 405	2.23E-03	1.17E-05	1.11E-05	2.09E-02	8.32E-06	4.25E-04	5.27E-06	3.68E-02	2.77E-06	8.22E-04	4.83E-03	2.09E-02	8.05E-06	1.48E-02	1.22E-04
Alameda 405 to del Amo	1.13E-03	7.43E-06	7.08E-06	1.06E-02	5.31E-06	2.16E-04	3.36E-06	1.87E-02	1.77E-06	4.17E-04	3.08E-03	1.06E-02	5.13E-06	7.48E-03	7.75E-05
Alameda, del Amo to South Santa Fe Avenue	3.96E-04	2.62E-06	2.50E-06	3.72E-03	1.87E-06	7.56E-05	1.19E-06	6.54E-03	6.25E-07	1.46E-04	1.09E-03	3.71E-03	1.81E-06	2.62E-03	2.74E-05
Alameda, South Santa Fe Avenue to SR-91	4.05E-04	2.69E-06	2.57E-06	3.81E-03	1.92E-06	7.74E-05	1.22E-06	6.70E-03	6.42E-07	1.50E-04	1.12E-03	3.80E-03	1.86E-06	2.69E-03	2.81E-05
I-110, "C" Street Interchange to Anaheim	4.94E-04	3.90E-06	3.71E-06	4.65E-03	2.78E-06	9.44E-05	1.76E-06	8.17E-03	9.28E-07	1.82E-04	1.61E-03	4.63E-03	2.69E-06	3.28E-03	4.07E-05
I-110, Anaheim to PCH	8.28E-04	6.57E-06	6.25E-06	7.79E-03	4.69E-06	1.58E-04	2.97E-06	1.37E-02	1.56E-06	3.06E-04	2.72E-03	7.77E-03	4.53E-06	5.49E-03	6.85E-05
1-110, PCH to Sepulveda	1.50E-03	1.20E-05	1.14E-05	1.41E-02	8.58E-06	2.86E-04	5.43E-06	2.48E-02	2.86E-06	5.53E-04	4.97E-03	1.41E-02	8.29E-06	9.93E-03	1.25E-04
I-110, Sepulveda to Carson	1.69E-03	1.38E-05	1.31E-05	1.59E-02	9.84E-06	3.24E-04	6.24E-06	2.80E-02	3.28E-06	6.26E-04	5.71E-03	1.59E-02	9.52E-06	1.12E-02	1.44E-04
I-110, Carson to Del Amo	1.12E-03	9.21E-06	8.77E-06	1.05E-02	6.58E-06	2.14E-04	4.17E-06	1.85E-02	2.19E-06	4.14E-04	3.82E-03	1.05E-02	6.36E-06	7.43E-03	9.60E-05
I-110, Del Amo to 405	8.43E-04	7.01E-06	6.67E-06	7.93E-03	5.01E-06	1.61E-04	3.17E-06	1.39E-02	1.67E-06	3.11E-04	2.90E-03	7.90E-03	4.84E-06	5.59E-03	7.31E-05
I-110, 405 to SR-91	1.36E-03	1.17E-05	1.11E-05	1.28E-02	8.36E-06	2.59E-04	5.30E-06	2.24E-02	2.79E-06	5.01E-04	4.85E-03	1.27E-02	8.08E-06	8.99E-03	1.22E-04
I-710, Anaheim to PCH	1.07E-03	6.68E-06	6.36E-06	1.00E-02	4.77E-06	2.04E-04	3.02E-06	1.77E-02	1.59E-06	3.94E-04	2.77E-03	1.00E-02	4.61E-06	7.08E-03	6.96E-05
I-710, PCH to Willow	2.32E-03	1.46E-05	1.39E-05	2.18E-02	1.04E-05	4.44E-04	6.58E-06	3.84E-02	3.47E-06	8.58E-04	6.03E-03	2.18E-02	1.00E-05	1.54E-02	1.52E-04
I-710, Willow to 405	3.51E-03	2.20E-05	2.10E-05	3.30E-02	1.57E-05	6.71E-04	9.96E-06	5.81E-02	5.24E-06	1.30E-03	9.13E-03	3.29E-02	1.52E-05	2.33E-02	2.30E-04
I-710, 405 to Del Amo	3.17E-03	2.03E-05	1.94E-05	2.99E-02	1.45E-05	6.06E-04	9.19E-06	5.25E-02	4.84E-06	1.17E-03	8.42E-03	2.98E-02	1.40E-05	2.10E-02	2.12E-04
I-710, Del Amo to Long Beach Blvd Interchange	2.60E-03	1.67E-05	1.59E-05	2.44E-02	1.19E-05	4.96E-04	7.55E-06	4.29E-02	3.98E-06	9.59E-04	6.92E-03	2.43E-02	1.15E-05	1.72E-02	1.74E-04
I-710, Long Beach Boulevard to SR-91	2.26E-03	1.48E-05	1.41E-05	2.12E-02	1.06E-05	4.31E-04	6.70E-06	3.73E-02	3.53E-06	8.34E-04	6.14E-03	2.12E-02	1.02E-05	1.50E-02	1.54E-04
PCH, I110 to Alameda	8.27E-04	3.31E-06	3.15E-06	7.78E-03	2.36E-06	1.58E-04	1.50E-06	1.37E-02	7.87E-07	3.05E-04	1.37E-03	7.76E-03	2.28E-06	5.48E-03	3.45E-05
PCH, Alameda to SR-103	2.24E-04	8.49E-07	8.09E-07	2.11E-03	6.07E-07	4.28E-05	3.84E-07	3.70E-03	2.02E-07	8.27E-05	3.52E-04	2.10E-03	5.87E-07	1.48E-03	8.86E-06
PCH, SR-103 to I-710	7.15E-04	2.43E-06	2.31E-06	6.73E-03	1.73E-06	1.37E-04	1.10E-06	1.18E-02	5.78E-07	2.64E-04	1.01E-03	6.71E-03	1.68E-06	4.74E-03	2.53E-05
Sepulveda, I-110 to Avalon	1.66E-04	7.72E-07	7.35E-07	1.56E-03	5.51E-07	3.18E-05	3.49E-07	2.75E-03	1.84E-07	6.14E-05	3.20E-04	1.56E-03	5.33E-07	1.10E-03	8.05E-06
Sepulveda, Avalon to Alameda	2.89E-04	1.30E-06	1.23E-06	2.72E-03	9.26E-07	5.52E-05	5.86E-07	4.78E-03	3.09E-07	1.07E-04	5.37E-04	2.71E-03	8.95E-07	1.92E-03	1.35E-05
Sepulveda, Alameda to ICTF	1.86E-04	7.09E-07	6.75E-07	1.75E-03	5.06E-07	3.55E-05	3.21E-07	3.08E-03	1.69E-07	6.87E-05	2.94E-04	1.75E-03	4.90E-07	1.23E-03	7.39E-06
Sepulveda, ICTF to SR-103	7.81E-05	2.90E-07	2.76E-07	7.35E-04	2.07E-07	1.49E-05	1.31E-07	1.29E-03	6.90E-08	2.89E-05	1.20E-04	7.33E-04	2.00E-07	5.18E-04	3.02E-06
Del Amo, I-110 to Wilmington	2.74E-04	1.31E-06	1.25E-06	2.58E-03	9.36E-07	5.23E-05	5.93E-07	4.53E-03	3.12E-07	1.01E-04	5.43E-04	2.57E-03	9.05E-07	1.82E-03	1.37E-05
Del Amo, Wilminton to Alameda	2.05E-04	9.57E-07	9.11E-07	1.93E-03	6.83E-07	3.93E-05	4.33E-07	3.40E-03	2.28E-07	7.59E-05	3.96E-04	1.93E-03	6.61E-07	1.36E-03	9.98E-06
Del Amo, Alameda to I-710	2.20E-04	1.05E-06	9.97E-07	2.07E-03	7.48E-07	4.20E-05	4.74E-07	3.64E-03	2.49E-07	8.13E-05	4.34E-04	2.06E-03	7.23E-07	1.46E-03	1.09E-05
223rd Street, I-110 to Avalon	1.10E-04	5.60E-07	5.33E-07	1.03E-03	4.00E-07	2.09E-05	2.53E-07	1.81E-03	1.33E-07	4.05E-05	2.32E-04	1.03E-03	3.87E-07	7.26E-04	5.84E-06
223rd Street, Avalon to Wilmington	9.14E-05	4.72E-07	4.49E-07	8.60E-04	3.37E-07	1.75E-05	2.13E-07	1.51E-03	1.12E-07	3.38E-05	1.95E-04	8.58E-04	3.26E-07	6.06E-04	4.92E-06
223rd Street, Wilmington to Alameda	1.88E-04	8.82E-07	8.40E-07	1.77E-03	6.30E-07	3.60E-05	3.99E-07	3.12E-03	2.10E-07	6.96E-05	3.65E-04	1.77E-03	6.09E-07	1.25E-03	9.20E-06
W Wardlow from Alameda to I-710	1.56E-04	7.67E-07	7.30E-07	1.46E-03	5.48E-07	2.97E-05	3.47E-07	2.58E-03	1.83E-07	5.75E-05	3.18E-04	1.46E-03	5.29E-07	1.03E-03	7.99E-06

Table B-7
2015 No Build
Maximum Hourly Truck Emissions

	Port Trucks - - LNG Exhaust								Port Trucks - - LNG Exhaust								
	TOG	Acetaldehyde	Benzene	Formaldehyde	n-Hexane	Propylene	Toluene	Xylenes	PM10	Bromine	Chlorine	Chromium (hex)	Copper	Manganese	Nickel	Sulfates	Zinc
		75070	71432	50000	110543	115071	108883	1330207		7726956	7782505	18540299	7440508	7439965	7440020	9960	7440666
Baseline 2015	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	0.71	2.13E-04	7.79E-04	5.74E-03	1.42E-04	1.20E-02	2.83E-04	1.42E-04	1.10E-01	1.74E-09	2.44E-07	8.70E-11	1.74E-09	1.74E-09	1.74E-09	1.57E-06	1.74E-09
Henry Ford Ramps	0.07	2.00E-05	7.35E-05	5.41E-04	1.34E-05	1.13E-03	2.67E-05	1.34E-05	1.04E-02	1.56E-10	2.19E-08	7.81E-12	1.56E-10	1.56E-10	1.56E-10	1.41E-07	1.56E-10
Henry Ford n/o Ramps to Alameda	0.31	9.39E-05	3.44E-04	2.54E-03	6.26E-05	5.29E-03	1.25E-04	6.26E-05	4.86E-02	7.32E-10	1.03E-07	3.66E-11	7.32E-10	7.32E-10	7.32E-10	6.59E-07	7.32E-10
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	0.48	1.45E-04	5.31E-04	3.91E-03	9.65E-05	8.15E-03	1.93E-04	9.65E-05	7.50E-02	1.19E-09	1.67E-07	5.96E-11	1.19E-09	1.19E-09	1.19E-09	1.07E-06	1.19E-09
SR-103 Anaheim to PCH	0.29	8.75E-05	3.21E-04	2.36E-03	5.83E-05	4.93E-03	1.17E-04	5.83E-05	4.53E-02	7.32E-10	1.03E-07	3.66E-11	7.32E-10	7.32E-10	7.32E-10	6.59E-07	7.32E-10
SR-103 PCH to Sepulveda/Willow	0.26	7.68E-05	2.82E-04	2.07E-03	5.12E-05	4.33E-03	1.02E-04	5.12E-05	3.98E-02	6.75E-10	9.44E-08	3.37E-11	6.75E-10	6.75E-10	6.75E-10	6.07E-07	6.75E-10
E and W Harry Bridges, Figueroa to start Alameda	0.31	9.43E-05	3.46E-04	2.54E-03	6.28E-05	5.31E-03	1.26E-04	6.28E-05	4.88E-02	7.11E-10	9.95E-08	3.55E-11	7.11E-10	7.11E-10	7.11E-10	6.40E-07	7.11E-10
Alameda beginning (E Harry Bridges) to Anaheim	0.21	6.31E-05	2.31E-04	1.70E-03	4.21E-05	3.56E-03	8.42E-05	4.21E-05	3.27E-02	5.11E-10	7.15E-08	2.55E-11	5.11E-10	5.11E-10	5.11E-10	4.60E-07	5.11E-10
Alameda Anaheim to Henry Ford	0.07	2.22E-05	8.14E-05	6.00E-04	1.48E-05	1.25E-03	2.96E-05	1.48E-05	1.15E-02	1.96E-10	2.75E-08	9.80E-12	1.96E-10	1.96E-10	1.96E-10	1.76E-07	1.96E-10
Alameda Henry Ford to PCH	0.20	6.11E-05	2.24E-04	1.65E-03	4.08E-05	3.44E-03	8.15E-05	4.08E-05	3.17E-02	4.63E-10	6.48E-08	2.31E-11	4.63E-10	4.63E-10	4.63E-10	4.17E-07	4.63E-10
Alameda PCH to 405	1.47	4.40E-04	1.61E-03	1.19E-02	2.93E-04	2.48E-02	5.87E-04	2.93E-04	2.28E-01	4.02E-09	5.63E-07	2.01E-10	4.02E-09	4.02E-09	4.02E-09	3.62E-06	4.02E-09
Alameda 405 to del Amo	0.76	2.28E-04	8.37E-04	6.16E-03	1.52E-04	1.29E-02	3.04E-04	1.52E-04	1.18E-01	2.56E-09	3.59E-07	1.28E-10	2.56E-09	2.56E-09	2.56E-09	2.31E-06	2.56E-09
Alameda, del Amo to South Santa Fe Avenue	0.26	7.80E-05	2.86E-04	2.11E-03	5.20E-05	4.39E-03	1.04E-04	5.20E-05	4.04E-02	9.06E-10	1.27E-07	4.53E-11	9.06E-10	9.06E-10	9.06E-10	8.15E-07	9.06E-10
Alameda, South Santa Fe Avenue to SR-91	0.26	7.89E-05	2.89E-04	2.13E-03	5.26E-05	4.44E-03	1.05E-04	5.26E-05	4.09E-02	9.30E-10	1.30E-07	4.65E-11	9.30E-10	9.30E-10	9.30E-10	8.37E-07	9.30E-10
I-110, "C" Street Interchange to Anaheim	0.40	1.19E-04	4.36E-04	3.21E-03	7.92E-05	6.69E-03	1.58E-04	7.92E-05	6.15E-02	1.35E-09	1.88E-07	6.73E-11	1.35E-09	1.35E-09	1.35E-09	1.21E-06	1.35E-09
I-110, Anaheim to PCH	0.65	1.95E-04	7.14E-04	5.26E-03	1.30E-04	1.10E-02	2.60E-04	1.30E-04	1.01E-01	2.27E-09	3.17E-07	1.13E-10	2.27E-09	2.27E-09	2.27E-09	2.04E-06	2.27E-09
1-110, PCH to Sepulveda	1.12	3.36E-04	1.23E-03	9.07E-03	2.24E-04	1.89E-02	4.48E-04	2.24E-04	1.74E-01	4.14E-09	5.80E-07	2.07E-10	4.14E-09	4.14E-09	4.14E-09	3.73E-06	4.14E-09
I-110, Sepulveda to Carson	1.17	3.52E-04	1.29E-03	9.50E-03	2.35E-04	1.98E-02	4.69E-04	2.35E-04	1.82E-01	4.76E-09	6.66E-07	2.38E-10	4.76E-09	4.76E-09	4.76E-09	4.28E-06	4.76E-09
I-110, Carson to Del Amo	0.73	2.20E-04	8.07E-04	5.94E-03	1.47E-04	1.24E-02	2.93E-04	1.47E-04	1.14E-01	3.18E-09	4.45E-07	1.59E-10	3.18E-09	3.18E-09	3.18E-09	2.86E-06	3.18E-09
I-110, Del Amo to 405	0.52	1.55E-04	5.67E-04	4.18E-03	1.03E-04	8.72E-03	2.06E-04	1.03E-04	8.02E-02	2.42E-09	3.39E-07	1.21E-10	2.42E-09	2.42E-09	2.42E-09	2.18E-06	2.42E-09
I-110, 405 to SR-91	0.64	1.92E-04	7.05E-04	5.19E-03	1.28E-04	1.08E-02	2.56E-04	1.28E-04	9.96E-02	4.04E-09	5.66E-07	2.02E-10	4.04E-09	4.04E-09	4.04E-09	3.64E-06	4.04E-09
I-710, Anaheim to PCH	0.86	2.57E-04	9.41E-04	6.93E-03	1.71E-04	1.45E-02	3.42E-04	1.71E-04	1.33E-01	2.30E-09	3.23E-07	1.15E-10	2.30E-09	2.30E-09	2.30E-09	2.07E-06	2.30E-09
I-710, PCH to Willow	1.85	5.54E-04	2.03E-03	1.49E-02	3.69E-04	3.12E-02	7.38E-04	3.69E-04	2.87E-01	5.02E-09	7.03E-07	2.51E-10	5.02E-09	5.02E-09	5.02E-09	4.52E-06	5.02E-09
I-710, Willow to 405	2.78	8.35E-04	3.06E-03	2.25E-02	5.56E-04	4.70E-02	1.11E-03	5.56E-04	4.32E-01	7.60E-09	1.06E-06	3.80E-10	7.60E-09	7.60E-09	7.60E-09	6.84E-06	7.60E-09
I-710, 405 to Del Amo	2.36	7.09E-04	2.60E-03	1.91E-02	4.72E-04	3.99E-02	9.45E-04	4.72E-04	3.67E-01	7.02E-09	9.82E-07	3.51E-10	7.02E-09	7.02E-09	7.02E-09	6.31E-06	7.02E-09
I-710, Del Amo to Long Beach Blvd Interchange	1.90	5.70E-04	2.09E-03	1.54E-02	3.80E-04	3.21E-02	7.60E-04	3.80E-04	2.95E-01	5.77E-09	8.07E-07	2.88E-10	5.77E-09	5.77E-09	5.77E-09	5.19E-06	5.77E-09
I-710, Long Beach Boulevard to SR-91	1.54	4.63E-04	1.70E-03	1.25E-02	3.09E-04	2.61E-02	6.17E-04	3.09E-04	2.40E-01	5.11E-09	7.16E-07	2.56E-10	5.11E-09	5.11E-09	5.11E-09	4.60E-06	5.11E-09
PCH, I110 to Alameda	0.21	6.39E-05	2.34E-04	1.73E-03	4.26E-05	3.60E-03	8.52E-05	4.26E-05	3.31E-02	1.14E-09	1.60E-07	5.71E-11	1.14E-09	1.14E-09	1.14E-09	1.03E-06	1.14E-09
PCH, Alameda to SR-103	0.07	2.22E-05	8.14E-05	6.00E-04	1.48E-05	1.25E-03	2.96E-05	1.48E-05	1.15E-02	2.93E-10	4.11E-08	1.47E-11	2.93E-10	2.93E-10	2.93E-10	2.64E-07	2.93E-10
PCH, SR-103 to I-710	0.34	1.01E-04	3.72E-04	2.74E-03	6.76E-05	5.71E-03	1.35E-04	6.76E-05	5.25E-02	8.38E-10	1.17E-07	4.19E-11	8.38E-10	8.38E-10	8.38E-10	7.55E-07	8.38E-10
Sepulveda, I-110 to Avalon	0.04	1.07E-05	3.92E-05	2.89E-04	7.13E-06	6.02E-04	1.43E-05	7.13E-06	5.54E-03	2.66E-10	3.73E-08	1.33E-11	2.66E-10	2.66E-10	2.66E-10	2.40E-07	2.66E-10
Sepulveda, Avalon to Alameda	0.08	2.36E-05	8.66E-05	6.38E-04	1.57E-05	1.33E-03	3.15E-05	1.57E-05	1.22E-02	4.48E-10	6.27E-08	2.24E-11	4.48E-10	4.48E-10	4.48E-10	4.03E-07	4.48E-10
Sepulveda, Alameda to ICTF	0.10	2.88E-05	1.05E-04	7.77E-04	1.92E-05	1.62E-03	3.83E-05	1.92E-05	1.49E-02	2.45E-10	3.43E-08	1.22E-11	2.45E-10	2.45E-10	2.45E-10	2.20E-07	2.45E-10
Sepulveda, ICTF to SR-103	0.04	1.29E-05	4.74E-05	3.49E-04	8.62E-06	7.28E-04	1.72E-05	8.62E-06	6.70E-03	1.00E-10	1.40E-08	5.01E-12	1.00E-10	1.00E-10	1.00E-10	9.01E-08	1.00E-10
Del Amo, I-110 to Wilmington	0.04	1.34E-05	4.91E-05	3.62E-04	8.94E-06	7.55E-04	1.79E-05	8.94E-06	6.94E-03	4.52E-10	6.33E-08	2.26E-11	4.52E-10	4.52E-10	4.52E-10	4.07E-07	4.52E-10
Del Amo, Wilminton to Alameda	0.04	1.29E-05	4.74E-05	3.49E-04	8.61E-06	7.28E-04	1.72E-05	8.61E-06	6.69E-03	3.30E-10	4.62E-08	1.65E-11	3.30E-10	3.30E-10	3.30E-10	2.97E-07	3.30E-10
Del Amo, Alameda to I-710	0.04	1.14E-05	4.20E-05	3.09E-04	7.63E-06	6.45E-04	1.53E-05	7.63E-06	5.93E-03	3.61E-10	5.06E-08	1.81E-11	3.61E-10	3.61E-10	3.61E-10	3.25E-07	3.61E-10
223rd Street, I-110 to Avalon	0.00	1.49E-06	5.46E-06	4.02E-05	9.94E-07	8.40E-05	1.99E-06	9.94E-07	7.72E-04	1.93E-10	2.71E-08	9.66E-12	1.93E-10	1.93E-10	1.93E-10	1.74E-07	1.93E-10
223rd Street, Avalon to Wilmington	0.00	7.66E-07	2.81E-06	2.07E-05	5.10E-07	4.31E-05	1.02E-06	5.10E-07	3.97E-04	1.63E-10	2.28E-08	8.14E-12	1.63E-10	1.63E-10	1.63E-10	1.47E-07	1.63E-10
223rd Street, Wilmington to Alameda	0.04	1.13E-05	4.16E-05	3.06E-04	7.56E-06	6.39E-04	1.51E-05	7.56E-06	5.87E-03	3.05E-10	4.26E-08	1.52E-11	3.05E-10	3.05E-10	3.05E-10	2.74E-07	3.05E-10
W Wardlow from Alameda to I-710	0.02	5.28E-06	1.94E-05	1.43E-04	3.52E-06	2.97E-04	7.04E-06	3.52E-06	2.73E-03	2.65E-10	3.71E-08	1.32E-11	2.65E-10	2.65E-10	2.65E-10	2.38E-07	2.65E-10

Table B-7
2015 No Build
Maximum Hourly Truck Emissions

	Port Trucks - Diesel Exhaust (LNG & Diesel Trucks)												
	TOG	1,3-Butadiene	Acetaldehyde	Benzene	Ethylbenzene	formaldehyde	n-Hexane	Methanol	MEK	Propylene	Sthrene	Toluene	Xylene
		106990	75070	71432	100414	50000	110543	67561	78933	115071	100425	108883	1330207
Baseline 2015	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	5.23E-01	9.94E-04	3.85E-02	1.05E-02	1.60E-03	7.70E-02	8.22E-04	1.57E-04	7.73E-03	1.36E-02	3.04E-04	7.71E-03	5.45E-03
Henry Ford Ramps	1.37E-01	2.60E-04	1.01E-02	2.74E-03	4.18E-04	2.02E-02	2.15E-04	4.11E-05	2.02E-03	3.56E-03	7.95E-05	2.02E-03	1.43E-03
Henry Ford n/o Ramps to Alameda	6.42E-01	1.22E-03	4.72E-02	1.29E-02	1.96E-03	9.45E-02	1.01E-03	1.93E-04	9.49E-03	1.67E-02	3.73E-04	9.46E-03	6.69E-03
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	3.56E-01	6.77E-04	2.62E-02	7.13E-03	1.09E-03	5.24E-02	5.60E-04	1.07E-04	5.26E-03	9.25E-03	2.07E-04	5.25E-03	3.71E-03
SR-103 Anaheim to PCH	2.15E-01	4.09E-04	1.58E-02	4.31E-03	6.57E-04	3.17E-02	3.38E-04	6.46E-05	3.18E-03	5.60E-03	1.25E-04	3.17E-03	2.24E-03
SR-103 PCH to Sepulveda/Willow	1.89E-01	3.59E-04	1.39E-02	3.79E-03	5.77E-04	2.78E-02	2.97E-04	5.67E-05	2.79E-03	4.91E-03	1.10E-04	2.79E-03	1.97E-03
E and W Harry Bridges, Figueroa to start Alameda	3.39E-01	6.44E-04	2.49E-02	6.78E-03	1.03E-03	4.99E-02	5.32E-04	1.02E-04	5.01E-03	8.80E-03	1.97E-04	4.99E-03	3.53E-03
Alameda beginning (E Harry Bridges) to Anaheim	2.27E-01	4.31E-04	1.67E-02	4.54E-03	6.93E-04	3.34E-02	3.56E-04	6.81E-05	3.35E-03	5.90E-03	1.32E-04	3.34E-03	2.36E-03
Alameda Anaheim to Henry Ford	7.99E-02	1.52E-04	5.87E-03	1.60E-03	2.44E-04	1.18E-02	1.25E-04	2.40E-05	1.18E-03	2.07E-03	4.63E-05	1.18E-03	8.31E-04
Alameda Henry Ford to PCH	2.20E-01	4.18E-04	1.62E-02	4.40E-03	6.71E-04	3.24E-02	3.45E-04	6.60E-05	3.25E-03	5.71E-03	1.28E-04	3.24E-03	2.29E-03
Alameda PCH to 405	1.23E+00	2.33E-03	9.01E-02	2.45E-02	3.74E-03	1.80E-01	1.92E-03	3.68E-04	1.81E-02	3.18E-02	7.11E-04	1.80E-02	1.28E-02
Alameda 405 to del Amo	5.62E-01	1.07E-03	4.13E-02	1.12E-02	1.71E-03	8.27E-02	8.82E-04	1.69E-04	8.30E-03	1.46E-02	3.26E-04	8.28E-03	5.85E-03
Alameda, del Amo to South Santa Fe Avenue	1.92E-01	3.65E-04	1.41E-02	3.84E-03	5.86E-04	2.83E-02	3.01E-04	5.76E-05	2.84E-03	4.99E-03	1.11E-04	2.83E-03	2.00E-03
Alameda, South Santa Fe Avenue to SR-91	1.94E-01	3.69E-04	1.43E-02	3.89E-03	5.92E-04	2.86E-02	3.05E-04	5.83E-05	2.87E-03	5.04E-03	1.13E-04	2.86E-03	2.02E-03
I-110, "C" Street Interchange to Anaheim	2.62E-01	4.98E-04	1.93E-02	5.25E-03	8.00E-04	3.86E-02	4.12E-04	7.87E-05	3.87E-03	6.81E-03	1.52E-04	3.86E-03	2.73E-03
I-110, Anaheim to PCH	4.30E-01	8.17E-04	3.16E-02	8.61E-03	1.31E-03	6.33E-02	6.75E-04	1.29E-04	6.35E-03	1.12E-02	2.49E-04	6.34E-03	4.48E-03
1-110, PCH to Sepulveda	7.41E-01	1.41E-03	5.45E-02	1.48E-02	2.26E-03	1.09E-01	1.16E-03	2.22E-04	1.10E-02	1.93E-02	4.30E-04	1.09E-02	7.72E-03
I-110, Sepulveda to Carson	7.77E-01	1.48E-03	5.71E-02	1.56E-02	2.37E-03	1.14E-01	1.22E-03	2.33E-04	1.15E-02	2.02E-02	4.51E-04	1.14E-02	8.09E-03
I-110, Carson to Del Amo	4.86E-01	9.23E-04	3.57E-02	9.72E-03	1.48E-03	7.15E-02	7.63E-04	1.46E-04	7.18E-03	1.26E-02	2.82E-04	7.16E-03	5.06E-03
I-110, Del Amo to 405	3.42E-01	6.49E-04	2.51E-02	6.84E-03	1.04E-03	5.03E-02	5.36E-04	1.02E-04	5.05E-03	8.87E-03	1.98E-04	5.03E-03	3.56E-03
I-110, 405 to SR-91	4.24E-01	8.06E-04	3.12E-02	8.49E-03	1.29E-03	6.24E-02	6.66E-04	1.27E-04	6.27E-03	1.10E-02	2.46E-04	6.25E-03	4.42E-03
I-710, Anaheim to PCH	6.32E-01	1.20E-03	4.64E-02	1.26E-02	1.93E-03	9.29E-02	9.92E-04	1.90E-04	9.33E-03	1.64E-02	3.66E-04	9.30E-03	6.58E-03
I-710, PCH to Willow	1.36E+00	2.59E-03	1.00E-01	2.73E-02	4.16E-03	2.01E-01	2.14E-03	4.09E-04	2.01E-02	3.54E-02	7.90E-04	2.01E-02	1.42E-02
I-710, Willow to 405	2.05E+00	3.90E-03	1.51E-01	4.11E-02	6.27E-03	3.02E-01	3.23E-03	6.16E-04	3.03E-02	5.34E-02	1.19E-03	3.03E-02	2.14E-02
I-710, 405 to Del Amo	1.74E+00	3.31E-03	1.28E-01	3.49E-02	5.32E-03	2.57E-01	2.74E-03	5.23E-04	2.58E-02	4.53E-02	1.01E-03	2.57E-02	1.82E-02
I-710, Del Amo to Long Beach Blvd Interchange	1.40E+00	2.67E-03	1.03E-01	2.81E-02	4.28E-03	2.07E-01	2.20E-03	4.21E-04	2.07E-02	3.65E-02	8.14E-04	2.07E-02	1.46E-02
I-710, Long Beach Boulevard to SR-91	1.14E+00	2.16E-03	8.38E-02	2.28E-02	3.47E-03	1.68E-01	1.79E-03	3.42E-04	1.68E-02	2.96E-02	6.61E-04	1.68E-02	1.19E-02
PCH, I110 to Alameda	2.62E-01	4.97E-04	1.93E-02	5.24E-03	7.99E-04	3.85E-02	4.11E-04	7.85E-05	3.87E-03	6.80E-03	1.52E-04	3.86E-03	2.73E-03
PCH, Alameda to SR-103	9.10E-02	1.73E-04	6.69E-03	1.82E-03	2.77E-04	1.34E-02	1.43E-04	2.73E-05	1.34E-03	2.36E-03	5.28E-05	1.34E-03	9.47E-04
PCH, SR-103 to I-710	4.15E-01	7.89E-04	3.05E-02	8.31E-03	1.27E-03	6.11E-02	6.52E-04	1.25E-04	6.13E-03	1.08E-02	2.41E-04	6.12E-03	4.32E-03
Sepulveda, I-110 to Avalon	3.85E-02	7.31E-05	2.83E-03	7.70E-04	1.17E-04	5.66E-03	6.04E-05	1.15E-05	5.68E-04	9.99E-04	2.23E-05	5.66E-04	4.00E-04
Sepulveda, Avalon to Alameda	8.49E-02	1.61E-04	6.25E-03	1.70E-03	2.59E-04	1.25E-02	1.33E-04	2.55E-05	1.25E-03	2.21E-03	4.93E-05	1.25E-03	8.84E-04
Sepulveda, Alameda to ICTF	1.03E-01	1.97E-04	7.61E-03	2.07E-03	3.15E-04	1.52E-02	1.62E-04	3.10E-05	1.53E-03	2.69E-03	6.00E-05	1.52E-03	1.08E-03
Sepulveda, ICTF to SR-103	4.65E-02	8.84E-05	3.42E-03	9.31E-04	1.42E-04	6.84E-03	7.30E-05	1.40E-05	6.87E-04	1.21E-03	2.70E-05	6.85E-04	4.84E-04
Del Amo, I-110 to Wilmington	4.82E-02	9.16E-05	3.54E-03	9.65E-04	1.47E-04	7.09E-03	7.57E-05	1.45E-05	7.12E-04	1.25E-03	2.80E-05	7.10E-04	5.02E-04
Del Amo, Wilminton to Alameda	4.64E-02	8.83E-05	3.42E-03	9.29E-04	1.42E-04	6.83E-03	7.29E-05	1.39E-05	6.86E-04	1.21E-03	2.69E-05	6.84E-04	4.84E-04
Del Amo, Alameda to I-710	4.12E-02	7.82E-05	3.03E-03	8.24E-04	1.26E-04	6.06E-03	6.46E-05	1.23E-05	6.08E-04	1.07E-03	2.39E-05	6.06E-04	4.28E-04
223rd Street, I-110 to Avalon	5.36E-03	1.02E-05	3.94E-04	1.07E-04	1.63E-05	7.89E-04	8.42E-06	1.61E-06	7.92E-05	1.39E-04	3.11E-06	7.90E-05	5.58E-05
223rd Street, Avalon to Wilmington	2.75E-03	5.23E-06	2.02E-04	5.51E-05	8.40E-06	4.05E-04	4.32E-06	8.26E-07	4.07E-05	7.15E-05	1.60E-06	4.06E-05	2.87E-05
223rd Street, Wilmington to Alameda	4.08E-02	7.75E-05	3.00E-03	8.16E-04	1.24E-04	6.00E-03	6.40E-05	1.22E-05	6.02E-04	1.06E-03	2.37E-05	6.01E-04	4.25E-04
W Wardlow from Alameda to I-710	1.90E-02	3.61E-05	1.40E-03	3.80E-04	5.79E-05	2.79E-03	2.98E-05	5.70E-06	2.80E-04	4.93E-04	1.10E-05	2.80E-04	1.98E-04

Table B-7
2015 No Build
Maximum Hourly Truck Emissions

	Port Trucks - Diesel Exhaust (LNG & Diesel Trucks)																	
	DPM	Ammonia	Antimony	Arsenic	Bromine	Bromine	Cadmium	Chlorine	Chromium	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Sulfates	Vanadium	Zinc
		7664417	7440360	7440382	7726956	7726956	7440439	7782505	18540299	7440508	7439921	7439965	7439976	7440020	7782492	9960	7440622	7440666
Baseline 2015	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	1.19E-01	4.02E-04	4.29E-06	5.96E-07	2.15E-06	2.15E-06	4.77E-06	4.10E-05	7.15E-08	2.98E-06	5.01E-06	4.77E-06	3.58E-06	2.26E-06	1.19E-06	2.07E-03	3.46E-06	5.22E-05
Henry Ford Ramps	1.08E-02	3.63E-05	3.88E-07	5.39E-08	1.94E-07	1.94E-07	4.31E-07	3.71E-06	6.47E-09	2.69E-07	4.53E-07	4.31E-07	3.23E-07	2.05E-07	1.08E-07	1.88E-04	3.13E-07	4.72E-06
Henry Ford n/o Ramps to Alameda	5.05E-02	1.70E-04	1.82E-06	2.53E-07	9.09E-07	9.09E-07	2.02E-06	1.74E-05	3.03E-08	1.26E-06	2.12E-06	2.02E-06	1.52E-06	9.60E-07	5.05E-07	8.79E-04	1.46E-06	2.21E-05
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	8.12E-02	2.73E-04	2.92E-06	4.06E-07	1.46E-06	1.46E-06	3.25E-06	2.79E-05	4.87E-08	2.03E-06	3.41E-06	3.25E-06	2.44E-06	1.54E-06	8.12E-07	1.41E-03	2.35E-06	3.56E-05
SR-103 Anaheim to PCH	4.91E-02	1.65E-04	1.77E-06	2.45E-07	8.83E-07	8.83E-07	1.96E-06	1.69E-05	2.94E-08	1.23E-06	2.06E-06	1.96E-06	1.47E-06	9.33E-07	4.91E-07	8.54E-04	1.42E-06	2.15E-05
SR-103 PCH to Sepulveda/Willow	4.31E-02	1.45E-04	1.55E-06	2.15E-07	7.76E-07	7.76E-07	1.72E-06	1.48E-05	2.59E-08	1.08E-06	1.81E-06	1.72E-06	1.29E-06	8.19E-07	4.31E-07	7.50E-04	1.25E-06	1.89E-05
E and W Harry Bridges, Figueroa to start Alameda	4.57E-02	1.54E-04	1.64E-06	2.28E-07	8.22E-07	8.22E-07	1.83E-06	1.57E-05	2.74E-08	1.14E-06	1.92E-06	1.83E-06	1.37E-06	8.68E-07	4.57E-07	7.95E-04	1.32E-06	2.00E-05
Alameda beginning (E Harry Bridges) to Anaheim	3.06E-02	1.03E-04	1.10E-06	1.53E-07	5.51E-07	5.51E-07	1.22E-06	1.05E-05	1.84E-08	7.65E-07	1.28E-06	1.22E-06	9.18E-07	5.81E-07	3.06E-07	5.32E-04	8.87E-07	1.34E-05
Alameda Anaheim to Henry Ford	1.08E-02	3.63E-05	3.87E-07	5.38E-08	1.94E-07	1.94E-07	4.30E-07	3.70E-06	6.46E-09	2.69E-07	4.52E-07	4.30E-07	3.23E-07	2.04E-07	1.08E-07	1.87E-04	3.12E-07	4.71E-06
Alameda Henry Ford to PCH	2.96E-02	9.98E-05	1.07E-06	1.48E-07	5.33E-07	5.33E-07	1.18E-06	1.02E-05	1.78E-08	7.41E-07	1.24E-06	1.18E-06	8.89E-07	5.63E-07	2.96E-07	5.15E-04	8.59E-07	1.30E-05
Alameda PCH to 405	2.27E-01	7.64E-04	8.16E-06	1.13E-06	4.08E-06	4.08E-06	9.07E-06	7.80E-05	1.36E-07	5.67E-06	9.52E-06	9.07E-06	6.80E-06	4.31E-06	2.27E-06	3.94E-03	6.57E-06	9.93E-05
Alameda 405 to del Amo	1.28E-01	4.31E-04	4.61E-06	6.40E-07	2.30E-06	2.30E-06	5.12E-06	4.40E-05	7.68E-08	3.20E-06	5.38E-06	5.12E-06	3.84E-06	2.43E-06	1.28E-06	2.23E-03	3.71E-06	5.61E-05
Alameda, del Amo to South Santa Fe Avenue	4.37E-02	1.47E-04	1.57E-06	2.19E-07	7.87E-07	7.87E-07	1.75E-06	1.50E-05	2.62E-08	1.09E-06	1.84E-06	1.75E-06	1.31E-06	8.31E-07	4.37E-07	7.61E-04	1.27E-06	1.92E-05
Alameda, South Santa Fe Avenue to SR-91	4.42E-02	1.49E-04	1.59E-06	2.21E-07	7.96E-07	7.96E-07	1.77E-06	1.52E-05	2.65E-08	1.11E-06	1.86E-06	1.77E-06	1.33E-06	8.41E-07	4.42E-07	7.70E-04	1.28E-06	1.94E-05
I-110, "C" Street Interchange to Anaheim	7.39E-02	2.49E-04	2.66E-06	3.69E-07	1.33E-06	1.33E-06	2.95E-06	2.54E-05	4.43E-08	1.85E-06	3.10E-06	2.95E-06	2.22E-06	1.40E-06	7.39E-07	1.29E-03	2.14E-06	3.23E-05
I-110, Anaheim to PCH	1.21E-01	4.08E-04	4.36E-06	6.06E-07	2.18E-06	2.18E-06	4.85E-06	4.17E-05	7.27E-08	3.03E-06	5.09E-06	4.85E-06	3.63E-06	2.30E-06	1.21E-06	2.11E-03	3.51E-06	5.31E-05
1-110, PCH to Sepulveda	2.09E-01	7.03E-04	7.52E-06	1.04E-06	3.76E-06	3.76E-06	8.35E-06	7.18E-05	1.25E-07	5.22E-06	8.77E-06	8.35E-06	6.26E-06	3.97E-06	2.09E-06	3.63E-03	6.06E-06	9.15E-05
I-110, Sepulveda to Carson	2.19E-01	7.37E-04	7.88E-06	1.09E-06	3.94E-06	3.94E-06	8.75E-06	7.53E-05	1.31E-07	5.47E-06	9.19E-06	8.75E-06	6.57E-06	4.16E-06	2.19E-06	3.81E-03	6.35E-06	9.59E-05
I-110, Carson to Del Amo	1.37E-01	4.61E-04	4.93E-06	6.84E-07	2.46E-06	2.46E-06	5.47E-06	4.71E-05	8.21E-08	3.42E-06	5.75E-06	5.47E-06	4.10E-06	2.60E-06	1.37E-06	2.38E-03	3.97E-06	5.99E-05
I-110, Del Amo to 405	9.62E-02	3.24E-04	3.46E-06	4.81E-07	1.73E-06	1.73E-06	3.85E-06	3.31E-05	5.77E-08	2.41E-06	4.04E-06	3.85E-06	2.89E-06	1.83E-06	9.62E-07	1.67E-03	2.79E-06	4.21E-05
I-110, 405 to SR-91	1.20E-01	4.03E-04	4.30E-06	5.98E-07	2.15E-06	2.15E-06	4.78E-06	4.11E-05	7.17E-08	2.99E-06	5.02E-06	4.78E-06	3.59E-06	2.27E-06	1.20E-06	2.08E-03	3.47E-06	5.23E-05
I-710, Anaheim to PCH	1.44E-01	4.85E-04	5.18E-06	7.19E-07	2.59E-06	2.59E-06	5.76E-06	4.95E-05	8.63E-08	3.60E-06	6.04E-06	5.76E-06	4.32E-06	2.73E-06	1.44E-06	2.50E-03	4.17E-06	6.30E-05
I-710, PCH to Willow	3.10E-01	1.05E-03	1.12E-05	1.55E-06	5.59E-06	5.59E-06	1.24E-05	1.07E-04	1.86E-07	7.76E-06	1.30E-05	1.24E-05	9.31E-06	5.90E-06	3.10E-06	5.40E-03	9.00E-06	1.36E-04
I-710, Willow to 405	4.68E-01	1.58E-03	1.68E-05	2.34E-06	8.42E-06	8.42E-06	1.87E-05	1.61E-04	2.81E-07	1.17E-05	1.97E-05	1.87E-05	1.40E-05	8.89E-06	4.68E-06	8.14E-03	1.36E-05	2.05E-04
I-710, 405 to Del Amo	3.97E-01	1.34E-03	1.43E-05	1.99E-06	7.15E-06	7.15E-06	1.59E-05	1.37E-04	2.38E-07	9.93E-06	1.67E-05	1.59E-05	1.19E-05	7.55E-06	3.97E-06	6.91E-03	1.15E-05	1.74E-04
I-710, Del Amo to Long Beach Blvd Interchange	3.20E-01	1.08E-03	1.15E-05	1.60E-06	5.76E-06	5.76E-06	1.28E-05	1.10E-04	1.92E-07	7.99E-06	1.34E-05	1.28E-05	9.59E-06	6.07E-06	3.20E-06	5.56E-03	9.27E-06	1.40E-04
I-710, Long Beach Boulevard to SR-91	2.60E-01	8.74E-04	9.34E-06	1.30E-06	4.67E-06	4.67E-06	1.04E-05	8.93E-05	1.56E-07	6.49E-06	1.09E-05	1.04E-05	7.79E-06	4.93E-06	2.60E-06	4.52E-03	7.53E-06	1.14E-04
PCH, I110 to Alameda	3.19E-02	1.08E-04	1.15E-06	1.60E-07	5.75E-07	5.75E-07	1.28E-06	1.10E-05	1.92E-08	7.99E-07	1.34E-06	1.28E-06	9.58E-07	6.07E-07	3.19E-07	5.56E-04	9.26E-07	1.40E-05
PCH, Alameda to SR-103	1.11E-02	3.74E-05	4.00E-07	5.55E-08	2.00E-07	2.00E-07	4.44E-07	3.82E-06	6.66E-09	2.77E-07	4.66E-07	4.44E-07	3.33E-07	2.11E-07	1.11E-07	1.93E-04	3.22E-07	4.86E-06
PCH, SR-103 to I-710	5.07E-02	1.71E-04	1.82E-06	2.53E-07	9.12E-07	9.12E-07	2.03E-06	1.74E-05	3.04E-08	1.27E-06	2.13E-06	2.03E-06	1.52E-06	9.62E-07	5.07E-07	8.81E-04	1.47E-06	2.22E-05
Sepulveda, I-110 to Avalon	5.18E-03	1.75E-05	1.87E-07	2.59E-08	9.33E-08	9.33E-08	2.07E-07	1.78E-06	3.11E-09	1.30E-07	2.18E-07	2.07E-07	1.55E-07	9.84E-08	5.18E-08	9.02E-05	1.50E-07	2.27E-06
Sepulveda, Avalon to Alameda	1.14E-02	3.86E-05	4.12E-07	5.72E-08	2.06E-07	2.06E-07	4.58E-07	3.94E-06	6.87E-09	2.86E-07	4.81E-07	4.58E-07	3.43E-07	2.17E-07	1.14E-07	1.99E-04	3.32E-07	5.01E-06
Sepulveda, Alameda to ICTF	1.39E-02	4.69E-05	5.02E-07	6.97E-08	2.51E-07	2.51E-07	5.57E-07	4.79E-06	8.36E-09	3.48E-07	5.85E-07	5.57E-07	4.18E-07	2.65E-07	1.39E-07	2.42E-04	4.04E-07	6.10E-06
Sepulveda, ICTF to SR-103	6.27E-03	2.11E-05	2.26E-07	3.13E-08	1.13E-07	1.13E-07	2.51E-07	2.16E-06	3.76E-09	1.57E-07	2.63E-07	2.51E-07	1.88E-07	1.19E-07	6.27E-08	1.09E-04	1.82E-07	2.74E-06
Del Amo, I-110 to Wilmington	6.49E-03	2.19E-05	2.34E-07	3.25E-08	1.17E-07	1.17E-07	2.60E-07	2.23E-06	3.90E-09	1.62E-07	2.73E-07	2.60E-07	1.95E-07	1.23E-07	6.49E-08	1.13E-04	1.88E-07	2.84E-06
Del Amo, Wilminton to Alameda	6.26E-03	2.11E-05	2.25E-07	3.13E-08	1.13E-07	1.13E-07	2.50E-07	2.15E-06	3.75E-09	1.56E-07	2.63E-07	2.50E-07	1.88E-07	1.19E-07	6.26E-08	1.09E-04	1.81E-07	2.74E-06
Del Amo, Alameda to I-710	5.54E-03	1.87E-05	2.00E-07	2.77E-08	9.98E-08	9.98E-08	2.22E-07	1.91E-06	3.33E-09	1.39E-07	2.33E-07	2.22E-07	1.66E-07	1.05E-07	5.54E-08	9.65E-05	1.61E-07	2.43E-06
223rd Street, I-110 to Avalon	7.22E-04	2.43E-06	2.60E-08	3.61E-09	1.30E-08	1.30E-08	2.89E-08	2.48E-07	4.33E-10	1.81E-08	3.03E-08	2.89E-08	2.17E-08	1.37E-08	7.22E-09	1.26E-05	2.09E-08	3.16E-07
223rd Street, Avalon to Wilmington	3.71E-04	1.25E-06	1.34E-08	1.86E-09	6.68E-09	6.68E-09	1.48E-08	1.28E-07	2.23E-10	9.28E-09	1.56E-08	1.48E-08	1.11E-08	7.05E-09	3.71E-09	6.46E-06	1.08E-08	1.63E-07
223rd Street, Wilmington to Alameda	5.49E-03	1.85E-05	1.98E-07	2.75E-08	9.89E-08	9.89E-08	2.20E-07	1.89E-06	3.30E-09	1.37E-07	2.31E-07	2.20E-07	1.65E-07	1.04E-07	5.49E-08	9.56E-05	1.59E-07	2.41E-06
W Wardlow from Alameda to I-710	2.56E-03	8.62E-06	9.21E-08	1.28E-08	4.60E-08	4.60E-08	1.02E-07	8.80E-07	1.53E-09	6.39E-08	1.07E-07	1.02E-07	7.67E-08	4.86E-08	2.56E-08	4.45E-05	7.42E-08	1.12E-06

Table B-7
2015 No Build
Maximum Hourly Truck Emissions

	SCAG Gasoline Truck Emissions					
	TOG	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
		71432	50000	106990	75070	107028
Baseline 2015	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	1.65E-03	4.01E-05	2.81E-05	9.10E-06	6.34E-06	2.16E-06
Henry Ford Ramps	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Henry Ford n/o Ramps to Alameda	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	2.09E-03	5.09E-05	3.58E-05	1.16E-05	8.05E-06	2.74E-06
SR-103 Anaheim to PCH	2.81E-03	6.85E-05	4.81E-05	1.56E-05	1.08E-05	3.69E-06
SR-103 PCH to Sepulveda/Willow	6.74E-03	1.64E-04	1.15E-04	3.73E-05	2.60E-05	8.84E-06
E and W Harry Bridges, Figueroa to start Alameda	1.21E-02	2.94E-04	2.07E-04	6.68E-05	4.65E-05	1.58E-05
Alameda beginning (E Harry Bridges) to Anaheim	1.68E-02	4.10E-04	2.88E-04	9.31E-05	6.48E-05	2.20E-05
Alameda Anaheim to Henry Ford	1.00E-02	2.44E-04	1.71E-04	5.53E-05	3.85E-05	1.31E-05
Alameda Henry Ford to PCH	8.31E-03	2.02E-04	1.42E-04	4.60E-05	3.20E-05	1.09E-05
Alameda PCH to 405	1.22E-01	2.96E-03	2.08E-03	6.73E-04	4.69E-04	1.60E-04
Alameda 405 to del Amo	9.58E-02	2.33E-03	1.64E-03	5.30E-04	3.69E-04	1.26E-04
Alameda, del Amo to South Santa Fe Avenue	3.67E-02	8.94E-04	6.28E-04	2.03E-04	1.41E-04	4.81E-05
Alameda, South Santa Fe Avenue to SR-91	3.90E-02	9.50E-04	6.68E-04	2.16E-04	1.50E-04	5.11E-05
I-110, "C" Street Interchange to Anaheim	3.06E-02	7.45E-04	5.23E-04	1.69E-04	1.18E-04	4.01E-05
I-110, Anaheim to PCH	5.69E-02	1.38E-03	9.72E-04	3.14E-04	2.19E-04	7.45E-05
1-110, PCH to Sepulveda	1.24E-01	3.03E-03	2.13E-03	6.87E-04	4.79E-04	1.63E-04
I-110, Sepulveda to Carson	1.76E-01	4.30E-03	3.02E-03	9.76E-04	6.79E-04	2.31E-04
I-110, Carson to Del Amo	1.33E-01	3.24E-03	2.27E-03	7.36E-04	5.12E-04	1.74E-04
I-110, Del Amo to 405	1.14E-01	2.78E-03	1.95E-03	6.30E-04	4.39E-04	1.49E-04
I-110, 405 to SR-91	2.57E-01	6.26E-03	4.39E-03	1.42E-03	9.89E-04	3.37E-04
I-710, Anaheim to PCH	2.95E-02	7.19E-04	5.05E-04	1.63E-04	1.14E-04	3.87E-05
I-710, PCH to Willow	7.08E-02	1.72E-03	1.21E-03	3.91E-04	2.72E-04	9.27E-05
I-710, Willow to 405	1.11E-01	2.69E-03	1.89E-03	6.12E-04	4.26E-04	1.45E-04
I-710, 405 to Del Amo	1.70E-01	4.13E-03	2.90E-03	9.38E-04	6.53E-04	2.22E-04
I-710, Del Amo to Long Beach Blvd Interchange	1.53E-01	3.72E-03	2.61E-03	8.44E-04	5.88E-04	2.00E-04
I-710, Long Beach Boulevard to SR-91	1.83E-01	4.45E-03	3.12E-03	1.01E-03	7.03E-04	2.39E-04
PCH, I110 to Alameda	2.09E-01	5.08E-03	3.57E-03	1.15E-03	8.04E-04	2.74E-04
PCH, Alameda to SR-103	4.07E-02	9.92E-04	6.96E-04	2.25E-04	1.57E-04	5.34E-05
PCH, SR-103 to I-710	3.20E-02	7.79E-04	5.47E-04	1.77E-04	1.23E-04	4.19E-05
Sepulveda, I-110 to Avalon	4.78E-02	1.16E-03	8.17E-04	2.64E-04	1.84E-04	6.26E-05
Sepulveda, Avalon to Alameda	7.03E-02	1.71E-03	1.20E-03	3.89E-04	2.71E-04	9.21E-05
Sepulveda, Alameda to ICTF	1.07E-02	2.60E-04	1.82E-04	5.90E-05	4.11E-05	1.40E-05
Sepulveda, ICTF to SR-103	2.31E-03	5.63E-05	3.95E-05	1.28E-05	8.90E-06	3.03E-06
Del Amo, I-110 to Wilmington	8.95E-02	2.18E-03	1.53E-03	4.95E-04	3.44E-04	1.17E-04
Del Amo, Wilminton to Alameda	5.98E-02	1.46E-03	1.02E-03	3.31E-04	2.30E-04	7.84E-05
Del Amo, Alameda to I-710	7.02E-02	1.71E-03	1.20E-03	3.88E-04	2.70E-04	9.19E-05
223rd Street, I-110 to Avalon	4.56E-02	1.11E-03	7.81E-04	2.52E-04	1.76E-04	5.98E-05
223rd Street, Avalon to Wilmington	3.93E-02	9.58E-04	6.73E-04	2.17E-04	1.51E-04	5.15E-05
223rd Street, Wilmington to Alameda	5.62E-02	1.37E-03	9.60E-04	3.11E-04	2.16E-04	7.36E-05
W Wardlow from Alameda to I-710	5.68E-02	1.38E-03	9.72E-04	3.14E-04	2.19E-04	7.44E-05

Table B-7
2015 No Build
Maximum Hourly Truck Emissions

	SCAG Diesel Truck Exhaust												
	TOG	1,3-Butadiene	Acetaldehyde	Benzene	Ethylbenzene	formaldehyde	n-Hexane	Methanol	MEK	Propylene	Sthrene	Toluene	Xylene
		106990	75070	71432	100414	50000	110543	67561	78933	115071	100425	108883	1330207
Baseline 2015	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	2.69E-03	5.11E-06	1.98E-04	5.38E-05	8.20E-06	3.96E-04	4.22E-06	8.07E-07	3.97E-05	6.98E-05	1.56E-06	3.96E-05	2.80E-05
Henry Ford Ramps	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Henry Ford n/o Ramps to Alameda	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	3.42E-03	6.49E-06	2.51E-04	6.84E-05	1.04E-05	5.03E-04	5.36E-06	1.03E-06	5.05E-05	8.87E-05	1.98E-06	5.03E-05	3.56E-05
SR-103 Anaheim to PCH	4.60E-03	8.73E-06	3.38E-04	9.20E-05	1.40E-05	6.76E-04	7.22E-06	1.38E-06	6.79E-05	1.19E-04	2.67E-06	6.77E-05	4.78E-05
SR-103 PCH to Sepulveda/Willow	1.10E-02	2.09E-05	8.10E-04	2.20E-04	3.36E-05	1.62E-03	1.73E-05	3.31E-06	1.63E-04	2.86E-04	6.39E-06	1.62E-04	1.15E-04
E and W Harry Bridges, Figueroa to start Alameda	1.71E-02	3.24E-05	1.25E-03	3.41E-04	5.20E-05	2.51E-03	2.68E-05	5.12E-06	2.52E-04	4.43E-04	9.89E-06	2.51E-04	1.77E-04
Alameda beginning (E Harry Bridges) to Anaheim	2.37E-02	4.51E-05	1.75E-03	4.75E-04	7.24E-05	3.49E-03	3.73E-05	7.12E-06	3.51E-04	6.17E-04	1.38E-05	3.50E-04	2.47E-04
Alameda Anaheim to Henry Ford	1.41E-02	2.68E-05	1.04E-03	2.83E-04	4.31E-05	2.08E-03	2.22E-05	4.24E-06	2.09E-04	3.67E-04	8.19E-06	2.08E-04	1.47E-04
Alameda Henry Ford to PCH	1.17E-02	2.23E-05	8.62E-04	2.35E-04	3.58E-05	1.73E-03	1.84E-05	3.52E-06	1.73E-04	3.04E-04	6.80E-06	1.73E-04	1.22E-04
Alameda PCH to 405	1.93E-01	3.66E-04	1.42E-02	3.86E-03	5.88E-04	2.84E-02	3.03E-04	5.78E-05	2.85E-03	5.00E-03	1.12E-04	2.84E-03	2.01E-03
Alameda 405 to del Amo	1.57E-01	2.97E-04	1.15E-02	3.13E-03	4.77E-04	2.30E-02	2.46E-04	4.70E-05	2.31E-03	4.07E-03	9.08E-05	2.31E-03	1.63E-03
Alameda, del Amo to South Santa Fe Avenue	6.00E-02	1.14E-04	4.41E-03	1.20E-03	1.83E-04	8.82E-03	9.41E-05	1.80E-05	8.86E-04	1.56E-03	3.48E-05	8.83E-04	6.24E-04
Alameda, South Santa Fe Avenue to SR-91	6.38E-02	1.21E-04	4.69E-03	1.28E-03	1.94E-04	9.38E-03	1.00E-04	1.91E-05	9.42E-04	1.66E-03	3.70E-05	9.39E-04	6.64E-04
I-110, "C" Street Interchange to Anaheim	5.24E-02	9.95E-05	3.85E-03	1.05E-03	1.60E-04	7.70E-03	8.22E-05	1.57E-05	7.73E-04	1.36E-03	3.04E-05	7.71E-04	5.45E-04
I-110, Anaheim to PCH	9.73E-02	1.85E-04	7.15E-03	1.95E-03	2.97E-04	1.43E-02	1.53E-04	2.92E-05	1.44E-03	2.53E-03	5.64E-05	1.43E-03	1.01E-03
1-110, PCH to Sepulveda	2.13E-01	4.04E-04	1.56E-02	4.26E-03	6.49E-04	3.13E-02	3.34E-04	6.38E-05	3.14E-03	5.52E-03	1.23E-04	3.13E-03	2.21E-03
I-110, Sepulveda to Carson	3.02E-01	5.73E-04	2.22E-02	6.04E-03	9.20E-04	4.44E-02	4.74E-04	9.05E-05	4.46E-03	7.84E-03	1.75E-04	4.45E-03	3.14E-03
I-110, Carson to Del Amo	2.28E-01	4.32E-04	1.67E-02	4.55E-03	6.94E-04	3.35E-02	3.57E-04	6.83E-05	3.36E-03	5.91E-03	1.32E-04	3.35E-03	2.37E-03
I-110, Del Amo to 405	1.95E-01	3.70E-04	1.43E-02	3.90E-03	5.95E-04	2.87E-02	3.06E-04	5.85E-05	2.88E-03	5.06E-03	1.13E-04	2.87E-03	2.03E-03
I-110, 405 to SR-91	4.40E-01	8.35E-04	3.23E-02	8.80E-03	1.34E-03	6.47E-02	6.90E-04	1.32E-04	6.49E-03	1.14E-02	2.55E-04	6.48E-03	4.58E-03
I-710, Anaheim to PCH	4.82E-02	9.16E-05	3.55E-03	9.65E-04	1.47E-04	7.10E-03	7.57E-05	1.45E-05	7.12E-04	1.25E-03	2.80E-05	7.10E-04	5.02E-04
I-710, PCH to Willow	1.16E-01	2.20E-04	8.50E-03	2.31E-03	3.53E-04	1.70E-02	1.82E-04	3.47E-05	1.71E-03	3.00E-03	6.71E-05	1.70E-03	1.20E-03
I-710, Willow to 405	1.81E-01	3.43E-04	1.33E-02	3.61E-03	5.51E-04	2.66E-02	2.84E-04	5.42E-05	2.67E-03	4.69E-03	1.05E-04	2.66E-03	1.88E-03
I-710, 405 to Del Amo	2.77E-01	5.26E-04	2.04E-02	5.54E-03	8.45E-04	4.08E-02	4.35E-04	8.31E-05	4.09E-03	7.19E-03	1.61E-04	4.08E-03	2.88E-03
I-710, Del Amo to Long Beach Blvd Interchange	2.49E-01	4.74E-04	1.83E-02	4.99E-03	7.60E-04	3.67E-02	3.91E-04	7.48E-05	3.68E-03	6.47E-03	1.45E-04	3.67E-03	2.60E-03
I-710, Long Beach Boulevard to SR-91	2.98E-01	5.67E-04	2.19E-02	5.97E-03	9.10E-04	4.39E-02	4.68E-04	8.95E-05	4.41E-03	7.75E-03	1.73E-04	4.40E-03	3.11E-03
PCH, I110 to Alameda	2.65E-01	5.03E-04	1.95E-02	5.30E-03	8.08E-04	3.90E-02	4.16E-04	7.94E-05	3.91E-03	6.88E-03	1.54E-04	3.90E-03	2.76E-03
PCH, Alameda to SR-103	5.16E-02	9.81E-05	3.80E-03	1.03E-03	1.58E-04	7.60E-03	8.11E-05	1.55E-05	7.63E-04	1.34E-03	3.00E-05	7.61E-04	5.38E-04
PCH, SR-103 to I-710	4.06E-02	7.71E-05	2.98E-03	8.12E-04	1.24E-04	5.97E-03	6.37E-05	1.22E-05	5.99E-04	1.05E-03	2.35E-05	5.98E-04	4.22E-04
Sepulveda, I-110 to Avalon	6.74E-02	1.28E-04	4.95E-03	1.35E-03	2.06E-04	9.91E-03	1.06E-04	2.02E-05	9.95E-04	1.75E-03	3.91E-05	9.92E-04	7.01E-04
Sepulveda, Avalon to Alameda	9.92E-02	1.89E-04	7.30E-03	1.99E-03	3.03E-04	1.46E-02	1.56E-04	2.98E-05	1.47E-03	2.58E-03	5.75E-05	1.46E-03	1.03E-03
Sepulveda, Alameda to ICTF	1.50E-02	2.86E-05	1.11E-03	3.01E-04	4.59E-05	2.21E-03	2.36E-05	4.51E-06	2.22E-04	3.91E-04	8.73E-06	2.22E-04	1.57E-04
Sepulveda, ICTF to SR-103	3.26E-03	6.20E-06	2.40E-04	6.53E-05	9.95E-06	4.80E-04	5.12E-06	9.78E-07	4.82E-05	8.47E-05	1.89E-06	4.80E-05	3.40E-05
Del Amo, I-110 to Wilmington	1.26E-01	2.40E-04	9.28E-03	2.53E-03	3.85E-04	1.86E-02	1.98E-04	3.79E-05	1.86E-03	3.28E-03	7.32E-05	1.86E-03	1.31E-03
Del Amo, Wilminton to Alameda	8.44E-02	1.60E-04	6.21E-03	1.69E-03	2.57E-04	1.24E-02	1.33E-04	2.53E-05	1.25E-03	2.19E-03	4.89E-05	1.24E-03	8.79E-04
Del Amo, Alameda to I-710	9.90E-02	1.88E-04	7.28E-03	1.98E-03	3.02E-04	1.46E-02	1.55E-04	2.97E-05	1.46E-03	2.57E-03	5.74E-05	1.46E-03	1.03E-03
223rd Street, I-110 to Avalon	6.44E-02	1.22E-04	4.74E-03	1.29E-03	1.96E-04	9.48E-03	1.01E-04	1.93E-05	9.51E-04	1.67E-03	3.74E-05	9.49E-04	6.70E-04
223rd Street, Avalon to Wilmington	5.55E-02	1.05E-04	4.08E-03	1.11E-03	1.69E-04	8.16E-03	8.71E-05	1.66E-05	8.20E-04	1.44E-03	3.22E-05	8.17E-04	5.78E-04
223rd Street, Wilmington to Alameda	7.92E-02	1.51E-04	5.83E-03	1.59E-03	2.42E-04	1.17E-02	1.24E-04	2.38E-05	1.17E-03	2.06E-03	4.59E-05	1.17E-03	8.25E-04
W Wardlow from Alameda to I-710	8.02E-02	1.52E-04	5.90E-03	1.60E-03	2.45E-04	1.18E-02	1.26E-04	2.41E-05	1.18E-03	2.08E-03	4.65E-05	1.18E-03	8.35E-04

Table B-7
2015 No Build
Maximum Hourly Truck Emissions

	SCAG Diesel Truck Exhaust Emissions																	
	DPM	Ammonia	Antimony	Arsenic	Bromine	Bromine	Cadmium	Chlorine	Chromium (hex)	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Sulfates	Vanadium	Zinc
		7664417	7440360	7440382	7726956	7726956	7440439	7782505	18540299	7440508	7439921	7439965	7439976	7440020	7782492	9960	7440622	7440666
Baseline 2015	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	8.40E-04	2.83E-06	3.02E-08	4.20E-09	1.51E-08	1.51E-08	3.36E-08	2.89E-07	5.04E-10	2.10E-08	3.53E-08	3.36E-08	2.52E-08	1.60E-08	8.40E-09	1.46E-05	2.43E-08	3.68E-07
Henry Ford Ramps	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Henry Ford n/o Ramps to Alameda	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.07E-03	3.59E-06	3.84E-08	5.34E-09	1.92E-08	1.92E-08	4.27E-08	3.67E-07	6.40E-10	2.67E-08	4.48E-08	4.27E-08	3.20E-08	2.03E-08	1.07E-08	1.86E-05	3.09E-08	4.67E-07
SR-103 Anaheim to PCH	1.44E-03	4.83E-06	5.17E-08	7.18E-09	2.58E-08	2.58E-08	5.74E-08	4.94E-07	8.61E-10	3.59E-08	6.03E-08	5.74E-08	4.31E-08	2.73E-08	1.44E-08	2.50E-05	4.16E-08	6.29E-07
SR-103 PCH to Sepulveda/Willow	3.44E-03	1.16E-05	1.24E-07	1.72E-08	6.19E-08	6.19E-08	1.38E-07	1.18E-06	2.06E-09	8.60E-08	1.44E-07	1.38E-07	1.03E-07	6.54E-08	3.44E-08	5.99E-05	9.98E-08	1.51E-06
E and W Harry Bridges, Figueroa to start Alameda	3.34E-03	1.12E-05	1.20E-07	1.67E-08	6.01E-08	6.01E-08	1.33E-07	1.15E-06	2.00E-09	8.34E-08	1.40E-07	1.33E-07	1.00E-07	6.34E-08	3.34E-08	5.81E-05	9.68E-08	1.46E-06
Alameda beginning (E Harry Bridges) to Anaheim	4.65E-03	1.57E-05	1.67E-07	2.32E-08	8.36E-08	8.36E-08	1.86E-07	1.60E-06	2.79E-09	1.16E-07	1.95E-07	1.86E-07	1.39E-07	8.83E-08	4.65E-08	8.09E-05	1.35E-07	2.04E-06
Alameda Anaheim to Henry Ford	2.76E-03	9.31E-06	9.95E-08	1.38E-08	4.97E-08	4.97E-08	1.11E-07	9.51E-07	1.66E-09	6.91E-08	1.16E-07	1.11E-07	8.29E-08	5.25E-08	2.76E-08	4.81E-05	8.01E-08	1.21E-06
Alameda Henry Ford to PCH	2.29E-03	7.73E-06	8.26E-08	1.15E-08	4.13E-08	4.13E-08	9.18E-08	7.89E-07	1.38E-09	5.74E-08	9.64E-08	9.18E-08	6.88E-08	4.36E-08	2.29E-08	3.99E-05	6.66E-08	1.01E-06
Alameda PCH to 405	5.08E-02	1.71E-04	1.83E-06	2.54E-07	9.15E-07	9.15E-07	2.03E-06	1.75E-05	3.05E-08	1.27E-06	2.13E-06	2.03E-06	1.52E-06	9.66E-07	5.08E-07	8.84E-04	1.47E-06	2.23E-05
Alameda 405 to del Amo	4.89E-02	1.65E-04	1.76E-06	2.44E-07	8.80E-07	8.80E-07	1.96E-06	1.68E-05	2.93E-08	1.22E-06	2.05E-06	1.96E-06	1.47E-06	9.29E-07	4.89E-07	8.51E-04	1.42E-06	2.14E-05
Alameda, del Amo to South Santa Fe Avenue	1.87E-02	6.31E-05	6.74E-07	9.36E-08	3.37E-07	3.37E-07	7.49E-07	6.44E-06	1.12E-08	4.68E-07	7.86E-07	7.49E-07	5.62E-07	3.56E-07	1.87E-07	3.26E-04	5.43E-07	8.20E-06
Alameda, South Santa Fe Avenue to SR-91	1.99E-02	6.71E-05	7.17E-07	9.96E-08	3.58E-07	3.58E-07	7.96E-07	6.85E-06	1.19E-08	4.98E-07	8.36E-07	7.96E-07	5.97E-07	3.78E-07	1.99E-07	3.46E-04	5.77E-07	8.72E-06
I-110, "C" Street Interchange to Anaheim	1.90E-02	6.39E-05	6.83E-07	9.48E-08	3.41E-07	3.41E-07	7.58E-07	6.52E-06	1.14E-08	4.74E-07	7.96E-07	7.58E-07	5.69E-07	3.60E-07	1.90E-07	3.30E-04	5.50E-07	8.31E-06
I-110, Anaheim to PCH	3.52E-02	1.19E-04	1.27E-06	1.76E-07	6.34E-07	6.34E-07	1.41E-06	1.21E-05	2.11E-08	8.81E-07	1.48E-06	1.41E-06	1.06E-06	6.69E-07	3.52E-07	6.13E-04	1.02E-06	1.54E-05
1-110, PCH to Sepulveda	7.70E-02	2.60E-04	2.77E-06	3.85E-07	1.39E-06	1.39E-06	3.08E-06	2.65E-05	4.62E-08	1.93E-06	3.24E-06	3.08E-06	2.31E-06	1.46E-06	7.70E-07	1.34E-03	2.23E-06	3.37E-05
I-110, Sepulveda to Carson	1.09E-01	3.68E-04	3.94E-06	5.47E-07	1.97E-06	1.97E-06	4.37E-06	3.76E-05	6.56E-08	2.73E-06	4.59E-06	4.37E-06	3.28E-06	2.08E-06	1.09E-06	1.90E-03	3.17E-06	4.79E-05
I-110, Carson to Del Amo	8.24E-02	2.78E-04	2.97E-06	4.12E-07	1.48E-06	1.48E-06	3.30E-06	2.84E-05	4.95E-08	2.06E-06	3.46E-06	3.30E-06	2.47E-06	1.57E-06	8.24E-07	1.43E-03	2.39E-06	3.61E-05
I-110, Del Amo to 405	7.06E-02	2.38E-04	2.54E-06	3.53E-07	1.27E-06	1.27E-06	2.82E-06	2.43E-05	4.24E-08	1.77E-06	2.97E-06	2.82E-06	2.12E-06	1.34E-06	7.06E-07	1.23E-03	2.05E-06	3.09E-05
I-110, 405 to SR-91	1.59E-01	5.36E-04	5.73E-06	7.96E-07	2.87E-06	2.87E-06	6.37E-06	5.48E-05	9.55E-08	3.98E-06	6.69E-06	6.37E-06	4.78E-06	3.03E-06	1.59E-06	2.77E-03	4.62E-06	6.97E-05
I-710, Anaheim to PCH	1.51E-02	5.07E-05	5.42E-07	7.53E-08	2.71E-07	2.71E-07	6.02E-07	5.18E-06	9.04E-09	3.77E-07	6.33E-07	6.02E-07	4.52E-07	2.86E-07	1.51E-07	2.62E-04	4.37E-07	6.60E-06
I-710, PCH to Willow	3.61E-02	1.22E-04	1.30E-06	1.81E-07	6.50E-07	6.50E-07	1.44E-06	1.24E-05	2.17E-08	9.03E-07	1.52E-06	1.44E-06	1.08E-06	6.86E-07	3.61E-07	6.28E-04	1.05E-06	1.58E-05
I-710, Willow to 405	5.64E-02	1.90E-04	2.03E-06	2.82E-07	1.02E-06	1.02E-06	2.26E-06	1.94E-05	3.38E-08	1.41E-06	2.37E-06	2.26E-06	1.69E-06	1.07E-06	5.64E-07	9.82E-04	1.64E-06	2.47E-05
I-710, 405 to Del Amo	8.65E-02	2.91E-04	3.11E-06	4.32E-07	1.56E-06	1.56E-06	3.46E-06	2.98E-05	5.19E-08	2.16E-06	3.63E-06	3.46E-06	2.59E-06	1.64E-06	8.65E-07	1.51E-03	2.51E-06	3.79E-05
I-710, Del Amo to Long Beach Blvd Interchange	7.79E-02	2.62E-04	2.80E-06	3.89E-07	1.40E-06	1.40E-06	3.11E-06	2.68E-05	4.67E-08	1.95E-06	3.27E-06	3.11E-06	2.34E-06	1.48E-06	7.79E-07	1.35E-03	2.26E-06	3.41E-05
I-710, Long Beach Boulevard to SR-91	9.32E-02	3.14E-04	3.35E-06	4.66E-07	1.68E-06	1.68E-06	3.73E-06	3.21E-05	5.59E-08	2.33E-06	3.91E-06	3.73E-06	2.80E-06	1.77E-06	9.32E-07	1.62E-03	2.70E-06	4.08E-05
PCH, I110 to Alameda	4.68E-02	1.58E-04	1.68E-06	2.34E-07	8.42E-07	8.42E-07	1.87E-06	1.61E-05	2.81E-08	1.17E-06	1.96E-06	1.87E-06	1.40E-06	8.89E-07	4.68E-07	8.14E-04	1.36E-06	2.05E-05
PCH, Alameda to SR-103	9.13E-03	3.07E-05	3.29E-07	4.56E-08	1.64E-07	1.64E-07	3.65E-07	3.14E-06	5.48E-09	2.28E-07	3.83E-07	3.65E-07	2.74E-07	1.73E-07	9.13E-08	1.59E-04	2.65E-07	4.00E-06
PCH, SR-103 to I-710	7.17E-03	2.42E-05	2.58E-07	3.58E-08	1.29E-07	1.29E-07	2.87E-07	2.47E-06	4.30E-09	1.79E-07	3.01E-07	2.87E-07	2.15E-07	1.36E-07	7.17E-08	1.25E-04	2.08E-07	3.14E-06
Sepulveda, I-110 to Avalon	1.32E-02	4.44E-05	4.75E-07	6.59E-08	2.37E-07	2.37E-07	5.28E-07	4.54E-06	7.91E-09	3.30E-07	5.54E-07	5.28E-07	3.96E-07	2.51E-07	1.32E-07	2.29E-04	3.82E-07	5.78E-06
Sepulveda, Avalon to Alameda	1.94E-02	6.54E-05	6.99E-07	9.71E-08	3.50E-07	3.50E-07	7.77E-07	6.68E-06	1.17E-08	4.86E-07	8.16E-07	7.77E-07	5.83E-07	3.69E-07	1.94E-07	3.38E-04	5.63E-07	8.51E-06
Sepulveda, Alameda to ICTF	2.95E-03	9.92E-06	1.06E-07	1.47E-08	5.30E-08	5.30E-08	1.18E-07	1.01E-06	1.77E-09	7.36E-08	1.24E-07	1.18E-07	8.84E-08	5.60E-08	2.95E-08	5.12E-05	8.54E-08	1.29E-06
Sepulveda, ICTF to SR-103	6.38E-04	2.15E-06	2.30E-08	3.19E-09	1.15E-08	1.15E-08	2.55E-08	2.20E-07	3.83E-10	1.60E-08	2.68E-08	2.55E-08	1.92E-08	1.21E-08	6.38E-09	1.11E-05	1.85E-08	2.80E-07
Del Amo, I-110 to Wilmington	2.47E-02	8.32E-05	8.89E-07	1.24E-07	4.45E-07	4.45E-07	9.88E-07	8.50E-06	1.48E-08	6.18E-07	1.04E-06	9.88E-07	7.41E-07	4.69E-07	2.47E-07	4.30E-04	7.16E-07	1.08E-05
Del Amo, Wilminton to Alameda	1.65E-02	5.57E-05	5.95E-07	8.26E-08	2.97E-07	2.97E-07	6.61E-07	5.68E-06	9.91E-09	4.13E-07	6.94E-07	6.61E-07	4.96E-07	3.14E-07	1.65E-07	2.87E-04	4.79E-07	7.24E-06
Del Amo, Alameda to I-710	1.94E-02	6.53E-05	6.98E-07	9.69E-08	3.49E-07	3.49E-07	7.75E-07	6.67E-06	1.16E-08	4.84E-07	8.14E-07	7.75E-07	5.81E-07	3.68E-07	1.94E-07	3.37E-04	5.62E-07	8.49E-06
223rd Street, I-110 to Avalon	1.26E-02	4.25E-05	4.54E-07	6.30E-08	2.27E-07	2.27E-07	5.04E-07	4.34E-06	7.56E-09	3.15E-07	5.29E-07	5.04E-07	3.78E-07	2.40E-07	1.26E-07	2.19E-04	3.66E-07	5.52E-06
223rd Street, Avalon to Wilmington	1.09E-02	3.66E-05	3.91E-07	5.43E-08	1.95E-07	1.95E-07	4.34E-07	3.74E-06	6.52E-09	2.72E-07	4.56E-07	4.34E-07	3.26E-07	2.06E-07	1.09E-07	1.89E-04	3.15E-07	4.76E-06
223rd Street, Wilmington to Alameda	1.55E-02	5.22E-05	5.58E-07	7.75E-08	2.79E-07	2.79E-07	6.20E-07	5.33E-06	9.30E-09	3.88E-07	6.51E-07	6.20E-07	4.65E-07	2.95E-07	1.55E-07	2.70E-04	4.50E-07	6.79E-06
W Wardlow from Alameda to I-710	1.57E-02	5.29E-05	5.65E-07	7.85E-08	2.82E-07	2.82E-07	6.28E-07	5.40E-06	9.42E-09	3.92E-07	6.59E-07	6.28E-07	4.71E-07	2.98E-07	1.57E-07	2.73E-04	4.55E-07	6.87E-06

Table B-8
2015 Alternative 1
Maximum Hourly Truck Emissions

	Length	Cong Speed	Port Peak Hour trucks	SCAG Peak Hour trucks	Port Peak hr LNG trucks	Port Peak hr Dsl trucks	SCAG Peak hr Gas trucks	SCAG Peak hr Dsl trucks
Alternative 1, 2015	mile	mph	veh/hr	veh/hr	veh/hr	veh/hr	veh/hr	veh/hr
SR-47 Mainline, New Dock Ramps to Transition		55	2205	29	882	1323		
New Dock Ramps - Cerritos Channel (A1 Line)	0.24	55	2205	29	882	1323	15	14
SB Cerritos Channel - Transition (G1 Line)	0.13	55	1102.5	14.5	441	662	8	7
NB Cerritos Channel - Transition (E1 Line)	0.15	55	1102.5	14.5	441	662	8	7
Mainline Transition to HF Ramps & SR-103		55	935	15	374	561		
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	0.23	55	467.5	7.5	187	281	4	4
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	0.20	55	467.5	7.5	187	281	4	4
Henry Ford Ramps	0.31	20	174	0	70	104	0	0
Henry Ford n/o Ramps to Alameda	0.68	20	281	0	112	169	0	0
SR-47 Extension, HF Ramps to Alameda		50	1271	11	508	763		
SB, 103 Split to Dominguex Channel (D1 Line)	0.70	50	635.5	5.5	254	381	3	3
NB, 103 Split to Dominguex Channel (F1 Line)	0.69	50	635.5	5.5	254	381	3	3
Dominguez Channel - Alameda (I1 Line)	0.83	50	1271	11	508	763	6	5
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.10	45	761	15	304	457	8	7
SR-103 Anaheim to PCH	0.57	45	923	39	369	554	20	19
SR-103 PCH to Sepulveda/Willow	1.02	45	413	65	165	248	34	31
E and W Harry Bridges, Figueroa to start Alameda	1.44	40	417	19	167	250	10	9
Alameda beginning (E Harry Bridges) to Anaheim	0.77	40	532	46	213	319	24	22
Alameda Anaheim to Henry Ford	0.42	40	329	60	132	197	31	29
Alameda, Henry Ford to PCH	0.34	40	535	63	214	321	33	30
Alameda PCH to 405	2.27	35	1648	148	659	989	77	71
Alameda 405 to del Amo	1.72	40	1065	195	426	639	102	93
Alameda, del Amo to South Santa Fe Avenue	0.84	40	1357	190	543	814	99	91
Alameda, South Santa Fe Avenue to SR-91	1.15	40	561	119	224	337	62	57
I-110, "C" Street Interchange to Anaheim	0.49	45	1385	281	554	831	147	134
I-110, Anaheim to PCH	0.80	45	1391	323	556	835	169	154
1-110, PCH to Sepulveda	1.39	45	1444	421	578	866	220	201
I-110, Sepulveda to Carson	1.56	45	1367	543	547	820	284	259
I-110, Carson to Del Amo	1.02	45	1318	617	527	791	323	294
I-110, Del Amo to 405	0.74	45	1277	733	511	766	383	350
I-110, 405 to SR-91	1.09	45	1136	1115	454	682	583	532
I-710, Anaheim to PCH	0.50	40	2953	245	1181	1772	128	117
I-710, PCH to Willow	1.01	40	3224	290	1290	1934	152	138
I-710, Willow to 405	1.52	40	3210	307	1284	1926	161	146
I-710, 405 to Del Amo	1.42	40	3003	530	1201	1802	277	253
I-710, Del Amo to Long Beach Blvd Interchange	1.17	40	2961	565	1184	1777	295	270
I-710, Long Beach Boulevard to SR-91	0.96	40	2932	796	1173	1759	416	380
PCH, I110 to Alameda	2.38	20	249	121	100	149	63	58
PCH, Alameda to SR-103	0.94	20	66	88	26	40	46	42
PCH, SR-103 to I-710	0.98	20	651	78	260	391	41	37
Sepulveda, I-110 to Avalon	1.37	25	35	72	14	21	38	34
Sepulveda, Avalon to Alameda	1.70	25	67	86	27	40	45	41
Sepulveda, Alameda to ICTF	0.67	25	173	42	69	104	22	20
Sepulveda, ICTF to SR-103	0.17	25	413	36	165	248	19	17
Del Amo, I-110 to Wilmington	2.96	25	29	70	12	17	37	33
Del Amo, Wilminton to Alameda	0.77	25	107	160	43	64	84	76
Del Amo, Alameda to I-710	0.87	25	113	172	45	68	90	82
223rd Street, I-110 to Avalon	1.36	25	7	80	3	4	42	38
223rd Street, Avalon to Wilmington	1.23	25	3	80	1	2	42	38
223rd Street, Wilmington to Alameda	0.79	25	109	148	44	65	77	71
W Wardlow from Alameda to I-710	1.30	25	32	106	13	19	55	51

Table B-8
2015 Alternative 1
Maximum Hourly Truck Emissions

	Port - LNG Trucks				Port - Diesel Trucks		SCAG	SCAG - Diesel Trucks	
	LNG Exhst TOG	LNG Exhst Dsl TOG	LNG Exhst PM	LNG Exhst DPM	Dsl Exhst TOG	Dsl Exhst PM	Gasoline Trucks TOG	Dsl Exhst TOG	Dsl Exhst PM
Alternative 1, 2015	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi
SR-47 Mainline, New Dock Ramps to Transition									
New Dock Ramps - Cerritos Channel (A1 Line)	0.5904	0.0311	0.0918	0.0048	0.201	0.092	0.162	0.353	0.153
SB Cerritos Channel - Transition (G1 Line)	0.5904	0.0311	0.0918	0.0048	0.201	0.092	0.162	0.353	0.153
NB Cerritos Channel - Transition (E1 Line)	0.5904	0.0311	0.0918	0.0048	0.201	0.092	0.162	0.353	0.153
Mainline Transition to HF Ramps & SR-103									
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	0.5904	0.0311	0.0918	0.0048	0.201	0.092	0.162	0.353	0.153
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	0.5904	0.0311	0.0918	0.0048	0.201	0.092	0.162	0.353	0.153
Henry Ford Ramps	0.5904	0.0311	0.0918	0.0048	0.463	0.056	0.544	0.756	0.134
Henry Ford n/o Ramps to Alameda	0.5904	0.0311	0.0918	0.0048	0.463	0.056	0.544	0.756	0.134
SR-47 Extension, HF Ramps to Alameda									
SB, 103 Split to Dominguex Channel (D1 Line)	0.5904	0.0311	0.0918	0.0048	0.217	0.080	0.170	0.339	0.138
NB, 103 Split to Dominguex Channel (F1 Line)	0.5904	0.0311	0.0918	0.0048	0.217	0.080	0.170	0.339	0.138
Dominguez Channel - Alameda (I1 Line)	0.5904	0.0311	0.0918	0.0048	0.217	0.080	0.170	0.339	0.138
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	0.5904	0.0311	0.0918	0.0048	0.240	0.070	0.186	0.349	0.126
SR-103 Anaheim to PCH	0.5904	0.0311	0.0918	0.0048	0.240	0.070	0.186	0.349	0.126
SR-103 PCH to Sepulveda/Willow	0.5904	0.0311	0.0918	0.0048	0.240	0.070	0.186	0.349	0.126
E and W Harry Bridges, Figueroa to start Alameda	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
Alameda beginning (E Harry Bridges) to Anaheim	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
Alameda Anaheim to Henry Ford	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
Alameda, Henry Ford to PCH	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
Alameda PCH to 405	0.5904	0.0311	0.0918	0.0048	0.308	0.058	0.252	0.437	0.115
Alameda 405 to del Amo	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
Alameda, del Amo to South Santa Fe Avenue	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
Alameda, South Santa Fe Avenue to SR-91	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
I-110, "C" Street Interchange to Anaheim	0.5904	0.0311	0.0918	0.0048	0.240	0.070	0.186	0.349	0.126
I-110, Anaheim to PCH	0.5904	0.0311	0.0918	0.0048	0.240	0.070	0.186	0.349	0.126
1-110, PCH to Sepulveda	0.5904	0.0311	0.0918	0.0048	0.240	0.070	0.186	0.349	0.126
I-110, Sepulveda to Carson	0.5904	0.0311	0.0918	0.0048	0.240	0.070	0.186	0.349	0.126
I-110, Carson to Del Amo	0.5904	0.0311	0.0918	0.0048	0.240	0.070	0.186	0.349	0.126
I-110, Del Amo to 405	0.5904	0.0311	0.0918	0.0048	0.240	0.070	0.186	0.349	0.126
I-110, 405 to SR-91	0.5904	0.0311	0.0918	0.0048	0.240	0.070	0.186	0.349	0.126
I-710, Anaheim to PCH	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
I-710, PCH to Willow	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
I-710, Willow to 405	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
I-710, 405 to Del Amo	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
I-710, Del Amo to Long Beach Blvd Interchange	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
I-710, Long Beach Boulevard to SR-91	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
PCH, I110 to Alameda	0.5904	0.0311	0.0918	0.0048	0.463	0.056	0.544	0.756	0.134
PCH, Alameda to SR-103	0.5904	0.0311	0.0918	0.0048	0.463	0.056	0.544	0.756	0.134
PCH, SR-103 to I-710	0.5904	0.0311	0.0918	0.0048	0.463	0.056	0.544	0.756	0.134
Sepulveda, I-110 to Avalon	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
Sepulveda, Avalon to Alameda	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
Sepulveda, Alameda to ICTF	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
Sepulveda, ICTF to SR-103	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
Del Amo, I-110 to Wilmington	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
Del Amo, Wilminton to Alameda	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
Del Amo, Alameda to I-710	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
223rd Street, I-110 to Avalon	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
223rd Street, Avalon to Wilmington	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
223rd Street, Wilmington to Alameda	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
W Wardlow from Alameda to I-710	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122

Table B-8
2015 Alternative 1
Maximum Hourly Truck Emissions

	Port		Port		SCAG	SCAG	
	LNG TOG	LNG PM	Dsl + LNG Dsl TOG	Dsl + LNG DPM	Gasoline TOG	Dsl Exhst TOG	Dsl Exhst PM
Alternative 1, 2015	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to Transition							
New Dock Ramps - Cerritos Channel (A1 Line)	0.276	0.043	0.155	0.067	0.0013	0.0026	0.0011
SB Cerritos Channel - Transition (G1 Line)	0.075	0.012	0.04	0.018	0.0004	0.0007	0.0003
NB Cerritos Channel - Transition (E1 Line)	0.086	0.013	0.05	0.021	0.0004	0.0008	0.0003
Mainline Transition to HF Ramps & SR-103	0.000	0.000	0.00	0.000			
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	0.056	0.009	0.03	0.014	0.0003	0.0006	0.0003
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	0.049	0.008	0.03	0.012	0.0003	0.0006	0.0002
Henry Ford Ramps	0.028	0.004	0.03	0.004	0.0000	0.0000	0.0000
Henry Ford n/o Ramps to Alameda	0.099	0.015	0.12	0.015	0.0000	0.0000	0.0000
SR-47 Extension, HF Ramps to Alameda	0.000	0.000	0.00	0.000			
SB, 103 Split to Dominguex Channel (D1 Line)	0.232	0.036	0.14	0.049	0.0008	0.0014	0.0006
NB, 103 Split to Dominguex Channel (F1 Line)	0.228	0.035	0.14	0.048	0.0007	0.0014	0.0005
Dominguez Channel - Alameda (I1 Line)	0.549	0.085	0.33	0.116	0.0018	0.0033	0.0013
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	0.436	0.068	0.29	0.081	0.0035	0.0061	0.0022
SR-103 Anaheim to PCH	0.274	0.043	0.18	0.051	0.0048	0.0082	0.0030
SR-103 PCH to Sepulveda/Willow	0.219	0.034	0.15	0.041	0.0142	0.0243	0.0088
E and W Harry Bridges, Figueroa to start Alameda	0.313	0.049	0.23	0.053	0.0067	0.0110	0.0034
Alameda beginning (E Harry Bridges) to Anaheim	0.213	0.033	0.16	0.036	0.0087	0.0142	0.0044
Alameda Anaheim to Henry Ford	0.072	0.011	0.05	0.012	0.0062	0.0101	0.0032
Alameda, Henry Ford to PCH	0.096	0.015	0.07	0.016	0.0053	0.0087	0.0027
Alameda PCH to 405	1.945	0.302	1.62	0.301	0.0974	0.1542	0.0407
Alameda 405 to del Amo	0.954	0.148	0.70	0.161	0.0823	0.1345	0.0420
Alameda, del Amo to South Santa Fe Avenue	0.594	0.092	0.44	0.100	0.0392	0.0640	0.0200
Alameda, South Santa Fe Avenue to SR-91	0.337	0.052	0.25	0.057	0.0337	0.0550	0.0172
I-110, "C" Street Interchange to Anaheim	0.355	0.055	0.23	0.066	0.0297	0.0507	0.0184
I-110, Anaheim to PCH	0.582	0.090	0.39	0.108	0.0556	0.0952	0.0345
1-110, PCH to Sepulveda	1.042	0.162	0.69	0.194	0.1252	0.2142	0.0776
I-110, Sepulveda to Carson	1.108	0.172	0.73	0.207	0.1814	0.3104	0.1124
I-110, Carson to Del Amo	0.701	0.109	0.46	0.131	0.1352	0.2314	0.0838
I-110, Del Amo to 405	0.493	0.077	0.33	0.092	0.1165	0.1993	0.0722
I-110, 405 to SR-91	0.646	0.100	0.43	0.121	0.2614	0.4472	0.1620
I-710, Anaheim to PCH	0.768	0.119	0.57	0.129	0.0300	0.0490	0.0153
I-710, PCH to Willow	1.688	0.262	1.25	0.284	0.0715	0.1168	0.0365
I-710, Willow to 405	2.546	0.396	1.88	0.428	0.1147	0.1874	0.0585
I-710, 405 to Del Amo	2.220	0.345	1.64	0.373	0.1845	0.3014	0.0941
I-710, Del Amo to Long Beach Blvd Interchange	1.810	0.281	1.34	0.305	0.1627	0.2658	0.0830
I-710, Long Beach Boulevard to SR-91	1.467	0.228	1.08	0.247	0.1876	0.3065	0.0957
PCH, I110 to Alameda	0.308	0.048	0.38	0.046	0.1805	0.2288	0.0404
PCH, Alameda to SR-103	0.032	0.005	0.04	0.005	0.0519	0.0659	0.0116
PCH, SR-103 to I-710	0.333	0.052	0.41	0.050	0.0480	0.0609	0.0108
Sepulveda, I-110 to Avalon	0.025	0.004	0.03	0.004	0.0458	0.0647	0.0127
Sepulveda, Avalon to Alameda	0.059	0.009	0.06	0.009	0.0680	0.0959	0.0188
Sepulveda, Alameda to ICTF	0.061	0.009	0.07	0.009	0.0132	0.0186	0.0036
Sepulveda, ICTF to SR-103	0.037	0.006	0.04	0.005	0.0029	0.0040	0.0008
Del Amo, I-110 to Wilmington	0.045	0.007	0.05	0.006	0.0963	0.1359	0.0266
Del Amo, Wilminton to Alameda	0.043	0.007	0.05	0.006	0.0570	0.0804	0.0157
Del Amo, Alameda to I-710	0.051	0.008	0.06	0.007	0.0698	0.0984	0.0193
223rd Street, I-110 to Avalon	0.005	0.001	0.01	0.001	0.0507	0.0716	0.0140
223rd Street, Avalon to Wilmington	0.002	0.000	0.00	0.000	0.0456	0.0643	0.0126
223rd Street, Wilmington to Alameda	0.045	0.007	0.05	0.007	0.0543	0.0766	0.0150
W Wardlow from Alameda to I-710	0.022	0.003	0.02	0.003	0.0641	0.0904	0.0177

Table B-8
2015 Alternative 1
Maximum Hourly Truck Emissions

	Maximum Hourly Toxic Emissions from Trucks														
	DPM	Acetaldehyde	Acrolein	Ammonia	Antimony	Arsenic	Benzene	Bromine	1,3-Butadiene	Cadmium	Chlorine	Chromium (hex)	Copper	Ethylbenzene	Formaldehyde
	9901	75070	107028	7664417	7440360	7440382	71432	7726956	106990	7440439	7782505	18540299	7440508	100414	50000
Alternative 1, 2015	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to Transition															
New Dock Ramps - Cerritos Channel (A1 Line)	6.76E-02	1.16E-02	1.70E-06	2.28E-04	2.43E-06	3.38E-07	3.19E-03	2.43E-06	3.07E-04	2.71E-06	2.33E-05	4.06E-08	1.69E-06	4.81E-04	2.32E-02
SB Cerritos Channel - Transition (G1 Line)	1.83E-02	3.14E-03	4.60E-07	6.17E-05	6.59E-07	9.16E-08	8.64E-04	6.59E-07	8.31E-05	7.33E-07	6.30E-06	1.10E-08	4.58E-07	1.30E-04	6.29E-03
NB Cerritos Channel - Transition (E1 Line)	2.11E-02	3.63E-03	5.31E-07	7.12E-05	7.61E-07	1.06E-07	9.97E-04	7.61E-07	9.59E-05	8.45E-07	7.27E-06	1.27E-08	5.28E-07	1.50E-04	7.26E-03
Mainline Transition to HF Ramps & SR-103	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	1.38E-02	2.37E-03	4.21E-07	4.65E-05	4.97E-07	6.90E-08	6.52E-04	4.97E-07	6.29E-05	5.52E-07	4.74E-06	8.28E-09	3.45E-07	9.81E-05	4.74E-03
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	1.20E-02	2.06E-03	3.66E-07	4.04E-05	4.32E-07	6.00E-08	5.67E-04	4.32E-07	5.47E-05	4.80E-07	4.13E-06	7.20E-09	3.00E-07	8.53E-05	4.12E-03
Henry Ford Ramps	4.21E-03	2.54E-03	0.00E+00	1.42E-05	1.52E-07	2.11E-08	6.91E-04	1.52E-07	6.56E-05	1.68E-07	1.45E-06	2.53E-09	1.05E-07	1.05E-04	5.08E-03
Henry Ford n/o Ramps to Alameda	1.49E-02	8.99E-03	0.00E+00	5.03E-05	5.37E-07	7.46E-08	2.45E-03	5.37E-07	2.32E-04	5.97E-07	5.13E-06	8.95E-09	3.73E-07	3.73E-04	1.80E-02
SR-47 Extension, HF Ramps to Alameda	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB, 103 Split to Dominguex Channel (D1 Line)	4.96E-02	1.04E-02	9.91E-07	1.67E-04	1.79E-06	2.48E-07	2.84E-03	1.79E-06	2.73E-04	1.98E-06	1.71E-05	2.98E-08	1.24E-06	4.31E-04	2.08E-02
NB, 103 Split to Dominguex Channel (F1 Line)	4.89E-02	1.02E-02	9.77E-07	1.65E-04	1.76E-06	2.44E-07	2.80E-03	1.76E-06	2.69E-04	1.96E-06	1.68E-05	2.93E-08	1.22E-06	4.25E-04	2.05E-02
Dominguez Channel - Alameda (I1 Line)	1.18E-01	2.46E-02	2.35E-06	3.96E-04	4.23E-06	5.88E-07	6.75E-03	4.23E-06	6.46E-04	4.70E-06	4.05E-05	7.06E-08	2.94E-06	1.02E-03	4.93E-02
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	8.35E-02	2.17E-02	4.64E-06	2.81E-04	3.01E-06	4.17E-07	5.98E-03	3.01E-06	5.80E-04	3.34E-06	2.87E-05	5.01E-08	2.09E-06	8.99E-04	4.34E-02
SR-103 Anaheim to PCH	5.40E-02	1.40E-02	6.25E-06	1.82E-04	1.95E-06	2.70E-07	3.91E-03	1.95E-06	3.87E-04	2.16E-06	1.86E-05	3.24E-08	1.35E-06	5.78E-04	2.80E-02
SR-103 PCH to Sepulveda/Willow	4.97E-02	1.25E-02	1.86E-05	1.68E-04	1.79E-06	2.49E-07	3.74E-03	1.79E-06	4.01E-04	1.99E-06	1.71E-05	2.98E-08	1.24E-06	5.17E-04	2.52E-02
E and W Harry Bridges, Figueroa to start Alameda	5.62E-02	1.79E-02	8.81E-06	1.89E-04	2.02E-06	2.81E-07	5.02E-03	2.02E-06	4.98E-04	2.25E-06	1.93E-05	3.37E-08	1.40E-06	7.40E-04	3.58E-02
Alameda beginning (E Harry Bridges) to Anaheim	4.03E-02	1.27E-02	1.14E-05	1.36E-04	1.45E-06	2.02E-07	3.65E-03	1.45E-06	3.74E-04	1.61E-06	1.39E-05	2.42E-08	1.01E-06	5.24E-04	2.54E-02
Alameda Anaheim to Henry Ford	1.53E-02	4.69E-03	8.13E-06	5.16E-05	5.52E-07	7.66E-08	1.42E-03	5.52E-07	1.55E-04	6.13E-07	5.27E-06	9.19E-09	3.83E-07	1.94E-04	9.45E-03
Alameda, Henry Ford to PCH	1.88E-02	5.86E-03	6.96E-06	6.34E-05	6.77E-07	9.41E-08	1.72E-03	6.77E-07	1.80E-04	7.52E-07	6.47E-06	1.13E-08	4.70E-07	2.42E-04	1.18E-02
Alameda PCH to 405	3.41E-01	1.31E-01	1.28E-04	1.15E-03	1.23E-05	1.71E-06	3.80E-02	1.23E-05	3.92E-03	1.36E-05	1.17E-04	2.05E-07	8.53E-06	5.42E-03	2.63E-01
Alameda 405 to del Amo	2.03E-01	6.20E-02	1.08E-04	6.82E-04	7.29E-06	1.01E-06	1.88E-02	7.29E-06	2.05E-03	8.10E-06	6.97E-05	1.22E-07	5.06E-06	2.56E-03	1.25E-01
Alameda, del Amo to South Santa Fe Avenue	1.20E-01	3.71E-02	5.13E-05	4.04E-04	4.32E-06	6.00E-07	1.10E-02	4.32E-06	1.17E-03	4.80E-06	4.13E-05	7.19E-08	3.00E-06	1.53E-03	7.46E-02
Alameda, South Santa Fe Avenue to SR-91	7.38E-02	2.25E-02	4.41E-05	2.49E-04	2.66E-06	3.69E-07	6.90E-03	2.66E-06	7.63E-04	2.95E-06	2.54E-05	4.43E-08	1.85E-06	9.27E-04	4.53E-02
I-110, "C" Street Interchange to Anaheim	8.45E-02	2.11E-02	3.88E-05	2.85E-04	3.04E-06	4.23E-07	6.44E-03	3.04E-06	7.07E-04	3.38E-06	2.91E-05	5.07E-08	2.11E-06	8.71E-04	4.25E-02
I-110, Anaheim to PCH	1.43E-01	3.55E-02	7.29E-05	4.82E-04	5.15E-06	7.15E-07	1.10E-02	5.15E-06	1.22E-03	5.72E-06	4.92E-05	8.58E-08	3.57E-06	1.47E-03	7.16E-02
1-110, PCH to Sepulveda	2.72E-01	6.70E-02	1.64E-04	9.16E-04	9.79E-06	1.36E-06	2.11E-02	9.79E-06	2.41E-03	1.09E-05	9.36E-05	1.63E-07	6.80E-06	2.76E-03	1.35E-01
I-110, Sepulveda to Carson	3.19E-01	7.75E-02	2.38E-04	1.08E-03	1.15E-05	1.60E-06	2.53E-02	1.15E-05	2.99E-03	1.28E-05	1.10E-04	1.91E-07	7.98E-06	3.19E-03	1.57E-01
I-110, Carson to Del Amo	2.15E-01	5.17E-02	1.77E-04	7.23E-04	7.72E-06	1.07E-06	1.72E-02	7.72E-06	2.07E-03	8.58E-06	7.38E-05	1.29E-07	5.36E-06	2.12E-03	1.05E-01
I-110, Del Amo to 405	1.64E-01	3.91E-02	1.53E-04	5.53E-04	5.91E-06	8.20E-07	1.34E-02	5.91E-06	1.64E-03	6.56E-06	5.64E-05	9.85E-08	4.10E-06	1.60E-03	7.93E-02
I-110, 405 to SR-91	2.83E-01	6.54E-02	3.42E-04	9.52E-04	1.02E-05	1.41E-06	2.39E-02	1.02E-05	3.11E-03	1.13E-05	9.72E-05	1.70E-07	7.06E-06	2.67E-03	1.33E-01
I-710, Anaheim to PCH	1.44E-01	4.54E-02	3.93E-05	4.87E-04	5.20E-06	7.22E-07	1.31E-02	5.20E-06	1.34E-03	5.78E-06	4.97E-05	8.67E-08	3.61E-06	1.88E-03	9.12E-02
I-710, PCH to Willow	3.20E-01	1.01E-01	9.37E-05	1.08E-03	1.15E-05	1.60E-06	2.90E-02	1.15E-05	2.99E-03	1.28E-05	1.10E-04	1.92E-07	8.01E-06	4.16E-03	2.02E-01
I-710, Willow to 405	4.87E-01	1.52E-01	1.50E-04	1.64E-03	1.75E-05	2.43E-06	4.42E-02	1.75E-05	4.56E-03	1.95E-05	1.67E-04	2.92E-07	1.22E-05	6.31E-03	3.06E-01
I-710, 405 to Del Amo	4.68E-01	1.43E-01	2.42E-04	1.58E-03	1.68E-05	2.34E-06	4.33E-02	1.68E-05	4.71E-03	1.87E-05	1.61E-04	2.81E-07	1.17E-05	5.92E-03	2.89E-01
I-710, Del Amo to Long Beach Blvd Interchange	3.88E-01	1.18E-01	2.13E-04	1.31E-03	1.40E-05	1.94E-06	3.60E-02	1.40E-05	3.94E-03	1.55E-05	1.33E-04	2.33E-07	9.69E-06	4.89E-03	2.39E-01
I-710, Long Beach Boulevard to SR-91	3.43E-01	1.03E-01	2.46E-04	1.15E-03	1.23E-05	1.71E-06	3.24E-02	1.23E-05	3.68E-03	1.37E-05	1.18E-04	2.06E-07	8.56E-06	4.24E-03	2.08E-01
PCH, I110 to Alameda	8.67E-02	4.54E-02	2.36E-04	2.92E-04	3.12E-06	4.33E-07	1.66E-02	3.12E-06	2.15E-03	3.47E-06	2.98E-05	5.20E-08	2.17E-06	1.85E-03	9.25E-02
PCH, Alameda to SR-103	1.65E-02	7.97E-03	6.80E-05	5.56E-05	5.94E-07	8.24E-08	3.38E-03	5.94E-07	4.88E-04	6.60E-07	5.67E-06	9.89E-09	4.12E-07	3.22E-04	1.64E-02
PCH, SR-103 to I-710	6.06E-02	3.47E-02	6.29E-05	2.04E-04	2.18E-06	3.03E-07	1.06E-02	2.18E-06	1.16E-03	2.43E-06	2.09E-05	3.64E-08	1.52E-06	1.43E-03	6.99E-02
Sepulveda, I-110 to Avalon	1.63E-02	6.91E-03	6.01E-05	5.49E-05	5.86E-07	8.14E-08	2.95E-03	5.86E-07	4.28E-04	6.52E-07	5.60E-06	9.77E-09	4.07E-07	2.79E-04	1.43E-02
Sepulveda, Avalon to Alameda	2.74E-02	1.20E-02	8.90E-05	9.22E-05	9.86E-07	1.37E-07	4.85E-03	9.86E-07	6.79E-04	1.10E-06	9.42E-06	1.64E-08	6.85E-07	4.87E-04	2.47E-02
Sepulveda, Alameda to ICTF	1.25E-02	6.24E-03	1.73E-05	4.20E-05	4.49E-07	6.23E-08	2.00E-03	4.49E-07	2.33E-04	4.99E-07	4.29E-06	7.48E-09	3.12E-07	2.57E-04	1.26E-02
Sepulveda, ICTF to SR-103	6.15E-03	3.23E-03	3.76E-06	2.07E-05	2.21E-07	3.08E-08	9.47E-04	2.21E-07	9.91E-05	2.46E-07	2.12E-06	3.69E-09	1.54E-07	1.34E-04	6.50E-03
Del Amo, I-110 to Wilmington	3.31E-02	1.39E-02	1.26E-04	1.12E-04	1.19E-06	1.65E-07	6.03E-03	1.19E-06	8.83E-04	1.32E-06	1.14E-05	1.99E-08	8.27E-07	5.62E-04	2.87E-02
Del Amo, Wilminton to Alameda	2.19E-02	9.51E-03	7.46E-05	7.39E-05	7.90E-07	1.10E-07	3.92E-03	7.90E-07	5.55E-04	8.77E-07	7.54E-06	1.32E-08	5.48E-07	3.86E-04	1.96E-02
Del Amo, Alameda to I-710	2.67E-02	1.16E-02	9.14E-05	9.00E-05	9.62E-07	1.34E-07	4.78E-03	9.62E-07	6.78E-04	1.07E-06	9.19E-06	1.60E-08	6.68E-07	4.69E-04	2.38E-02
223rd Street, I-110 to Avalon	1.47E-02	5.85E-03	6.64E-05	4.96E-05	5.30E-07	7.36E-08	2.77E-03	5.30E-07	4.27E-04	5.89E-07	5.07E-06	8.84E-09	3.68E-07	2.35E-04	1.22E-02
223rd Street, Avalon to Wilmington	1.29E-02	5.06E-03	5.97E-05	4.34E-05	4.63E-07	6.43E-08	2.44E-03	4.63E-07	3.78E-04	5.15E-07	4.43E-06	7.72E-09	3.22E-07	2.03E-04	1.05E-02
223rd Street, Wilmington to Alameda	2.15E-02	9.40E-03	7.12E-05	7.25E-05	7.74E-07	1.08E-07	3.82E-03	7.74E-07	5.38E-04	8.60E-07	7.40E-06	1.29E-08	5.38E-07	3.81E-04	1.93E-02
W Wardlow from Alameda to I-710	2.08E-02	8.61E-03	8.40E-05	7.02E-05	7.50E-07	1.04E-07	3.84E-03	7.50E-07	5.71E-04	8.34E-07	7.17E-06	1.25E-08	5.21E-07	3.47E-04	1.78E-02

Table B-8
2015 Alternative 1
Maximum Hourly Truck Emissions

	Maximum Hourly Toxic Emissions from Trucks (continued)														
	n-Hexane	Lead	Manganese	MEK	Mercury	Methanol	Nickel	Propylene	Selenium	Sthrene	Sulfates	Toluene	Vanadium	Xylene	Zinc
	110543	7439921	7439965	78933	7439976	67561	7440020	115071	7782492	100425	9960	108883	7440622	1330207	7440666
Alternative 1, 2015	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to Transition															
New Dock Ramps - Cerritos Channel (A1 Line)	2.48E-04	2.84E-06	2.71E-06	2.33E-03	2.03E-06	4.73E-05	1.29E-06	4.10E-03	6.76E-07	9.15E-05	1.18E-03	2.32E-03	1.96E-06	1.64E-03	2.96E-05
SB Cerritos Channel - Transition (G1 Line)	6.71E-05	7.69E-07	7.33E-07	6.31E-04	5.50E-07	1.28E-05	3.48E-07	1.11E-03	1.83E-07	2.48E-05	3.19E-04	6.29E-04	5.31E-07	4.45E-04	8.02E-06
NB Cerritos Channel - Transition (E1 Line)	7.74E-05	8.88E-07	8.45E-07	7.28E-04	6.34E-07	1.48E-05	4.02E-07	1.28E-03	2.11E-07	2.86E-05	3.68E-04	7.26E-04	6.13E-07	5.13E-04	9.26E-06
Mainline Transition to HF Ramps & SR-103	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	5.05E-05	5.79E-07	5.52E-07	4.75E-04	4.14E-07	9.65E-06	2.62E-07	8.36E-04	1.38E-07	1.87E-05	2.40E-04	4.74E-04	4.00E-07	3.35E-04	6.04E-06
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	4.39E-05	5.04E-07	4.80E-07	4.13E-04	3.60E-07	8.39E-06	2.28E-07	7.27E-04	1.20E-07	1.62E-05	2.09E-04	4.12E-04	3.48E-07	2.91E-04	5.25E-06
Henry Ford Ramps	5.42E-05	1.77E-07	1.68E-07	5.10E-04	1.26E-07	1.04E-05	8.00E-08	8.96E-04	4.21E-08	2.00E-05	7.33E-05	5.08E-04	1.22E-07	3.59E-04	1.84E-06
Henry Ford n/o Ramps to Alameda	1.92E-04	6.27E-07	5.97E-07	1.81E-03	4.48E-07	3.67E-05	2.83E-07	3.18E-03	1.49E-07	7.09E-05	2.60E-04	1.80E-03	4.33E-07	1.27E-03	6.53E-06
SR-47 Extension, HF Ramps to Alameda	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB, 103 Split to Dominguex Channel (D1 Line)	2.22E-04	2.08E-06	1.98E-06	2.09E-03	1.49E-06	4.24E-05	9.42E-07	3.67E-03	4.96E-07	8.19E-05	8.63E-04	2.08E-03	1.44E-06	1.47E-03	2.17E-05
NB, 103 Split to Dominguex Channel (F1 Line)	2.19E-04	2.05E-06	1.96E-06	2.06E-03	1.47E-06	4.18E-05	9.29E-07	3.62E-03	4.89E-07	8.08E-05	8.50E-04	2.05E-03	1.42E-06	1.45E-03	2.14E-05
Dominguez Channel - Alameda (I1 Line)	5.26E-04	4.94E-06	4.70E-06	4.95E-03	3.53E-06	1.00E-04	2.23E-06	8.70E-03	1.18E-06	1.94E-04	2.05E-03	4.93E-03	3.41E-06	3.49E-03	5.15E-05
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	4.63E-04	3.51E-06	3.34E-06	4.35E-03	2.50E-06	8.84E-05	1.59E-06	7.65E-03	8.35E-07	1.71E-04	1.45E-03	4.34E-03	2.42E-06	3.07E-03	3.66E-05
SR-103 Anaheim to PCH	2.98E-04	2.27E-06	2.16E-06	2.80E-03	1.62E-06	5.69E-05	1.03E-06	4.92E-03	5.40E-07	1.10E-04	9.40E-04	2.79E-03	1.57E-06	1.97E-03	2.37E-05
SR-103 PCH to Sepulveda/Willow	2.66E-04	2.09E-06	1.99E-06	2.51E-03	1.49E-06	5.09E-05	9.45E-07	4.40E-03	4.97E-07	9.84E-05	8.65E-04	2.50E-03	1.44E-06	1.77E-03	2.18E-05
E and W Harry Bridges, Figueroa to start Alameda	3.81E-04	2.36E-06	2.25E-06	3.58E-03	1.68E-06	7.27E-05	1.07E-06	6.30E-03	5.62E-07	1.41E-04	9.77E-04	3.57E-03	1.63E-06	2.52E-03	2.46E-05
Alameda beginning (E Harry Bridges) to Anaheim	2.70E-04	1.69E-06	1.61E-06	2.54E-03	1.21E-06	5.15E-05	7.66E-07	4.46E-03	4.03E-07	9.96E-05	7.01E-04	2.53E-03	1.17E-06	1.79E-03	1.77E-05
Alameda Anaheim to Henry Ford	9.97E-05	6.44E-07	6.13E-07	9.38E-04	4.60E-07	1.91E-05	2.91E-07	1.65E-03	1.53E-07	3.68E-05	2.67E-04	9.36E-04	4.44E-07	6.61E-04	6.71E-06
Alameda, Henry Ford to PCH	1.25E-04	7.90E-07	7.52E-07	1.17E-03	5.64E-07	2.38E-05	3.57E-07	2.06E-03	1.88E-07	4.60E-05	3.27E-04	1.17E-03	5.46E-07	8.26E-04	8.24E-06
Alameda PCH to 405	2.79E-03	1.43E-05	1.36E-05	2.63E-02	1.02E-05	5.34E-04	6.48E-06	4.62E-02	3.41E-06	1.03E-03	5.94E-03	2.62E-02	9.89E-06	1.85E-02	1.49E-04
Alameda 405 to del Amo	1.32E-03	8.51E-06	8.10E-06	1.24E-02	6.08E-06	2.52E-04	3.85E-06	2.18E-02	2.03E-06	4.87E-04	3.52E-03	1.24E-02	5.87E-06	8.74E-03	8.87E-05
Alameda, del Amo to South Santa Fe Avenue	7.89E-04	5.04E-06	4.80E-06	7.42E-03	3.60E-06	1.51E-04	2.28E-06	1.31E-02	1.20E-06	2.92E-04	2.09E-03	7.40E-03	3.48E-06	5.23E-03	5.25E-05
Alameda, South Santa Fe Avenue to SR-91	4.77E-04	3.10E-06	2.95E-06	4.49E-03	2.22E-06	9.11E-05	1.40E-06	7.89E-03	7.38E-07	1.76E-04	1.28E-03	4.47E-03	2.14E-06	3.16E-03	3.23E-05
I-110, "C" Street Interchange to Anaheim	4.48E-04	3.55E-06	3.38E-06	4.22E-03	2.54E-06	8.57E-05	1.61E-06	7.42E-03	8.45E-07	1.66E-04	1.47E-03	4.21E-03	2.45E-06	2.97E-03	3.70E-05
I-110, Anaheim to PCH	7.54E-04	6.01E-06	5.72E-06	7.10E-03	4.29E-06	1.44E-04	2.72E-06	1.25E-02	1.43E-06	2.79E-04	2.49E-03	7.08E-03	4.15E-06	5.00E-03	6.26E-05
1-110, PCH to Sepulveda	1.42E-03	1.14E-05	1.09E-05	1.34E-02	8.16E-06	2.71E-04	5.17E-06	2.35E-02	2.72E-06	5.25E-04	4.73E-03	1.33E-02	7.89E-06	9.42E-03	1.19E-04
I-110, Sepulveda to Carson	1.64E-03	1.34E-05	1.28E-05	1.54E-02	9.57E-06	3.13E-04	6.06E-06	2.71E-02	3.19E-06	6.06E-04	5.55E-03	1.54E-02	9.26E-06	1.09E-02	1.40E-04
I-110, Carson to Del Amo	1.09E-03	9.01E-06	8.58E-06	1.03E-02	6.44E-06	2.09E-04	4.08E-06	1.81E-02	2.15E-06	4.04E-04	3.73E-03	1.02E-02	6.22E-06	7.24E-03	9.40E-05
I-110, Del Amo to 405	8.25E-04	6.89E-06	6.56E-06	7.76E-03	4.92E-06	1.58E-04	3.12E-06	1.37E-02	1.64E-06	3.05E-04	2.86E-03	7.74E-03	4.76E-06	5.47E-03	7.19E-05
I-110, 405 to SR-91	1.37E-03	1.19E-05	1.13E-05	1.29E-02	8.48E-06	2.63E-04	5.37E-06	2.27E-02	2.83E-06	5.08E-04	4.92E-03	1.29E-02	8.19E-06	9.11E-03	1.24E-04
I-710, Anaheim to PCH	9.67E-04	6.07E-06	5.78E-06	9.10E-03	4.33E-06	1.85E-04	2.75E-06	1.60E-02	1.44E-06	3.57E-04	2.51E-03	9.08E-03	4.19E-06	6.41E-03	6.33E-05
I-710, PCH to Willow	2.14E-03	1.35E-05	1.28E-05	2.01E-02	9.61E-06	4.09E-04	6.09E-06	3.54E-02	3.20E-06	7.91E-04	5.57E-03	2.01E-02	9.29E-06	1.42E-02	1.40E-04
I-710, Willow to 405	3.25E-03	2.04E-05	1.95E-05	3.05E-02	1.46E-05	6.20E-04	9.25E-06	5.37E-02	4.87E-06	1.20E-03	8.47E-03	3.05E-02	1.41E-05	2.15E-02	2.13E-04
I-710, 405 to Del Amo	3.05E-03	1.96E-05	1.87E-05	2.87E-02	1.40E-05	5.82E-04	8.88E-06	5.04E-02	4.68E-06	1.13E-03	8.13E-03	2.86E-02	1.36E-05	2.02E-02	2.05E-04
I-710, Del Amo to Long Beach Blvd Interchange	2.52E-03	1.63E-05	1.55E-05	2.37E-02	1.16E-05	4.81E-04	7.36E-06	4.16E-02	3.88E-06	9.30E-04	6.74E-03	2.36E-02	1.12E-05	1.67E-02	1.70E-04
I-710, Long Beach Boulevard to SR-91	2.18E-03	1.44E-05	1.37E-05	2.05E-02	1.03E-05	4.17E-04	6.51E-06	3.61E-02	3.43E-06	8.06E-04	5.96E-03	2.05E-02	9.93E-06	1.45E-02	1.50E-04
PCH, I110 to Alameda	9.54E-04	3.64E-06	3.47E-06	8.98E-03	2.60E-06	1.82E-04	1.65E-06	1.58E-02	8.67E-07	3.53E-04	1.51E-03	8.95E-03	2.51E-06	6.33E-03	3.80E-05
PCH, Alameda to SR-103	1.66E-04	6.93E-07	6.60E-07	1.56E-03	4.95E-07	3.17E-05	3.13E-07	2.74E-03	1.65E-07	6.13E-05	2.87E-04	1.56E-03	4.78E-07	1.10E-03	7.22E-06
PCH, SR-103 to I-710	7.37E-04	2.55E-06	2.43E-06	6.94E-03	1.82E-06	1.41E-04	1.15E-06	1.22E-02	6.06E-07	2.72E-04	1.06E-03	6.92E-03	1.76E-06	4.89E-03	2.66E-05
Sepulveda, I-110 to Avalon	1.44E-04	6.84E-07	6.52E-07	1.35E-03	4.89E-07	2.75E-05	3.09E-07	2.38E-03	1.63E-07	5.31E-05	2.83E-04	1.35E-03	4.72E-07	9.54E-04	7.13E-06
Sepulveda, Avalon to Alameda	2.51E-04	1.15E-06	1.10E-06	2.36E-03	8.21E-07	4.79E-05	5.20E-07	4.15E-03	2.74E-07	9.27E-05	4.76E-04	2.35E-03	7.94E-07	1.66E-03	1.20E-05
Sepulveda, Alameda to ICTF	1.32E-04	5.24E-07	4.99E-07	1.24E-03	3.74E-07	2.52E-05	2.37E-07	2.19E-03	1.25E-07	4.88E-05	2.17E-04	1.24E-03	3.62E-07	8.76E-04	5.46E-06
Sepulveda, ICTF to SR-103	6.88E-05	2.58E-07	2.46E-07	6.47E-04	1.85E-07	1.31E-05	1.17E-07	1.14E-03	6.15E-08	2.54E-05	1.07E-04	6.45E-04	1.78E-07	4.56E-04	2.69E-06
Del Amo, I-110 to Wilmington	2.89E-04	1.39E-06	1.32E-06	2.72E-03	9.93E-07	5.52E-05	6.29E-07	4.78E-03	3.31E-07	1.07E-04	5.76E-04	2.71E-03	9.60E-07	1.92E-03	1.45E-05
Del Amo, Wilminton to Alameda	1.98E-04	9.21E-07	8.77E-07	1.87E-03	6.58E-07	3.79E-05	4.17E-07	3.28E-03	2.19E-07	7.33E-05	3.82E-04	1.86E-03	6.36E-07	1.32E-03	9.61E-06
Del Amo, Alameda to I-710	2.41E-04	1.12E-06	1.07E-06	2.27E-03	8.02E-07	4.61E-05	5.08E-07	3.99E-03	2.67E-07	8.92E-05	4.65E-04	2.27E-03	7.75E-07	1.60E-03	1.17E-05
223rd Street, I-110 to Avalon	1.21E-04	6.19E-07	5.89E-07	1.14E-03	4.42E-07	2.31E-05	2.80E-07	2.00E-03	1.47E-07	4.46E-05	2.56E-04	1.13E-03	4.27E-07	8.01E-04	6.45E-06
223rd Street, Avalon to Wilmington	1.04E-04	5.41E-07	5.15E-07	9.81E-04	3.86E-07	1.99E-05	2.45E-07	1.72E-03	1.29E-07	3.85E-05	2.24E-04	9.78E-04	3.73E-07	6.91E-04	5.64E-06
223rd Street, Wilmington to Alameda	1.96E-04	9.03E-07	8.60E-07	1.85E-03	6.45E-07	3.75E-05	4.09E-07	3.24E-03	2.15E-07	7.25E-05	3.74E-04	1.84E-03	6.24E-07	1.30E-03	9.42E-06
W Wardlow from Alameda to I-710	1.79E-04	8.76E-07	8.34E-07	1.68E-03	6.25E-07	3.41E-05	3.96E-07	2.95E-03	2.08E-07	6.60E-05	3.63E-04	1.68E-03	6.05E-07	1.18E-03	9.13E-06

Table B-8
2015 Alternative 1
Maximum Hourly Truck Emissions

	Port Trucks - - LNG Exhaust								Port Trucks - - LNG Exhaust								
	TOG	Acetaldehyde	Benzene	Formaldehyde	n-Hexane	Propylene	Toluene	Xylenes	PM10	Bromine	Chlorine	Chromium (hex)	Copper	Manganese	Nickel	Sulfates	Zinc
		75070	71432	50000	110543	115071	108883	1330207		7726956	7782505	18540299	7440508	7439965	7440020	9960	7440666
Alternative 1, 2015	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to Transition																	
New Dock Ramps - Cerritos Channel (A1 Line)	2.76E-01	8.27E-05	3.03E-04	2.23E-03	5.51E-05	4.66E-03	1.10E-04	5.51E-05	0.043	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SB Cerritos Channel - Transition (G1 Line)	7.46E-02	2.24E-05	8.21E-05	6.04E-04	1.49E-05	1.26E-03	2.99E-05	1.49E-05	0.012	2.66E-10	3.72E-08	1.33E-11	2.66E-10	2.66E-10	2.66E-10	2.39E-07	2.66E-10
NB Cerritos Channel - Transition (E1 Line)	8.61E-02	2.58E-05	9.47E-05	6.97E-04	1.72E-05	1.46E-03	3.44E-05	1.72E-05	0.013	3.06E-10	4.29E-08	1.53E-11	3.06E-10	3.06E-10	3.06E-10	2.76E-07	3.06E-10
Mainline Transition to HF Ramps & SR-103	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	5.60E-02	1.68E-05	6.16E-05	4.53E-04	1.12E-05	9.46E-04	2.24E-05	1.12E-05	0.009	2.00E-10	2.80E-08	1.00E-11	2.00E-10	2.00E-10	2.00E-10	1.80E-07	2.00E-10
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	4.87E-02	1.46E-05	5.36E-05	3.94E-04	9.74E-06	8.23E-04	1.95E-05	9.74E-06	0.008	1.74E-10	2.43E-08	8.69E-12	1.74E-10	1.74E-10	1.74E-10	1.57E-07	1.74E-10
Henry Ford Ramps	2.81E-02	8.43E-06	3.09E-05	2.27E-04	5.62E-06	4.75E-04	1.12E-05	5.62E-06	0.004	6.11E-11	8.55E-09	3.05E-12	6.11E-11	6.11E-11	6.11E-11	5.50E-08	6.11E-11
Henry Ford n/o Ramps to Alameda	9.95E-02	2.98E-05	1.09E-04	8.06E-04	1.99E-05	1.68E-03	3.98E-05	1.99E-05	0.015	2.16E-10	3.03E-08	1.08E-11	2.16E-10	2.16E-10	2.16E-10	1.95E-07	2.16E-10
SR-47 Extension, HF Ramps to Alameda	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB, 103 Split to Dominguex Channel (D1 Line)	2.32E-01	6.95E-05	2.55E-04	1.88E-03	4.63E-05	3.91E-03	9.27E-05	4.63E-05	0.036	7.19E-10	1.01E-07	3.59E-11	7.19E-10	7.19E-10	7.19E-10	6.47E-07	7.19E-10
NB, 103 Split to Dominguex Channel (F1 Line)	2.28E-01	6.85E-05	2.51E-04	1.85E-03	4.57E-05	3.86E-03	9.13E-05	4.57E-05	0.035	7.09E-10	9.92E-08	3.54E-11	7.09E-10	7.09E-10	7.09E-10	6.38E-07	7.09E-10
Dominguez Channel - Alameda (I1 Line)	5.49E-01	1.65E-04	6.04E-04	4.45E-03	1.10E-04	9.28E-03	2.20E-04	1.10E-04	0.085	1.71E-09	2.39E-07	8.53E-11	1.71E-09	1.71E-09	1.71E-09	1.53E-06	1.71E-09
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	4.36E-01	1.31E-04	4.79E-04	3.53E-03	8.72E-05	7.37E-03	1.74E-04	8.72E-05	0.068	1.21E-09	1.69E-07	6.05E-11	1.21E-09	1.21E-09	1.21E-09	1.09E-06	1.21E-09
SR-103 Anaheim to PCH	2.74E-01	8.22E-05	3.01E-04	2.22E-03	5.48E-05	4.63E-03	1.10E-04	5.48E-05	0.043	7.84E-10	1.10E-07	3.92E-11	7.84E-10	7.84E-10	7.84E-10	7.05E-07	7.84E-10
SR-103 PCH to Sepulveda/Willow	2.19E-01	6.58E-05	2.41E-04	1.78E-03	4.39E-05	3.71E-03	8.77E-05	4.39E-05	0.034	7.21E-10	1.01E-07	3.61E-11	7.21E-10	7.21E-10	7.21E-10	6.49E-07	7.21E-10
E and W Harry Bridges, Figueroa to start Alameda	3.13E-01	9.40E-05	3.45E-04	2.54E-03	6.27E-05	5.30E-03	1.25E-04	6.27E-05	0.049	8.14E-10	1.14E-07	4.07E-11	8.14E-10	8.14E-10	8.14E-10	7.33E-07	8.14E-10
Alameda beginning (E Harry Bridges) to Anaheim	2.13E-01	6.40E-05	2.35E-04	1.73E-03	4.26E-05	3.60E-03	8.53E-05	4.26E-05	0.033	5.84E-10	8.18E-08	2.92E-11	5.84E-10	5.84E-10	5.84E-10	5.26E-07	5.84E-10
Alameda Anaheim to Henry Ford	7.23E-02	2.17E-05	7.95E-05	5.85E-04	1.45E-05	1.22E-03	2.89E-05	1.45E-05	0.011	2.22E-10	3.11E-08	1.11E-11	2.22E-10	2.22E-10	2.22E-10	2.00E-07	2.22E-10
Alameda, Henry Ford to PCH	9.57E-02	2.87E-05	1.05E-04	7.75E-04	1.91E-05	1.62E-03	3.83E-05	1.91E-05	0.015	2.73E-10	3.82E-08	1.36E-11	2.73E-10	2.73E-10	2.73E-10	2.45E-07	2.73E-10
Alameda PCH to 405	1.95E+00	5.84E-04	2.14E-03	1.58E-02	3.89E-04	3.29E-02	7.78E-04	3.89E-04	0.302	4.95E-09	6.93E-07	2.47E-10	4.95E-09	4.95E-09	4.95E-09	4.45E-06	4.95E-09
Alameda 405 to del Amo	9.54E-01	2.86E-04	1.05E-03	7.73E-03	1.91E-04	1.61E-02	3.82E-04	1.91E-04	0.148	2.94E-09	4.11E-07	1.47E-10	2.94E-09	2.94E-09	2.94E-09	2.64E-06	2.94E-09
Alameda, del Amo to South Santa Fe Avenue	5.94E-01	1.78E-04	6.53E-04	4.81E-03	1.19E-04	1.00E-02	2.38E-04	1.19E-04	0.092	1.74E-09	2.43E-07	8.69E-11	1.74E-09	1.74E-09	1.74E-09	1.56E-06	1.74E-09
Alameda, South Santa Fe Avenue to SR-91	3.37E-01	1.01E-04	3.71E-04	2.73E-03	6.74E-05	5.69E-03	1.35E-04	6.74E-05	0.052	1.07E-09	1.50E-07	5.35E-11	1.07E-09	1.07E-09	1.07E-09	9.64E-07	1.07E-09
I-110, "C" Street Interchange to Anaheim	3.55E-01	1.06E-04	3.90E-04	2.87E-03	7.09E-05	5.99E-03	1.42E-04	7.09E-05	0.055	1.23E-09	1.72E-07	6.13E-11	1.23E-09	1.23E-09	1.23E-09	1.10E-06	1.23E-09
I-110, Anaheim to PCH	5.82E-01	1.75E-04	6.40E-04	4.71E-03	1.16E-04	9.83E-03	2.33E-04	1.16E-04	0.090	2.07E-09	2.90E-07	1.04E-10	2.07E-09	2.07E-09	2.07E-09	1.87E-06	2.07E-09
1-110, PCH to Sepulveda	1.04E+00	3.13E-04	1.15E-03	8.44E-03	2.08E-04	1.76E-02	4.17E-04	2.08E-04	0.162	3.94E-09	5.52E-07	1.97E-10	3.94E-09	3.94E-09	3.94E-09	3.55E-06	3.94E-09
I-110, Sepulveda to Carson	1.11E+00	3.33E-04	1.22E-03	8.98E-03	2.22E-04	1.87E-02	4.43E-04	2.22E-04	0.172	4.63E-09	6.48E-07	2.31E-10	4.63E-09	4.63E-09	4.63E-09	4.17E-06	4.63E-09
I-110, Carson to Del Amo	7.01E-01	2.10E-04	7.71E-04	5.68E-03	1.40E-04	1.18E-02	2.80E-04	1.40E-04	0.109	3.11E-09	4.36E-07	1.56E-10	3.11E-09	3.11E-09	3.11E-09	2.80E-06	3.11E-09
I-110, Del Amo to 405	4.93E-01	1.48E-04	5.42E-04	3.99E-03	9.85E-05	8.33E-03	1.97E-04	9.85E-05	0.077	2.38E-09	3.33E-07	1.19E-10	2.38E-09	2.38E-09	2.38E-09	2.14E-06	2.38E-09
I-110, 405 to SR-91	6.46E-01	1.94E-04	7.11E-04	5.24E-03	1.29E-04	1.09E-02	2.59E-04	1.29E-04	0.100	4.10E-09	5.74E-07	2.05E-10	4.10E-09	4.10E-09	4.10E-09	3.69E-06	4.10E-09
I-710, Anaheim to PCH	7.68E-01	2.30E-04	8.45E-04	6.22E-03	1.54E-04	1.30E-02	3.07E-04	1.54E-04	0.119	2.10E-09	2.93E-07	1.05E-10	2.10E-09	2.10E-09	2.10E-09	1.89E-06	2.10E-09
I-710, PCH to Willow	1.69E+00	5.06E-04	1.86E-03	1.37E-02	3.38E-04	2.85E-02	6.75E-04	3.38E-04	0.262	4.65E-09	6.50E-07	2.32E-10	4.65E-09	4.65E-09	4.65E-09	4.18E-06	4.65E-09
I-710, Willow to 405	2.55E+00	7.64E-04	2.80E-03	2.06E-02	5.09E-04	4.30E-02	1.02E-03	5.09E-04	0.396	7.06E-09	9.88E-07	3.53E-10	7.06E-09	7.06E-09	7.06E-09	6.35E-06	7.06E-09
I-710, 405 to Del Amo	2.22E+00	6.66E-04	2.44E-03	1.80E-02	4.44E-04	3.75E-02	8.88E-04	4.44E-04	0.345	6.78E-09	9.49E-07	3.39E-10	6.78E-09	6.78E-09	6.78E-09	6.10E-06	6.78E-09
I-710, Del Amo to Long Beach Blvd Interchange	1.81E+00	5.43E-04	1.99E-03	1.47E-02	3.62E-04	3.06E-02	7.24E-04	3.62E-04	0.281	5.62E-09	7.87E-07	2.81E-10	5.62E-09	5.62E-09	5.62E-09	5.06E-06	5.62E-09
I-710, Long Beach Boulevard to SR-91	1.47E+00	4.40E-04	1.61E-03	1.19E-02	2.93E-04	2.48E-02	5.87E-04	2.93E-04	0.228	4.97E-09	6.95E-07	2.48E-10	4.97E-09	4.97E-09	4.97E-09	4.47E-06	4.97E-09
PCH, I110 to Alameda	3.08E-01	9.25E-05	3.39E-04	2.50E-03	6.17E-05	5.21E-03	1.23E-04	6.17E-05	0.048	1.26E-09	1.76E-07	6.28E-11	1.26E-09	1.26E-09	1.26E-09	1.13E-06	1.26E-09
PCH, Alameda to SR-103	3.24E-02	9.71E-06	3.56E-05	2.62E-04	6.47E-06	5.47E-04	1.29E-05	6.47E-06	0.005	2.39E-10	3.35E-08	1.20E-11	2.39E-10	2.39E-10	2.39E-10	2.15E-07	2.39E-10
PCH, SR-103 to I-710	3.33E-01	9.98E-05	3.66E-04	2.70E-03	6.65E-05	5.62E-03	1.33E-04	6.65E-05	0.052	8.79E-10	1.23E-07	4.40E-11	8.79E-10	8.79E-10	8.79E-10	7.91E-07	8.79E-10
Sepulveda, I-110 to Avalon	2.49E-02	7.48E-06	2.74E-05	2.02E-04	4.99E-06	4.22E-04	9.98E-06	4.99E-06	0.004	2.36E-10	3.31E-08	1.18E-11	2.36E-10	2.36E-10	2.36E-10	2.13E-07	2.36E-10
Sepulveda, Avalon to Alameda	5.93E-02	1.78E-05	6.52E-05	4.80E-04	1.19E-05	1.00E-03	2.37E-05	1.19E-05	0.009	3.97E-10	5.56E-08	1.99E-11	3.97E-10	3.97E-10	3.97E-10	3.57E-07	3.97E-10
Sepulveda, Alameda to ICTF	6.08E-02	1.82E-05	6.68E-05	4.92E-04	1.22E-05	1.03E-03	2.43E-05	1.22E-05	0.009	1.81E-10	2.53E-08	9.04E-12	1.81E-10	1.81E-10	1.81E-10	1.63E-07	1.81E-10
Sepulveda, ICTF to SR-103	3.69E-02	1.11E-05	4.05E-05	2.99E-04	7.37E-06	6.23E-04	1.47E-05	7.37E-06	0.006	8.92E-11	1.25E-08	4.46E-12	8.92E-11	8.92E-11	8.92E-11	8.03E-08	8.92E-11
Del Amo, I-110 to Wilmington	4.47E-02	1.34E-05	4.91E-05	3.62E-04	8.94E-06	7.55E-04	1.79E-05	8.94E-06	0.007	4.80E-10	6.72E-08	2.40E-11	4.80E-10	4.80E-10	4.80E-10	4.32E-07	4.80E-10
Del Amo, Wilminton to Alameda	4.27E-02	1.28E-05	4.69E-05	3.45E-04	8.53E-06	7.21E-04	1.71E-05	8.53E-06	0.007	3.18E-10	4.45E-08	1.59E-11	3.18E-10	3.18E-10	3.18E-10	2.86E-07	3.18E-10
Del Amo, Alameda to I-710	5.13E-02	1.54E-05	5.64E-05	4.16E-04	1.03E-05	8.67E-04	2.05E-05	1.03E-05	0.008	3.88E-10	5.43E-08	1.94E-11	3.88E-10	3.88E-10	3.88E-10	3.49E-07	3.88E-10
223rd Street, I-110 to Avalon	4.97E-03	1.49E-06	5.46E-06	4.02E-05	9.94E-07	8.40E-05	1.99E-06	9.94E-07	0.001	2.14E-10	2.99E-08	1.07E-11	2.14E-10	2.14E-10	2.14E-10	1.92E-07	2.14E-10
223rd Street, Avalon to Wilmington	1.91E-03	5.74E-07	2.11E-06	1.55E-05	3.83E-07	3.23E-05	7.66E-07	3.83E-07	0.000	1.87E-10	2.61E-08	9.33E-12	1.87E-10	1.87E-10	1.87E-10	1.68E-07	1.87E-10
223rd Street, Wilmington to Alameda	4.48E-02	1.34E-05	4.93E-05	3.63E-04	8.96E-06	7.57E-04	1.79E-05	8.96E-06	0.007	3.12E-10	4.37E-08	1.56E-11	3.12E-10	3.12E-10	3.12E-10	2.81E-07	3.12E-10
W Wardlow from Alameda to I-710	2.17E-02	6.50E-06	2.38E-05	1.75E-04	4.33E-06	3.66E-04	8.66E-06	4.33E-06	0.003	3.02E-10	4.23E-08	1.51E-11	3.02E-10	3.02E-10	3.02E-10	2.72E-07	3.02E-10

Table B-8
2015 Alternative 1
Maximum Hourly Truck Emissions

	Port Trucks - Diesel Exhaust (LNG & Diesel Trucks)												
	TOG	1,3-Butadiene	Acetaldehyde	Benzene	Ethylbenzene	formaldehyde	n-Hexane	Methanol	MEK	Propylene	Sthrene	Toluene	Xylene
		106990	75070	71432	100414	50000	110543	67561	78933	115071	100425	108883	1330207
Alternative 1, 2015	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to Transition													
New Dock Ramps - Cerritos Channel (A1 Line)	1.55E-01	2.95E-04	1.14E-02	3.11E-03	4.73E-04	2.28E-02	2.44E-04	4.66E-05	2.29E-03	4.03E-03	9.00E-05	2.29E-03	1.62E-03
SB Cerritos Channel - Transition (G1 Line)	4.20E-02	7.99E-05	3.09E-03	8.41E-04	1.28E-04	6.19E-03	6.60E-05	1.26E-05	6.21E-04	1.09E-03	2.44E-05	6.19E-04	4.38E-04
NB Cerritos Channel - Transition (E1 Line)	4.85E-02	9.22E-05	3.57E-03	9.71E-04	1.48E-04	7.14E-03	7.61E-05	1.46E-05	7.16E-04	1.26E-03	2.81E-05	7.14E-04	5.05E-04
Mainline Transition to HF Ramps & SR-103													
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	3.15E-02	5.99E-05	2.32E-03	6.31E-04	9.62E-05	4.64E-03	4.95E-05	9.46E-06	4.66E-04	8.19E-04	1.83E-05	4.65E-04	3.28E-04
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	2.74E-02	5.21E-05	2.02E-03	5.49E-04	8.36E-05	4.03E-03	4.31E-05	8.23E-06	4.05E-04	7.12E-04	1.59E-05	4.04E-04	2.85E-04
Henry Ford Ramps	3.45E-02	6.56E-05	2.54E-03	6.91E-04	1.05E-04	5.08E-03	5.42E-05	1.04E-05	5.10E-04	8.96E-04	2.00E-05	5.08E-04	3.59E-04
Henry Ford n/o Ramps to Alameda	1.22E-01	2.32E-04	8.99E-03	2.45E-03	3.73E-04	1.80E-02	1.92E-04	3.67E-05	1.81E-03	3.18E-03	7.09E-05	1.80E-03	1.27E-03
SR-47 Extension, HF Ramps to Alameda													
SB, 103 Split to Dominguex Channel (D1 Line)	1.40E-01	2.66E-04	1.03E-02	2.80E-03	4.27E-04	2.06E-02	2.20E-04	4.20E-05	2.07E-03	3.63E-03	8.11E-05	2.06E-03	1.46E-03
NB, 103 Split to Dominguex Channel (F1 Line)	1.38E-01	2.62E-04	1.01E-02	2.76E-03	4.21E-04	2.03E-02	2.16E-04	4.14E-05	2.04E-03	3.58E-03	8.00E-05	2.03E-03	1.44E-03
Dominguez Channel - Alameda (I1 Line)	3.32E-01	6.30E-04	2.44E-02	6.64E-03	1.01E-03	4.88E-02	5.21E-04	9.95E-05	4.90E-03	8.61E-03	1.92E-04	4.89E-03	3.45E-03
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	2.89E-01	5.49E-04	2.12E-02	5.78E-03	8.81E-04	4.25E-02	4.53E-04	8.66E-05	4.26E-03	7.50E-03	1.67E-04	4.25E-03	3.01E-03
SR-103 Anaheim to PCH	1.81E-01	3.45E-04	1.33E-02	3.63E-03	5.53E-04	2.67E-02	2.85E-04	5.44E-05	2.68E-03	4.71E-03	1.05E-04	2.67E-03	1.89E-03
SR-103 PCH to Sepulveda/Willow	1.45E-01	2.76E-04	1.07E-02	2.91E-03	4.43E-04	2.14E-02	2.28E-04	4.36E-05	2.15E-03	3.77E-03	8.43E-05	2.14E-03	1.51E-03
E and W Harry Bridges, Figueroa to start Alameda	2.31E-01	4.40E-04	1.70E-02	4.63E-03	7.06E-04	3.41E-02	3.63E-04	6.94E-05	3.42E-03	6.01E-03	1.34E-04	3.41E-03	2.41E-03
Alameda beginning (E Harry Bridges) to Anaheim	1.57E-01	2.99E-04	1.16E-02	3.15E-03	4.80E-04	2.32E-02	2.47E-04	4.72E-05	2.33E-03	4.09E-03	9.13E-05	2.32E-03	1.64E-03
Alameda Anaheim to Henry Ford	5.34E-02	1.01E-04	3.92E-03	1.07E-03	1.63E-04	7.85E-03	8.38E-05	1.60E-05	7.88E-04	1.39E-03	3.10E-05	7.86E-04	5.56E-04
Alameda, Henry Ford to PCH	7.07E-02	1.34E-04	5.20E-03	1.41E-03	2.16E-04	1.04E-02	1.11E-04	2.12E-05	1.04E-03	1.84E-03	4.10E-05	1.04E-03	7.36E-04
Alameda PCH to 405	1.62E+00	3.09E-03	1.19E-01	3.25E-02	4.95E-03	2.39E-01	2.55E-03	4.87E-04	2.40E-02	4.22E-02	9.42E-04	2.39E-02	1.69E-02
Alameda 405 to del Amo	7.05E-01	1.34E-03	5.18E-02	1.41E-02	2.15E-03	1.04E-01	1.11E-03	2.11E-04	1.04E-02	1.83E-02	4.09E-04	1.04E-02	7.34E-03
Alameda, del Amo to South Santa Fe Avenue	4.39E-01	8.34E-04	3.23E-02	8.78E-03	1.34E-03	6.46E-02	6.89E-04	1.32E-04	6.48E-03	1.14E-02	2.54E-04	6.46E-03	4.57E-03
Alameda, South Santa Fe Avenue to SR-91	2.49E-01	4.73E-04	1.83E-02	4.98E-03	7.59E-04	3.66E-02	3.91E-04	7.46E-05	3.67E-03	6.46E-03	1.44E-04	3.66E-03	2.59E-03
I-110, "C" Street Interchange to Anaheim	2.35E-01	4.46E-04	1.73E-02	4.70E-03	7.17E-04	3.46E-02	3.69E-04	7.05E-05	3.47E-03	6.10E-03	1.36E-04	3.46E-03	2.45E-03
I-110, Anaheim to PCH	3.85E-01	7.32E-04	2.83E-02	7.71E-03	1.18E-03	5.67E-02	6.05E-04	1.16E-04	5.69E-03	1.00E-02	2.23E-04	5.67E-03	4.01E-03
1-110, PCH to Sepulveda	6.90E-01	1.31E-03	5.08E-02	1.38E-02	2.11E-03	1.02E-01	1.08E-03	2.07E-04	1.02E-02	1.79E-02	4.00E-04	1.02E-02	7.19E-03
I-110, Sepulveda to Carson	7.34E-01	1.39E-03	5.40E-02	1.47E-02	2.24E-03	1.08E-01	1.15E-03	2.20E-04	1.08E-02	1.91E-02	4.26E-04	1.08E-02	7.64E-03
I-110, Carson to Del Amo	4.64E-01	8.82E-04	3.41E-02	9.29E-03	1.42E-03	6.83E-02	7.29E-04	1.39E-04	6.86E-03	1.21E-02	2.69E-04	6.84E-03	4.83E-03
I-110, Del Amo to 405	3.26E-01	6.20E-04	2.40E-02	6.53E-03	9.95E-04	4.80E-02	5.12E-04	9.79E-05	4.82E-03	8.47E-03	1.89E-04	4.81E-03	3.40E-03
I-110, 405 to SR-91	4.28E-01	8.14E-04	3.15E-02	8.57E-03	1.31E-03	6.30E-02	6.72E-04	1.28E-04	6.32E-03	1.11E-02	2.48E-04	6.31E-03	4.46E-03
I-710, Anaheim to PCH	5.67E-01	1.08E-03	4.17E-02	1.13E-02	1.73E-03	8.35E-02	8.90E-04	1.70E-04	8.38E-03	1.47E-02	3.29E-04	8.35E-03	5.90E-03
I-710, PCH to Willow	1.25E+00	2.37E-03	9.17E-02	2.49E-02	3.80E-03	1.83E-01	1.96E-03	3.74E-04	1.84E-02	3.24E-02	7.23E-04	1.84E-02	1.30E-02
I-710, Willow to 405	1.88E+00	3.57E-03	1.38E-01	3.76E-02	5.73E-03	2.77E-01	2.95E-03	5.64E-04	2.78E-02	4.88E-02	1.09E-03	2.77E-02	1.96E-02
I-710, 405 to Del Amo	1.64E+00	3.11E-03	1.21E-01	3.28E-02	5.00E-03	2.41E-01	2.57E-03	4.92E-04	2.42E-02	4.26E-02	9.51E-04	2.41E-02	1.71E-02
I-710, Del Amo to Long Beach Blvd Interchange	1.34E+00	2.54E-03	9.83E-02	2.68E-02	4.08E-03	1.97E-01	2.10E-03	4.01E-04	1.97E-02	3.47E-02	7.75E-04	1.97E-02	1.39E-02
I-710, Long Beach Boulevard to SR-91	1.08E+00	2.06E-03	7.97E-02	2.17E-02	3.30E-03	1.59E-01	1.70E-03	3.25E-04	1.60E-02	2.81E-02	6.28E-04	1.60E-02	1.13E-02
PCH, I110 to Alameda	3.79E-01	7.20E-04	2.79E-02	7.58E-03	1.16E-03	5.58E-02	5.95E-04	1.14E-04	5.60E-03	9.84E-03	2.20E-04	5.58E-03	3.95E-03
PCH, Alameda to SR-103	3.98E-02	7.55E-05	2.92E-03	7.96E-04	1.21E-04	5.85E-03	6.24E-05	1.19E-05	5.87E-04	1.03E-03	2.31E-05	5.86E-04	4.14E-04
PCH, SR-103 to I-710	4.09E-01	7.77E-04	3.01E-02	8.18E-03	1.25E-03	6.02E-02	6.42E-04	1.23E-04	6.04E-03	1.06E-02	2.37E-04	6.02E-03	4.26E-03
Sepulveda, I-110 to Avalon	2.69E-02	5.11E-05	1.98E-03	5.39E-04	8.21E-05	3.96E-03	4.23E-05	8.08E-06	3.98E-04	6.99E-04	1.56E-05	3.97E-04	2.80E-04
Sepulveda, Avalon to Alameda	6.39E-02	1.22E-04	4.70E-03	1.28E-03	1.95E-04	9.41E-03	1.00E-04	1.92E-05	9.45E-04	1.66E-03	3.71E-05	9.42E-04	6.66E-04
Sepulveda, Alameda to ICTF	6.55E-02	1.25E-04	4.82E-03	1.31E-03	2.00E-04	9.65E-03	1.03E-04	1.97E-05	9.68E-04	1.70E-03	3.80E-05	9.66E-04	6.82E-04
Sepulveda, ICTF to SR-103	3.98E-02	7.56E-05	2.92E-03	7.96E-04	1.21E-04	5.85E-03	6.24E-05	1.19E-05	5.87E-04	1.03E-03	2.31E-05	5.86E-04	4.14E-04
Del Amo, I-110 to Wilmington	4.82E-02	9.16E-05	3.54E-03	9.65E-04	1.47E-04	7.09E-03	7.57E-05	1.45E-05	7.12E-04	1.25E-03	2.80E-05	7.10E-04	5.02E-04
Del Amo, Wilminton to Alameda	4.60E-02	8.74E-05	3.38E-03	9.21E-04	1.40E-04	6.77E-03	7.23E-05	1.38E-05	6.80E-04	1.20E-03	2.67E-05	6.78E-04	4.79E-04
Del Amo, Alameda to I-710	5.54E-02	1.05E-04	4.07E-03	1.11E-03	1.69E-04	8.15E-03	8.69E-05	1.66E-05	8.18E-04	1.44E-03	3.21E-05	8.16E-04	5.76E-04
223rd Street, I-110 to Avalon	5.36E-03	1.02E-05	3.94E-04	1.07E-04	1.63E-05	7.89E-04	8.42E-06	1.61E-06	7.92E-05	1.39E-04	3.11E-06	7.90E-05	5.58E-05
223rd Street, Avalon to Wilmington	2.07E-03	3.92E-06	1.52E-04	4.13E-05	6.30E-06	3.04E-04	3.24E-06	6.20E-07	3.05E-05	5.36E-05	1.20E-06	3.04E-05	2.15E-05
223rd Street, Wilmington to Alameda	4.83E-02	9.18E-05	3.55E-03	9.67E-04	1.47E-04	7.11E-03	7.59E-05	1.45E-05	7.14E-04	1.25E-03	2.80E-05	7.12E-04	5.03E-04
W Wardlow from Alameda to I-710	2.34E-02	4.44E-05	1.72E-03	4.68E-04	7.13E-05	3.44E-03	3.67E-05	7.01E-06	3.45E-04	6.07E-04	1.36E-05	3.44E-04	2.43E-04

Table B-8
2015 Alternative 1
Maximum Hourly Truck Emissions

	Port Trucks - Diesel Exhaust (LNG & Diesel Trucks)																	
	DPM	Ammonia	Antimony	Arsenic	Bromine	Bromine	Cadmium	Chlorine	Chromium	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Sulfates	Vanadium	Zinc
		7664417	7440360	7440382	7726956	7726956	7440439	7782505	18540299	7440508	7439921	7439965	7439976	7440020	7782492	9960	7440622	7440666
Alternative 1, 2015	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to Transition																		
New Dock Ramps - Cerritos Channel (A1 Line)	6.65E-02	2.24E-04	2.39E-06	3.33E-07	1.20E-06	1.20E-06	2.66E-06	2.29E-05	3.99E-08	1.66E-06	2.79E-06	2.66E-06	2.00E-06	1.26E-06	6.65E-07	1.16E-03	1.93E-06	2.91E-05
SB Cerritos Channel - Transition (G1 Line)	1.80E-02	6.07E-05	6.49E-07	9.01E-08	3.24E-07	3.24E-07	7.21E-07	6.20E-06	1.08E-08	4.50E-07	7.57E-07	7.21E-07	5.40E-07	3.42E-07	1.80E-07	3.13E-04	5.22E-07	7.89E-06
NB Cerritos Channel - Transition (E1 Line)	2.08E-02	7.00E-05	7.48E-07	1.04E-07	3.74E-07	3.74E-07	8.31E-07	7.15E-06	1.25E-08	5.20E-07	8.73E-07	8.31E-07	6.24E-07	3.95E-07	2.08E-07	3.62E-04	6.03E-07	9.10E-06
Mainline Transition to HF Ramps & SR-103	0.00E+00																	
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	1.35E-02	4.55E-05	4.87E-07	6.76E-08	2.43E-07	2.43E-07	5.41E-07	4.65E-06	8.11E-09	3.38E-07	5.68E-07	5.41E-07	4.05E-07	2.57E-07	1.35E-07	2.35E-04	3.92E-07	5.92E-06
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	1.18E-02	3.96E-05	4.23E-07	5.88E-08	2.12E-07	2.12E-07	4.70E-07	4.04E-06	7.05E-09	2.94E-07	4.94E-07	4.70E-07	3.53E-07	2.23E-07	1.18E-07	2.04E-04	3.41E-07	5.15E-06
Henry Ford Ramps	4.21E-03	1.42E-05	1.52E-07	2.11E-08	7.58E-08	7.58E-08	1.68E-07	1.45E-06	2.53E-09	1.05E-07	1.77E-07	1.68E-07	1.26E-07	8.00E-08	4.21E-08	7.33E-05	1.22E-07	1.84E-06
Henry Ford n/o Ramps to Alameda	1.49E-02	5.03E-05	5.37E-07	7.46E-08	2.69E-07	2.69E-07	5.97E-07	5.13E-06	8.95E-09	3.73E-07	6.27E-07	5.97E-07	4.48E-07	2.83E-07	1.49E-07	2.60E-04	4.33E-07	6.53E-06
SR-47 Extension, HF Ramps to Alameda	0.00E+00																	
SB, 103 Split to Dominguex Channel (D1 Line)	4.90E-02	1.65E-04	1.77E-06	2.45E-07	8.83E-07	8.83E-07	1.96E-06	1.69E-05	2.94E-08	1.23E-06	2.06E-06	1.96E-06	1.47E-06	9.32E-07	4.90E-07	8.53E-04	1.42E-06	2.15E-05
NB, 103 Split to Dominguex Channel (F1 Line)	4.83E-02	1.63E-04	1.74E-06	2.42E-07	8.70E-07	8.70E-07	1.93E-06	1.66E-05	2.90E-08	1.21E-06	2.03E-06	1.93E-06	1.45E-06	9.18E-07	4.83E-07	8.41E-04	1.40E-06	2.12E-05
Dominguez Channel - Alameda (I1 Line)	1.16E-01	3.92E-04	4.19E-06	5.81E-07	2.09E-06	2.09E-06	4.65E-06	4.00E-05	6.98E-08	2.91E-06	4.88E-06	4.65E-06	3.49E-06	2.21E-06	1.16E-06	2.02E-03	3.37E-06	5.09E-05
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	8.13E-02	2.74E-04	2.93E-06	4.06E-07	1.46E-06	1.46E-06	3.25E-06	2.80E-05	4.88E-08	2.03E-06	3.41E-06	3.25E-06	2.44E-06	1.54E-06	8.13E-07	1.41E-03	2.36E-06	3.56E-05
SR-103 Anaheim to PCH	5.11E-02	1.72E-04	1.84E-06	2.55E-07	9.20E-07	9.20E-07	2.04E-06	1.76E-05	3.07E-08	1.28E-06	2.15E-06	2.04E-06	1.53E-06	9.71E-07	5.11E-07	8.89E-04	1.48E-06	2.24E-05
SR-103 PCH to Sepulveda/Willow	4.09E-02	1.38E-04	1.47E-06	2.05E-07	7.36E-07	7.36E-07	1.64E-06	1.41E-05	2.45E-08	1.02E-06	1.72E-06	1.64E-06	1.23E-06	7.77E-07	4.09E-07	7.12E-04	1.19E-06	1.79E-05
E and W Harry Bridges, Figueroa to start Alameda	5.27E-02	1.78E-04	1.90E-06	2.64E-07	9.49E-07	9.49E-07	2.11E-06	1.81E-05	3.16E-08	1.32E-06	2.21E-06	2.11E-06	1.58E-06	1.00E-06	5.27E-07	9.17E-04	1.53E-06	2.31E-05
Alameda beginning (E Harry Bridges) to Anaheim	3.59E-02	1.21E-04	1.29E-06	1.79E-07	6.46E-07	6.46E-07	1.43E-06	1.23E-05	2.15E-08	8.97E-07	1.51E-06	1.43E-06	1.08E-06	6.82E-07	3.59E-07	6.24E-04	1.04E-06	1.57E-05
Alameda Anaheim to Henry Ford	1.22E-02	4.10E-05	4.38E-07	6.08E-08	2.19E-07	2.19E-07	4.86E-07	4.18E-06	7.29E-09	3.04E-07	5.11E-07	4.86E-07	3.65E-07	2.31E-07	1.22E-07	2.12E-04	3.53E-07	5.32E-06
Alameda, Henry Ford to PCH	1.61E-02	5.42E-05	5.80E-07	8.05E-08	2.90E-07	2.90E-07	6.44E-07	5.54E-06	9.66E-09	4.03E-07	6.76E-07	6.44E-07	4.83E-07	3.06E-07	1.61E-07	2.80E-04	4.67E-07	7.05E-06
Alameda PCH to 405	3.01E-01	1.01E-03	1.08E-05	1.50E-06	5.41E-06	5.41E-06	1.20E-05	1.03E-04	1.80E-07	7.51E-06	1.26E-05	1.20E-05	9.02E-06	5.71E-06	3.01E-06	5.23E-03	8.72E-06	1.32E-04
Alameda 405 to del Amo	1.61E-01	5.41E-04	5.78E-06	8.03E-07	2.89E-06	2.89E-06	6.42E-06	5.52E-05	9.63E-08	4.01E-06	6.74E-06	6.42E-06	4.82E-06	3.05E-06	1.61E-06	2.79E-03	4.66E-06	7.03E-05
Alameda, del Amo to South Santa Fe Avenue	9.99E-02	3.37E-04	3.60E-06	5.00E-07	1.80E-06	1.80E-06	4.00E-06	3.44E-05	6.00E-08	2.50E-06	4.20E-06	4.00E-06	3.00E-06	1.90E-06	9.99E-07	1.74E-03	2.90E-06	4.38E-05
Alameda, South Santa Fe Avenue to SR-91	5.67E-02	1.91E-04	2.04E-06	2.83E-07	1.02E-06	1.02E-06	2.27E-06	1.95E-05	3.40E-08	1.42E-06	2.38E-06	2.27E-06	1.70E-06	1.08E-06	5.67E-07	9.86E-04	1.64E-06	2.48E-05
I-110, "C" Street Interchange to Anaheim	6.62E-02	2.23E-04	2.38E-06	3.31E-07	1.19E-06	1.19E-06	2.65E-06	2.28E-05	3.97E-08	1.65E-06	2.78E-06	2.65E-06	1.98E-06	1.26E-06	6.62E-07	1.15E-03	1.92E-06	2.90E-05
I-110, Anaheim to PCH	1.08E-01	3.66E-04	3.91E-06	5.42E-07	1.95E-06	1.95E-06	4.34E-06	3.73E-05	6.51E-08	2.71E-06	4.56E-06	4.34E-06	3.25E-06	2.06E-06	1.08E-06	1.89E-03	3.15E-06	4.75E-05
1-110, PCH to Sepulveda	1.94E-01	6.55E-04	7.00E-06	9.72E-07	3.50E-06	3.50E-06	7.78E-06	6.69E-05	1.17E-07	4.86E-06	8.16E-06	7.78E-06	5.83E-06	3.69E-06	1.94E-06	3.38E-03	5.64E-06	8.51E-05
I-110, Sepulveda to Carson	2.07E-01	6.97E-04	7.44E-06	1.03E-06	3.72E-06	3.72E-06	8.27E-06	7.11E-05	1.24E-07	5.17E-06	8.68E-06	8.27E-06	6.20E-06	3.93E-06	2.07E-06	3.60E-03	6.00E-06	9.06E-05
I-110, Carson to Del Amo	1.31E-01	4.41E-04	4.71E-06	6.54E-07	2.35E-06	2.35E-06	5.23E-06	4.50E-05	7.85E-08	3.27E-06	5.49E-06	5.23E-06	3.92E-06	2.48E-06	1.31E-06	2.28E-03	3.79E-06	5.73E-05
I-110, Del Amo to 405	9.19E-02	3.10E-04	3.31E-06	4.59E-07	1.65E-06	1.65E-06	3.68E-06	3.16E-05	5.51E-08	2.30E-06	3.86E-06	3.68E-06	2.76E-06	1.75E-06	9.19E-07	1.60E-03	2.66E-06	4.03E-05
I-110, 405 to SR-91	1.21E-01	4.06E-04	4.34E-06	6.03E-07	2.17E-06	2.17E-06	4.82E-06	4.15E-05	7.23E-08	3.01E-06	5.06E-06	4.82E-06	3.62E-06	2.29E-06	1.21E-06	2.10E-03	3.50E-06	5.28E-05
I-710, Anaheim to PCH	1.29E-01	4.35E-04	4.65E-06	6.46E-07	2.33E-06	2.33E-06	5.17E-06	4.44E-05	7.75E-08	3.23E-06	5.43E-06	5.17E-06	3.88E-06	2.45E-06	1.29E-06	2.25E-03	3.75E-06	5.66E-05
I-710, PCH to Willow	2.84E-01	9.57E-04	1.02E-05	1.42E-06	5.11E-06	5.11E-06	1.14E-05	9.77E-05	1.70E-07	7.10E-06	1.19E-05	1.14E-05	8.52E-06	5.39E-06	2.84E-06	4.94E-03	8.23E-06	1.24E-04
I-710, Willow to 405	4.28E-01	1.44E-03	1.54E-05	2.14E-06	7.71E-06	7.71E-06	1.71E-05	1.47E-04	2.57E-07	1.07E-05	1.80E-05	1.71E-05	1.28E-05	8.14E-06	4.28E-06	7.45E-03	1.24E-05	1.88E-04
I-710, 405 to Del Amo	3.73E-01	1.26E-03	1.34E-05	1.87E-06	6.72E-06	6.72E-06	1.49E-05	1.28E-04	2.24E-07	9.33E-06	1.57E-05	1.49E-05	1.12E-05	7.09E-06	3.73E-06	6.50E-03	1.08E-05	1.64E-04
I-710, Del Amo to Long Beach Blvd Interchange	3.05E-01	1.03E-03	1.10E-05	1.52E-06	5.48E-06	5.48E-06	1.22E-05	1.05E-04	1.83E-07	7.61E-06	1.28E-05	1.22E-05	9.14E-06	5.79E-06	3.05E-06	5.30E-03	8.83E-06	1.33E-04
I-710, Long Beach Boulevard to SR-91	2.47E-01	8.31E-04	8.88E-06	1.23E-06	4.44E-06	4.44E-06	9.87E-06	8.49E-05	1.48E-07	6.17E-06	1.04E-05	9.87E-06	7.40E-06	4.69E-06	2.47E-06	4.29E-03	7.16E-06	1.08E-04
PCH, I110 to Alameda	4.62E-02	1.56E-04	1.66E-06	2.31E-07	8.32E-07	8.32E-07	1.85E-06	1.59E-05	2.77E-08	1.16E-06	1.94E-06	1.85E-06	1.39E-06	8.79E-07	4.62E-07	8.05E-04	1.34E-06	2.03E-05
PCH, Alameda to SR-103	4.85E-03	1.63E-05	1.75E-07	2.43E-08	8.73E-08	8.73E-08	1.94E-07	1.67E-06	2.91E-09	1.21E-07	2.04E-07	1.94E-07	1.46E-07	9.22E-08	4.85E-08	8.44E-05	1.41E-07	2.12E-06
PCH, SR-103 to I-710	4.99E-02	1.68E-04	1.80E-06	2.49E-07	8.98E-07	8.98E-07	2.00E-06	1.72E-05	2.99E-08	1.25E-06	2.10E-06	2.00E-06	1.50E-06	9.48E-07	4.99E-07	8.68E-04	1.45E-06	2.19E-05
Sepulveda, I-110 to Avalon	3.63E-03	1.22E-05	1.31E-07	1.81E-08	6.53E-08	6.53E-08	1.45E-07	1.25E-06	2.18E-09	9.07E-08	1.52E-07	1.45E-07	1.09E-07	6.89E-08	3.63E-08	6.31E-05	1.05E-07	1.59E-06
Sepulveda, Avalon to Alameda	8.62E-03	2.90E-05	3.10E-07	4.31E-08	1.55E-07	1.55E-07	3.45E-07	2.96E-06	5.17E-09	2.15E-07	3.62E-07	3.45E-07	2.58E-07	1.64E-07	8.62E-08	1.50E-04	2.50E-07	3.77E-06
Sepulveda, Alameda to ICTF	8.83E-03	2.98E-05	3.18E-07	4.42E-08	1.59E-07	1.59E-07	3.53E-07	3.04E-06	5.30E-09	2.21E-07	3.71E-07	3.53E-07	2.65E-07	1.68E-07	8.83E-08	1.54E-04	2.56E-07	3.87E-06
Sepulveda, ICTF to SR-103	5.36E-03	1.80E-05	1.93E-07	2.68E-08	9.64E-08	9.64E-08	2.14E-07	1.84E-06	3.21E-09	1.34E-07	2.25E-07	2.14E-07	1.61E-07	1.02E-07	5.36E-08	9.32E-05	1.55E-07	2.35E-06
Del Amo, I-110 to Wilmington	6.49E-03	2.19E-05	2.34E-07	3.25E-08	1.17E-07	1.17E-07	2.60E-07	2.23E-06	3.90E-09	1.62E-07	2.73E-07	2.60E-07	1.95E-07	1.23E-07	6.49E-08	1.13E-04	1.88E-07	2.84E-06
Del Amo, Wilminton to Alameda	6.20E-03	2.09E-05	2.23E-07	3.10E-08	1.12E-07	1.12E-07	2.48E-07	2.13E-06	3.72E-09	1.55E-07	2.60E-07	2.48E-07	1.86E-07	1.18E-07	6.20E-08	1.08E-04	1.80E-07	2.72E-06
Del Amo, Alameda to I-710	7.46E-03	2.51E-05	2.69E-07	3.73E-08	1.34E-07	1.34E-07	2.98E-07	2.57E-06	4.48E-09	1.86E-07	3.13E-07	2.98E-07	2.24E-07	1.42E-07	7.46E-08	1.30E-04	2.16E-07	3.27E-06
223rd Street, I-110 to Avalon	7.22E-04	2.43E-06	2.60E-08	3.61E-09	1.30E-08	1.30E-08	2.89E-08	2.48E-07	4.33E-10	1.81E-08	3.03E-08	2.89E-08	2.17E-08	1.37E-08	7.22E-09	1.26E-05	2.09E-08	3.16E-07
223rd Street, Avalon to Wilmington	2.78E-04	9.37E-07	1.00E-08	1.39E-09	5.01E-09	5.01E-09	1.11E-08	9.57E-08	1.67E-10	6.96E-09	1.17E-08	1.11E-08	8.35E-09	5.29E-09	2.78E-09	4.84E-06	8.07E-09	1.22E-07
223rd Street, Wilmington to Alameda	6.51E-03	2.19E-05	2.34E-07	3.25E-08	1.17E-07	1.17E-07	2.60E-07	2.24E-06	3.91E-09	1.63E-07	2.73E-07	2.60E-07	1.95E-07	1.24E-07	6.51E-08	1.13E-04	1.89E-07	2.85E-06
W Wardlow from Alameda to I-710	3.15E-03	1.06E-05	1.13E-07	1.57E-08	5.67E-08	5.67E-08	1.26E-07	1.08E-06	1.89E-09	7.87E-08	1.32E-07	1.26E-07	9.44E-08	5.98E-08	3.15E-08	5.48E-05	9.13E-08	1.38E-06

Table B-8
2015 Alternative 1
Maximum Hourly Truck Emissions

	SCAG Gasoline Truck Emissions					
	TOG	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
		71432	50000	106990	75070	107028
Alternative 1, 2015	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to Transition						
New Dock Ramps - Cerritos Channel (A1 Line)	1.30E-03	3.16E-05	2.22E-05	7.17E-06	4.99E-06	1.70E-06
SB Cerritos Channel - Transition (G1 Line)	3.51E-04	8.55E-06	6.01E-06	1.94E-06	1.35E-06	4.60E-07
NB Cerritos Channel - Transition (E1 Line)	4.05E-04	9.87E-06	6.93E-06	2.24E-06	1.56E-06	5.31E-07
Mainline Transition to HF Ramps & SR-103						
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	3.21E-04	7.82E-06	5.50E-06	1.78E-06	1.24E-06	4.21E-07
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	2.79E-04	6.80E-06	4.78E-06	1.55E-06	1.08E-06	3.66E-07
Henry Ford Ramps	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Henry Ford n/o Ramps to Alameda	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SR-47 Extension, HF Ramps to Alameda						
SB, 103 Split to Dominguex Channel (D1 Line)	7.56E-04	1.84E-05	1.29E-05	4.18E-06	2.91E-06	9.91E-07
NB, 103 Split to Dominguex Channel (F1 Line)	7.46E-04	1.82E-05	1.28E-05	4.12E-06	2.87E-06	9.77E-07
Dominguez Channel - Alameda (I1 Line)	1.79E-03	4.37E-05	3.07E-05	9.92E-06	6.91E-06	2.35E-06
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	3.54E-03	8.62E-05	6.05E-05	1.96E-05	1.36E-05	4.64E-06
SR-103 Anaheim to PCH	4.77E-03	1.16E-04	8.15E-05	2.64E-05	1.84E-05	6.25E-06
SR-103 PCH to Sepulveda/Willow	1.42E-02	3.46E-04	2.43E-04	7.87E-05	5.48E-05	1.86E-05
E and W Harry Bridges, Figueroa to start Alameda	6.73E-03	1.64E-04	1.15E-04	3.72E-05	2.59E-05	8.81E-06
Alameda beginning (E Harry Bridges) to Anaheim	8.69E-03	2.11E-04	1.49E-04	4.80E-05	3.34E-05	1.14E-05
Alameda Anaheim to Henry Ford	6.21E-03	1.51E-04	1.06E-04	3.43E-05	2.39E-05	8.13E-06
Alameda, Henry Ford to PCH	5.31E-03	1.29E-04	9.08E-05	2.94E-05	2.04E-05	6.96E-06
Alameda PCH to 405	9.74E-02	2.37E-03	1.67E-03	5.39E-04	3.75E-04	1.28E-04
Alameda 405 to del Amo	8.23E-02	2.00E-03	1.41E-03	4.55E-04	3.17E-04	1.08E-04
Alameda, del Amo to South Santa Fe Avenue	3.92E-02	9.54E-04	6.70E-04	2.17E-04	1.51E-04	5.13E-05
Alameda, South Santa Fe Avenue to SR-91	3.37E-02	8.20E-04	5.76E-04	1.86E-04	1.30E-04	4.41E-05
I-110, "C" Street Interchange to Anaheim	2.97E-02	7.22E-04	5.07E-04	1.64E-04	1.14E-04	3.88E-05
I-110, Anaheim to PCH	5.56E-02	1.35E-03	9.52E-04	3.08E-04	2.14E-04	7.29E-05
1-110, PCH to Sepulveda	1.25E-01	3.05E-03	2.14E-03	6.92E-04	4.82E-04	1.64E-04
I-110, Sepulveda to Carson	1.81E-01	4.42E-03	3.10E-03	1.00E-03	6.98E-04	2.38E-04
I-110, Carson to Del Amo	1.35E-01	3.29E-03	2.31E-03	7.48E-04	5.21E-04	1.77E-04
I-110, Del Amo to 405	1.17E-01	2.84E-03	1.99E-03	6.44E-04	4.49E-04	1.53E-04
I-110, 405 to SR-91	2.61E-01	6.37E-03	4.47E-03	1.45E-03	1.01E-03	3.42E-04
I-710, Anaheim to PCH	3.00E-02	7.31E-04	5.13E-04	1.66E-04	1.16E-04	3.93E-05
I-710, PCH to Willow	7.15E-02	1.74E-03	1.22E-03	3.95E-04	2.75E-04	9.37E-05
I-710, Willow to 405	1.15E-01	2.79E-03	1.96E-03	6.34E-04	4.42E-04	1.50E-04
I-710, 405 to Del Amo	1.85E-01	4.49E-03	3.16E-03	1.02E-03	7.10E-04	2.42E-04
I-710, Del Amo to Long Beach Blvd Interchange	1.63E-01	3.96E-03	2.78E-03	9.00E-04	6.26E-04	2.13E-04
I-710, Long Beach Boulevard to SR-91	1.88E-01	4.57E-03	3.21E-03	1.04E-03	7.22E-04	2.46E-04
PCH, I110 to Alameda	1.80E-01	4.39E-03	3.09E-03	9.98E-04	6.95E-04	2.36E-04
PCH, Alameda to SR-103	5.19E-02	1.26E-03	8.88E-04	2.87E-04	2.00E-04	6.80E-05
PCH, SR-103 to I-710	4.80E-02	1.17E-03	8.21E-04	2.65E-04	1.85E-04	6.29E-05
Sepulveda, I-110 to Avalon	4.58E-02	1.12E-03	7.84E-04	2.54E-04	1.77E-04	6.01E-05
Sepulveda, Avalon to Alameda	6.80E-02	1.65E-03	1.16E-03	3.76E-04	2.62E-04	8.90E-05
Sepulveda, Alameda to ICTF	1.32E-02	3.21E-04	2.25E-04	7.29E-05	5.07E-05	1.73E-05
Sepulveda, ICTF to SR-103	2.87E-03	6.99E-05	4.91E-05	1.59E-05	1.10E-05	3.76E-06
Del Amo, I-110 to Wilmington	9.63E-02	2.35E-03	1.65E-03	5.33E-04	3.71E-04	1.26E-04
Del Amo, Wilminton to Alameda	5.70E-02	1.39E-03	9.74E-04	3.15E-04	2.19E-04	7.46E-05
Del Amo, Alameda to I-710	6.98E-02	1.70E-03	1.19E-03	3.86E-04	2.69E-04	9.14E-05
223rd Street, I-110 to Avalon	5.07E-02	1.23E-03	8.67E-04	2.80E-04	1.95E-04	6.64E-05
223rd Street, Avalon to Wilmington	4.56E-02	1.11E-03	7.80E-04	2.52E-04	1.76E-04	5.97E-05
223rd Street, Wilmington to Alameda	5.43E-02	1.32E-03	9.29E-04	3.00E-04	2.09E-04	7.12E-05
W Wardlow from Alameda to I-710	6.41E-02	1.56E-03	1.10E-03	3.54E-04	2.47E-04	8.40E-05

Table B-8
2015 Alternative 1
Maximum Hourly Truck Emissions

	SCAG Diesel Truck Exhaust												
	TOG	1,3-Butadiene	Acetaldehyde	Benzene	Ethylbenzene	formaldehyde	n-Hexane	Methanol	MEK	Propylene	Sthrene	Toluene	Xylene
		106990	75070	71432	100414	50000	110543	67561	78933	115071	100425	108883	1330207
Alternative 1, 2015	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to Transition													
New Dock Ramps - Cerritos Channel (A1 Line)	2.58E-03	4.91E-06	1.90E-04	5.17E-05	7.88E-06	3.80E-04	4.06E-06	7.75E-07	3.82E-05	6.71E-05	1.50E-06	3.81E-05	2.69E-05
SB Cerritos Channel - Transition (G1 Line)	7.00E-04	1.33E-06	5.15E-05	1.40E-05	2.13E-06	1.03E-04	1.10E-06	2.10E-07	1.03E-05	1.82E-05	4.06E-07	1.03E-05	7.28E-06
NB Cerritos Channel - Transition (E1 Line)	8.07E-04	1.53E-06	5.94E-05	1.62E-05	2.46E-06	1.19E-04	1.27E-06	2.42E-07	1.19E-05	2.10E-05	4.68E-07	1.19E-05	8.41E-06
Mainline Transition to HF Ramps & SR-103													
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	6.40E-04	1.22E-06	4.71E-05	1.28E-05	1.95E-06	9.42E-05	1.01E-06	1.92E-07	9.46E-06	1.66E-05	3.71E-07	9.43E-06	6.67E-06
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	5.57E-04	1.06E-06	4.09E-05	1.11E-05	1.70E-06	8.19E-05	8.74E-07	1.67E-07	8.22E-06	1.45E-05	3.23E-07	8.20E-06	5.80E-06
Henry Ford Ramps	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Henry Ford n/o Ramps to Alameda	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SR-47 Extension, HF Ramps to Alameda													
SB, 103 Split to Dominguex Channel (D1 Line)	1.37E-03	2.61E-06	1.01E-04	2.75E-05	4.19E-06	2.02E-04	2.15E-06	4.12E-07	2.03E-05	3.56E-05	7.96E-07	2.02E-05	1.43E-05
NB, 103 Split to Dominguex Channel (F1 Line)	1.35E-03	2.57E-06	9.95E-05	2.71E-05	4.13E-06	1.99E-04	2.12E-06	4.06E-07	2.00E-05	3.51E-05	7.85E-07	1.99E-05	1.41E-05
Dominguez Channel - Alameda (I1 Line)	3.25E-03	6.18E-06	2.39E-04	6.51E-05	9.93E-06	4.79E-04	5.11E-06	9.76E-07	4.81E-05	8.45E-05	1.89E-06	4.79E-05	3.39E-05
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	6.06E-03	1.15E-05	4.45E-04	1.21E-04	1.85E-05	8.91E-04	9.51E-06	1.82E-06	8.94E-05	1.57E-04	3.51E-06	8.92E-05	6.30E-05
SR-103 Anaheim to PCH	8.16E-03	1.55E-05	6.00E-04	1.63E-04	2.49E-05	1.20E-03	1.28E-05	2.45E-06	1.21E-04	2.12E-04	4.73E-06	1.20E-04	8.49E-05
SR-103 PCH to Sepulveda/Willow	2.43E-02	4.62E-05	1.79E-03	4.87E-04	7.42E-05	3.58E-03	3.82E-05	7.30E-06	3.59E-04	6.32E-04	1.41E-05	3.58E-04	2.53E-04
E and W Harry Bridges, Figueroa to start Alameda	1.10E-02	2.09E-05	8.08E-04	2.20E-04	3.35E-05	1.62E-03	1.73E-05	3.30E-06	1.62E-04	2.85E-04	6.37E-06	1.62E-04	1.14E-04
Alameda beginning (E Harry Bridges) to Anaheim	1.42E-02	2.70E-05	1.04E-03	2.84E-04	4.33E-05	2.09E-03	2.23E-05	4.26E-06	2.10E-04	3.68E-04	8.23E-06	2.09E-04	1.48E-04
Alameda Anaheim to Henry Ford	1.01E-02	1.93E-05	7.46E-04	2.03E-04	3.09E-05	1.49E-03	1.59E-05	3.04E-06	1.50E-04	2.63E-04	5.88E-06	1.49E-04	1.06E-04
Alameda, Henry Ford to PCH	8.67E-03	1.65E-05	6.38E-04	1.74E-04	2.65E-05	1.28E-03	1.36E-05	2.60E-06	1.28E-04	2.25E-04	5.03E-06	1.28E-04	9.03E-05
Alameda PCH to 405	1.54E-01	2.93E-04	1.13E-02	3.08E-03	4.70E-04	2.27E-02	2.42E-04	4.62E-05	2.28E-03	4.00E-03	8.94E-05	2.27E-03	1.60E-03
Alameda 405 to del Amo	1.34E-01	2.55E-04	9.89E-03	2.69E-03	4.10E-04	1.98E-02	2.11E-04	4.03E-05	1.99E-03	3.49E-03	7.80E-05	1.98E-03	1.40E-03
Alameda, del Amo to South Santa Fe Avenue	6.40E-02	1.22E-04	4.71E-03	1.28E-03	1.95E-04	9.42E-03	1.00E-04	1.92E-05	9.45E-04	1.66E-03	3.71E-05	9.43E-04	6.66E-04
Alameda, South Santa Fe Avenue to SR-91	5.50E-02	1.04E-04	4.04E-03	1.10E-03	1.68E-04	8.09E-03	8.63E-05	1.65E-05	8.12E-04	1.43E-03	3.19E-05	8.10E-04	5.72E-04
I-110, "C" Street Interchange to Anaheim	5.07E-02	9.64E-05	3.73E-03	1.02E-03	1.55E-04	7.46E-03	7.96E-05	1.52E-05	7.49E-04	1.32E-03	2.94E-05	7.47E-04	5.28E-04
I-110, Anaheim to PCH	9.52E-02	1.81E-04	7.00E-03	1.91E-03	2.90E-04	1.40E-02	1.49E-04	2.86E-05	1.41E-03	2.47E-03	5.52E-05	1.40E-03	9.91E-04
1-110, PCH to Sepulveda	2.14E-01	4.07E-04	1.57E-02	4.29E-03	6.53E-04	3.15E-02	3.36E-04	6.43E-05	3.16E-03	5.56E-03	1.24E-04	3.16E-03	2.23E-03
I-110, Sepulveda to Carson	3.10E-01	5.90E-04	2.28E-02	6.21E-03	9.47E-04	4.57E-02	4.87E-04	9.31E-05	4.58E-03	8.06E-03	1.80E-04	4.57E-03	3.23E-03
I-110, Carson to Del Amo	2.31E-01	4.40E-04	1.70E-02	4.63E-03	7.06E-04	3.40E-02	3.63E-04	6.94E-05	3.42E-03	6.01E-03	1.34E-04	3.41E-03	2.41E-03
I-110, Del Amo to 405	1.99E-01	3.79E-04	1.47E-02	3.99E-03	6.08E-04	2.93E-02	3.13E-04	5.98E-05	2.94E-03	5.18E-03	1.16E-04	2.94E-03	2.08E-03
I-110, 405 to SR-91	4.47E-01	8.50E-04	3.29E-02	8.95E-03	1.36E-03	6.58E-02	7.02E-04	1.34E-04	6.61E-03	1.16E-02	2.59E-04	6.59E-03	4.66E-03
I-710, Anaheim to PCH	4.90E-02	9.32E-05	3.60E-03	9.81E-04	1.50E-04	7.21E-03	7.70E-05	1.47E-05	7.24E-04	1.27E-03	2.84E-05	7.22E-04	5.10E-04
I-710, PCH to Willow	1.17E-01	2.22E-04	8.59E-03	2.34E-03	3.56E-04	1.72E-02	1.83E-04	3.50E-05	1.73E-03	3.03E-03	6.78E-05	1.72E-03	1.22E-03
I-710, Willow to 405	1.87E-01	3.56E-04	1.38E-02	3.75E-03	5.71E-04	2.76E-02	2.94E-04	5.62E-05	2.77E-03	4.87E-03	1.09E-04	2.76E-03	1.95E-03
I-710, 405 to Del Amo	3.01E-01	5.73E-04	2.22E-02	6.03E-03	9.19E-04	4.44E-02	4.73E-04	9.04E-05	4.45E-03	7.83E-03	1.75E-04	4.44E-03	3.14E-03
I-710, Del Amo to Long Beach Blvd Interchange	2.66E-01	5.05E-04	1.95E-02	5.32E-03	8.11E-04	3.91E-02	4.17E-04	7.97E-05	3.93E-03	6.90E-03	1.54E-04	3.91E-03	2.77E-03
I-710, Long Beach Boulevard to SR-91	3.06E-01	5.82E-04	2.25E-02	6.13E-03	9.35E-04	4.51E-02	4.81E-04	9.19E-05	4.53E-03	7.96E-03	1.78E-04	4.51E-03	3.19E-03
PCH, I110 to Alameda	2.29E-01	4.35E-04	1.68E-02	4.58E-03	6.98E-04	3.37E-02	3.59E-04	6.87E-05	3.38E-03	5.94E-03	1.33E-04	3.37E-03	2.38E-03
PCH, Alameda to SR-103	6.59E-02	1.25E-04	4.84E-03	1.32E-03	2.01E-04	9.69E-03	1.03E-04	1.98E-05	9.73E-04	1.71E-03	3.82E-05	9.70E-04	6.86E-04
PCH, SR-103 to I-710	6.09E-02	1.16E-04	4.48E-03	1.22E-03	1.86E-04	8.96E-03	9.56E-05	1.83E-05	8.99E-04	1.58E-03	3.53E-05	8.97E-04	6.34E-04
Sepulveda, I-110 to Avalon	6.47E-02	1.23E-04	4.76E-03	1.29E-03	1.97E-04	9.52E-03	1.02E-04	1.94E-05	9.55E-04	1.68E-03	3.75E-05	9.53E-04	6.73E-04
Sepulveda, Avalon to Alameda	9.59E-02	1.82E-04	7.05E-03	1.92E-03	2.92E-04	1.41E-02	1.51E-04	2.88E-05	1.42E-03	2.49E-03	5.56E-05	1.41E-03	9.98E-04
Sepulveda, Alameda to ICTF	1.86E-02	3.53E-05	1.37E-03	3.72E-04	5.67E-05	2.74E-03	2.92E-05	5.58E-06	2.75E-04	4.83E-04	1.08E-05	2.74E-04	1.93E-04
Sepulveda, ICTF to SR-103	4.05E-03	7.69E-06	2.98E-04	8.10E-05	1.23E-05	5.96E-04	6.36E-06	1.21E-06	5.98E-05	1.05E-04	2.35E-06	5.96E-05	4.21E-05
Del Amo, I-110 to Wilmington	1.36E-01	2.58E-04	9.99E-03	2.72E-03	4.15E-04	2.00E-02	2.13E-04	4.08E-05	2.01E-03	3.53E-03	7.88E-05	2.00E-03	1.41E-03
Del Amo, Wilminton to Alameda	8.04E-02	1.53E-04	5.91E-03	1.61E-03	2.45E-04	1.18E-02	1.26E-04	2.41E-05	1.19E-03	2.09E-03	4.66E-05	1.18E-03	8.37E-04
Del Amo, Alameda to I-710	9.84E-02	1.87E-04	7.24E-03	1.97E-03	3.00E-04	1.45E-02	1.55E-04	2.95E-05	1.45E-03	2.56E-03	5.71E-05	1.45E-03	1.02E-03
223rd Street, I-110 to Avalon	7.16E-02	1.36E-04	5.26E-03	1.43E-03	2.18E-04	1.05E-02	1.12E-04	2.15E-05	1.06E-03	1.86E-03	4.15E-05	1.05E-03	7.45E-04
223rd Street, Avalon to Wilmington	6.43E-02	1.22E-04	4.73E-03	1.29E-03	1.96E-04	9.47E-03	1.01E-04	1.93E-05	9.50E-04	1.67E-03	3.73E-05	9.48E-04	6.70E-04
223rd Street, Wilmington to Alameda	7.66E-02	1.46E-04	5.63E-03	1.53E-03	2.34E-04	1.13E-02	1.20E-04	2.30E-05	1.13E-03	1.99E-03	4.44E-05	1.13E-03	7.98E-04
W Wardlow from Alameda to I-710	9.04E-02	1.72E-04	6.65E-03	1.81E-03	2.76E-04	1.33E-02	1.42E-04	2.71E-05	1.34E-03	2.35E-03	5.24E-05	1.33E-03	9.41E-04

Table B-8
2015 Alternative 1
Maximum Hourly Truck Emissions

	SCAG Diesel Truck Exhaust Emissions																	
	DPM	Ammonia	Antimony	Arsenic	Bromine	Bromine	Cadmium	Chlorine	Chromium (hex)	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Sulfates	Vanadium	Zinc
		7664417	7440360	7440382	7726956	7726956	7440439	7782505	18540299	7440508	7439921	7439965	7439976	7440020	7782492	9960	7440622	7440666
Alternative 1, 2015	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to Transition																		
New Dock Ramps - Cerritos Channel (A1 Line)	1.12E-03	3.76E-06	4.02E-08	5.59E-09	2.01E-08	2.01E-08	4.47E-08	3.84E-07	6.70E-10	2.79E-08	4.69E-08	4.47E-08	3.35E-08	2.12E-08	1.12E-08	1.94E-05	3.24E-08	4.89E-07
SB Cerritos Channel - Transition (G1 Line)	3.03E-04	1.02E-06	1.09E-08	1.51E-09	5.45E-09	5.45E-09	1.21E-08	1.04E-07	1.82E-10	7.57E-09	1.27E-08	1.21E-08	9.08E-09	5.75E-09	3.03E-09	5.27E-06	8.78E-09	1.33E-07
NB Cerritos Channel - Transition (E1 Line)	3.49E-04	1.18E-06	1.26E-08	1.75E-09	6.28E-09	6.28E-09	1.40E-08	1.20E-07	2.09E-10	8.73E-09	1.47E-08	1.40E-08	1.05E-08	6.63E-09	3.49E-09	6.08E-06	1.01E-08	1.53E-07
Mainline Transition to HF Ramps & SR-103																		
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	2.77E-04	9.33E-07	9.97E-09	1.38E-09	4.98E-09	4.98E-09	1.11E-08	9.53E-08	1.66E-10	6.92E-09	1.16E-08	1.11E-08	8.31E-09	5.26E-09	2.77E-09	4.82E-06	8.03E-09	1.21E-07
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	2.41E-04	8.11E-07	8.67E-09	1.20E-09	4.33E-09	4.33E-09	9.63E-09	8.28E-08	1.44E-10	6.02E-09	1.01E-08	9.63E-09	7.22E-09	4.58E-09	2.41E-09	4.19E-06	6.98E-09	1.05E-07
Henry Ford Ramps	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Henry Ford n/o Ramps to Alameda	0.00E+00																	
SR-47 Extension, HF Ramps to Alameda																		
SB, 103 Split to Dominguex Channel (D1 Line)	5.58E-04	1.88E-06	2.01E-08	2.79E-09	1.00E-08	1.00E-08	2.23E-08	1.92E-07	3.35E-10	1.39E-08	2.34E-08	2.23E-08	1.67E-08	1.06E-08	5.58E-09	9.70E-06	1.62E-08	2.44E-07
NB, 103 Split to Dominguex Channel (F1 Line)	5.50E-04	1.85E-06	1.98E-08	2.75E-09	9.90E-09	9.90E-09	2.20E-08	1.89E-07	3.30E-10	1.37E-08	2.31E-08	2.20E-08	1.65E-08	1.04E-08	5.50E-09	9.57E-06	1.59E-08	2.41E-07
Dominguez Channel - Alameda (I1 Line)	1.32E-03	4.46E-06	4.76E-08	6.61E-09	2.38E-08	2.38E-08	5.29E-08	4.55E-07	7.94E-10	3.31E-08	5.55E-08	5.29E-08	3.97E-08	2.51E-08	1.32E-08	2.30E-05	3.84E-08	5.79E-07
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	2.19E-03	7.39E-06	7.90E-08	1.10E-08	3.95E-08	3.95E-08	8.77E-08	7.55E-07	1.32E-09	5.48E-08	9.21E-08	8.77E-08	6.58E-08	4.17E-08	2.19E-08	3.82E-05	6.36E-08	9.61E-07
SR-103 Anaheim to PCH	2.96E-03	9.96E-06	1.06E-07	1.48E-08	5.32E-08	5.32E-08	1.18E-07	1.02E-06	1.77E-09	7.39E-08	1.24E-07	1.18E-07	8.87E-08	5.61E-08	2.96E-08	5.14E-05	8.57E-08	1.29E-06
SR-103 PCH to Sepulveda/Willow	8.81E-03	2.97E-05	3.17E-07	4.41E-08	1.59E-07	1.59E-07	3.53E-07	3.03E-06	5.29E-09	2.20E-07	3.70E-07	3.53E-07	2.64E-07	1.67E-07	8.81E-08	1.53E-04	2.56E-07	3.86E-06
E and W Harry Bridges, Figueroa to start Alameda	3.43E-03	1.16E-05	1.24E-07	1.72E-08	6.18E-08	6.18E-08	1.37E-07	1.18E-06	2.06E-09	8.58E-08	1.44E-07	1.37E-07	1.03E-07	6.52E-08	3.43E-08	5.97E-05	9.95E-08	1.50E-06
Alameda beginning (E Harry Bridges) to Anaheim	4.43E-03	1.49E-05	1.60E-07	2.22E-08	7.98E-08	7.98E-08	1.77E-07	1.52E-06	2.66E-09	1.11E-07	1.86E-07	1.77E-07	1.33E-07	8.42E-08	4.43E-08	7.71E-05	1.28E-07	1.94E-06
Alameda Anaheim to Henry Ford	3.17E-03	1.07E-05	1.14E-07	1.58E-08	5.70E-08	5.70E-08	1.27E-07	1.09E-06	1.90E-09	7.92E-08	1.33E-07	1.27E-07	9.50E-08	6.02E-08	3.17E-08	5.51E-05	9.18E-08	1.39E-06
Alameda, Henry Ford to PCH	2.71E-03	9.12E-06	9.75E-08	1.35E-08	4.88E-08	4.88E-08	1.08E-07	9.32E-07	1.63E-09	6.77E-08	1.14E-07	1.08E-07	8.13E-08	5.15E-08	2.71E-08	4.71E-05	7.85E-08	1.19E-06
Alameda PCH to 405	4.07E-02	1.37E-04	1.46E-06	2.03E-07	7.32E-07	7.32E-07	1.63E-06	1.40E-05	2.44E-08	1.02E-06	1.71E-06	1.63E-06	1.22E-06	7.72E-07	4.07E-07	7.07E-04	1.18E-06	1.78E-05
Alameda 405 to del Amo	4.20E-02	1.41E-04	1.51E-06	2.10E-07	7.56E-07	7.56E-07	1.68E-06	1.44E-05	2.52E-08	1.05E-06	1.76E-06	1.68E-06	1.26E-06	7.98E-07	4.20E-07	7.31E-04	1.22E-06	1.84E-05
Alameda, del Amo to South Santa Fe Avenue	2.00E-02	6.73E-05	7.19E-07	9.99E-08	3.60E-07	3.60E-07	7.99E-07	6.87E-06	1.20E-08	5.00E-07	8.39E-07	7.99E-07	6.00E-07	3.80E-07	2.00E-07	3.48E-04	5.80E-07	8.75E-06
Alameda, South Santa Fe Avenue to SR-91	1.72E-02	5.78E-05	6.18E-07	8.59E-08	3.09E-07	3.09E-07	6.87E-07	5.91E-06	1.03E-08	4.29E-07	7.21E-07	6.87E-07	5.15E-07	3.26E-07	1.72E-07	2.99E-04	4.98E-07	7.52E-06
I-110, "C" Street Interchange to Anaheim	1.84E-02	6.19E-05	6.61E-07	9.19E-08	3.31E-07	3.31E-07	7.35E-07	6.32E-06	1.10E-08	4.59E-07	7.72E-07	7.35E-07	5.51E-07	3.49E-07	1.84E-07	3.20E-04	5.33E-07	8.05E-06
I-110, Anaheim to PCH	3.45E-02	1.16E-04	1.24E-06	1.72E-07	6.21E-07	6.21E-07	1.38E-06	1.19E-05	2.07E-08	8.62E-07	1.45E-06	1.38E-06	1.03E-06	6.55E-07	3.45E-07	6.00E-04	1.00E-06	1.51E-05
1-110, PCH to Sepulveda	7.76E-02	2.61E-04	2.79E-06	3.88E-07	1.40E-06	1.40E-06	3.10E-06	2.67E-05	4.65E-08	1.94E-06	3.26E-06	3.10E-06	2.33E-06	1.47E-06	7.76E-07	1.35E-03	2.25E-06	3.40E-05
I-110, Sepulveda to Carson	1.12E-01	3.79E-04	4.05E-06	5.62E-07	2.02E-06	2.02E-06	4.50E-06	3.87E-05	6.74E-08	2.81E-06	4.72E-06	4.50E-06	3.37E-06	2.14E-06	1.12E-06	1.96E-03	3.26E-06	4.92E-05
I-110, Carson to Del Amo	8.38E-02	2.82E-04	3.02E-06	4.19E-07	1.51E-06	1.51E-06	3.35E-06	2.88E-05	5.03E-08	2.09E-06	3.52E-06	3.35E-06	2.51E-06	1.59E-06	8.38E-07	1.46E-03	2.43E-06	3.67E-05
I-110, Del Amo to 405	7.22E-02	2.43E-04	2.60E-06	3.61E-07	1.30E-06	1.30E-06	2.89E-06	2.48E-05	4.33E-08	1.81E-06	3.03E-06	2.89E-06	2.17E-06	1.37E-06	7.22E-07	1.26E-03	2.09E-06	3.16E-05
I-110, 405 to SR-91	1.62E-01	5.46E-04	5.83E-06	8.10E-07	2.92E-06	2.92E-06	6.48E-06	5.57E-05	9.72E-08	4.05E-06	6.80E-06	6.48E-06	4.86E-06	3.08E-06	1.62E-06	2.82E-03	4.70E-06	7.10E-05
I-710, Anaheim to PCH	1.53E-02	5.16E-05	5.51E-07	7.66E-08	2.76E-07	2.76E-07	6.12E-07	5.27E-06	9.19E-09	3.83E-07	6.43E-07	6.12E-07	4.59E-07	2.91E-07	1.53E-07	2.66E-04	4.44E-07	6.71E-06
I-710, PCH to Willow	3.65E-02	1.23E-04	1.31E-06	1.82E-07	6.57E-07	6.57E-07	1.46E-06	1.25E-05	2.19E-08	9.12E-07	1.53E-06	1.46E-06	1.09E-06	6.93E-07	3.65E-07	6.35E-04	1.06E-06	1.60E-05
I-710, Willow to 405	5.85E-02	1.97E-04	2.11E-06	2.93E-07	1.05E-06	1.05E-06	2.34E-06	2.01E-05	3.51E-08	1.46E-06	2.46E-06	2.34E-06	1.76E-06	1.11E-06	5.85E-07	1.02E-03	1.70E-06	2.56E-05
I-710, 405 to Del Amo	9.41E-02	3.17E-04	3.39E-06	4.71E-07	1.69E-06	1.69E-06	3.77E-06	3.24E-05	5.65E-08	2.35E-06	3.95E-06	3.77E-06	2.82E-06	1.79E-06	9.41E-07	1.64E-03	2.73E-06	4.12E-05
I-710, Del Amo to Long Beach Blvd Interchange	8.30E-02	2.80E-04	2.99E-06	4.15E-07	1.49E-06	1.49E-06	3.32E-06	2.86E-05	4.98E-08	2.07E-06	3.49E-06	3.32E-06	2.49E-06	1.58E-06	8.30E-07	1.44E-03	2.41E-06	3.64E-05
I-710, Long Beach Boulevard to SR-91	9.57E-02	3.22E-04	3.45E-06	4.79E-07	1.72E-06	1.72E-06	3.83E-06	3.29E-05	5.74E-08	2.39E-06	4.02E-06	3.83E-06	2.87E-06	1.82E-06	9.57E-07	1.67E-03	2.78E-06	4.19E-05
PCH, I110 to Alameda	4.04E-02	1.36E-04	1.46E-06	2.02E-07	7.28E-07	7.28E-07	1.62E-06	1.39E-05	2.43E-08	1.01E-06	1.70E-06	1.62E-06	1.21E-06	7.68E-07	4.04E-07	7.04E-04	1.17E-06	1.77E-05
PCH, Alameda to SR-103	1.16E-02	3.92E-05	4.19E-07	5.82E-08	2.09E-07	2.09E-07	4.66E-07	4.00E-06	6.98E-09	2.91E-07	4.89E-07	4.66E-07	3.49E-07	2.21E-07	1.16E-07	2.03E-04	3.38E-07	5.10E-06
PCH, SR-103 to I-710	1.08E-02	3.62E-05	3.87E-07	5.38E-08	1.94E-07	1.94E-07	4.30E-07	3.70E-06	6.45E-09	2.69E-07	4.52E-07	4.30E-07	3.23E-07	2.04E-07	1.08E-07	1.87E-04	3.12E-07	4.71E-06
Sepulveda, I-110 to Avalon	1.27E-02	4.27E-05	4.56E-07	6.33E-08	2.28E-07	2.28E-07	5.06E-07	4.36E-06	7.60E-09	3.17E-07	5.32E-07	5.06E-07	3.80E-07	2.41E-07	1.27E-07	2.20E-04	3.67E-07	5.55E-06
Sepulveda, Avalon to Alameda	1.88E-02	6.32E-05	6.76E-07	9.38E-08	3.38E-07	3.38E-07	7.51E-07	6.46E-06	1.13E-08	4.69E-07	7.88E-07	7.51E-07	5.63E-07	3.57E-07	1.88E-07	3.27E-04	5.44E-07	8.22E-06
Sepulveda, Alameda to ICTF	3.64E-03	1.23E-05	1.31E-07	1.82E-08	6.55E-08	6.55E-08	1.46E-07	1.25E-06	2.18E-09	9.10E-08	1.53E-07	1.46E-07	1.09E-07	6.91E-08	3.64E-08	6.33E-05	1.06E-07	1.59E-06
Sepulveda, ICTF to SR-103	7.92E-04	2.67E-06	2.85E-08	3.96E-09	1.43E-08	1.43E-08	3.17E-08	2.73E-07	4.75E-10	1.98E-08	3.33E-08	3.17E-08	2.38E-08	1.51E-08	7.92E-09	1.38E-05	2.30E-08	3.47E-07
Del Amo, I-110 to Wilmington	2.66E-02	8.96E-05	9.58E-07	1.33E-07	4.79E-07	4.79E-07	1.06E-06	9.15E-06	1.60E-08	6.65E-07	1.12E-06	1.06E-06	7.98E-07	5.05E-07	2.66E-07	4.63E-04	7.71E-07	1.17E-05
Del Amo, Wilminton to Alameda	1.57E-02	5.30E-05	5.66E-07	7.87E-08	2.83E-07	2.83E-07	6.29E-07	5.41E-06	9.44E-09	3.93E-07	6.61E-07	6.29E-07	4.72E-07	2.99E-07	1.57E-07	2.74E-04	4.56E-07	6.89E-06
Del Amo, Alameda to I-710	1.93E-02	6.49E-05	6.94E-07	9.63E-08	3.47E-07	3.47E-07	7.71E-07	6.63E-06	1.16E-08	4.82E-07	8.09E-07	7.71E-07	5.78E-07	3.66E-07	1.93E-07	3.35E-04	5.59E-07	8.44E-06
223rd Street, I-110 to Avalon	1.40E-02	4.72E-05	5.04E-07	7.00E-08	2.52E-07	2.52E-07	5.60E-07	4.82E-06	8.40E-09	3.50E-07	5.88E-07	5.60E-07	4.20E-07	2.66E-07	1.40E-07	2.44E-04	4.06E-07	6.13E-06
223rd Street, Avalon to Wilmington	1.26E-02	4.24E-05	4.53E-07	6.30E-08	2.27E-07	2.27E-07	5.04E-07	4.33E-06	7.56E-09	3.15E-07	5.29E-07	5.04E-07	3.78E-07	2.39E-07	1.26E-07	2.19E-04	3.65E-07	5.52E-06
223rd Street, Wilmington to Alameda	1.50E-02	5.05E-05	5.40E-07	7.50E-08	2.70E-07	2.70E-07	6.00E-07	5.16E-06	9.00E-09	3.75E-07	6.30E-07	6.00E-07	4.50E-07	2.85E-07	1.50E-07	2.61E-04	4.35E-07	6.57E-06
W Wardlow from Alameda to I-710	1.77E-02	5.96E-05	6.37E-07	8.85E-08	3.19E-07	3.19E-07	7.08E-07	6.09E-06	1.06E-08	4.42E-07	7.43E-07	7.08E-07	5.31E-07	3.36E-07	1.77E-07	3.08E-04	5.13E-07	7.75E-06

Table B-9
2015 Alternative 2
Maximum Hourly Truck Emissions

	Length	Cong Speed	Port Peak Hour trucks	SCAG Peak Hour trucks	Port Peak hr LNG trucks	Port Peak hr Dsl trucks	SCAG Peak hr Gas trucks	SCAG Peak hr Dsl trucks
2015, Alternative 2	mile	mph	veh/hr	veh/hr	veh/hr	veh/hr	veh/hr	veh/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	0.65	55	2281	18	912.4	1368.6	9.414	8.586
Henry Ford Ramps	0.24	20	287	0	114.8	172.2	0	0
Henry Ford n/o Ramps to Alameda	0.68	20	386	0	154.4	231.6	0	0
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.04	50	1993	17	797.2	1195.8	8.891	8.109
SR-103 Anaheim to PCH	0.57	50	2232	44	892.8	1339.2	23.012	20.988
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	0.47	50	1878	71	751.2	1126.8	37.133	33.867
SR-103 Ramps south of Sepulveda/Willow	0	50	333	42	133.2	199.8		
NB Sepulveda Ramp (G2 Line)	0.36	50	199.8	25.2	79.92	119.88	13.1796	12.0204
SB Sepulveda Ramp (F2 Ramp)	0.38	50	133.2	16.8	53.28	79.92	8.7864	8.0136
SR-103 Existing, End Ramps to Sepulveda/Willow		50						
SB Sepulveda Ramp Traffic	0.07	50	133.2	16.8	53.28	79.92	8.7864	8.0136
SB+NB Sepulveda Ramp Traffic	0.11	50	333	42	133.2	199.8	21.966	20.034
SR-103, Realignment to End (223rd/Wardlow)	1.85	50	1544	28	617.6	926.4	14.644	13.356
E and W Harry Bridges, Figueroa to start Alameda	1.44	30	493	13	197.2	295.8	6.799	6.201
Alameda beginning (E Harry Bridges) to Anaheim	0.77	30	554	47	221.6	332.4	24.581	22.419
Alameda Anaheim to Henry Ford	0.42	30	381	55	152.4	228.6	28.765	26.235
Alameda, Henry Ford to PCH	0.34	30	689	56	275.6	413.4	29.288	26.712
Alameda PCH to 405	2.27	40	598	184	239.2	358.8	96.232	87.768
Alameda 405 to del Amo	1.72	40	1186	212	474.4	711.6	110.876	101.124
Alameda, del Amo to South Santa Fe Avenue	0.84	40	1503	183	601.2	901.8	95.709	87.291
Alameda, South Santa Fe Avenue to SR-91	1.15	40	725	125	290	435	65.375	59.625
I-110, "C" Street Interchange to Anaheim	0.49	45	836	256	334.4	501.6	133.888	122.112
I-110, Anaheim to PCH	0.80	45	1365	330	546	819	172.59	157.41
1-110, PCH to Sepulveda	1.39	45	1377	416	550.8	826.2	217.568	198.432
I-110, Sepulveda to Carson	1.56	45	1296	527	518.4	777.6	275.621	251.379
I-110, Carson to Del Amo	1.02	45	1240	609	496	744	318.507	290.493
I-110, Del Amo to 405	0.74	45	1202	718	480.8	721.2	375.514	342.486
I-110, 405 to SR-91	1.09	45	1059	1095	423.6	635.4	572.685	522.315
I-710, Anaheim to PCH	0.50	40	2808	258	1123.2	1684.8	134.934	123.066
I-710, PCH to Willow	1.01	40	2978	295	1191.2	1786.8	154.285	140.715
I-710, Willow to 405	1.52	40	2965	309	1186	1779	161.607	147.393
I-710, 405 to Del Amo	1.42	40	2893	498	1157.2	1735.8	260.454	237.546
I-710, Del Amo to Long Beach Blvd Interchange	1.17	40	2834	542	1133.6	1700.4	283.466	258.534
I-710, Long Beach Boulevard to SR-91	0.96	40	2823	779	1129.2	1693.8	407.417	371.583
PCH, I-110 to Alameda	2.38	20	182	140	72.8	109.2	73.22	66.78
PCH, Alameda to SR-103	0.94	20	42	66	16.8	25.2	34.518	31.482
PCH, SR-103 to I-710	0.98	20	530	83	212	318	43.409	39.591
Sepulveda, I-110 to Avalon	1.37	25	34	69	13.6	20.4	36.087	32.913
Sepulveda, Avalon to Alameda	1.70	25	33	76	13.2	19.8	39.748	36.252
Sepulveda, Alameda to ICTF	0.67	25	103	44	41.2	61.8	23.012	20.988
Sepulveda, ICTF to SR-103	0.17	25	333	37	133.2	199.8	19.351	17.649
Del Amo, I-110 to Wilmington	2.96	25	20	93	8	12	48.639	44.361
Del Amo, Wilminton to Alameda	0.77	25	104	162	41.6	62.4	84.726	77.274
Del Amo, Alameda to I-710	0.87	25	69	125	27.6	41.4	65.375	59.625
223rd Street, I-110 to Avalon	1.36	25	12	79	4.8	7.2	41.317	37.683
223rd Street, Avalon to Wilmington	1.23	25	19	71	7.6	11.4	37.133	33.867
223rd Street, Wilmington to Alameda	0.79	25	188	128	75.2	112.8	66.944	61.056
W Wardlow from Alameda to I-710	1.30	25	73	135	29.2	43.8	70.605	64.395

Table B-9
2015 Alternative 2
Maximum Hourly Truck Emissions

	Port - LNG Trucks				Port - Diesel Trucks		SCAG	SCAG - Diesel Trucks	
	LNG Exhst TOG	LNG Exhst Dsl TOG	LNG Exhst PM	LNG Exhst DPM	Dsl Exhst TOG	Dsl Exhst PM	Gasoline Trucks TOG	Dsl Exhst TOG	Dsl Exhst PM
2015, Alternative 2	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi
SR-47 Mainline, New Dock Ramps to HF Ramps	0.5904	0.0311	0.0918	0.0048	0.201	0.092	0.162	0.353	0.153
Henry Ford Ramps	0.5904	0.0311	0.0918	0.0048	0.463	0.056	0.544	0.756	0.134
Henry Ford n/o Ramps to Alameda	0.5904	0.0311	0.0918	0.0048	0.463	0.056	0.544	0.756	0.134
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	0.5904	0.0311	0.0918	0.0048	0.217	0.080	0.170	0.339	0.138
SR-103 Anaheim to PCH	0.5904	0.0311	0.0918	0.0048	0.217	0.080	0.170	0.339	0.138
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	0.5904	0.0311	0.0918	0.0048	0.217	0.080	0.170	0.339	0.138
SR-103 Ramps south of Sepulveda/Willow									
NB Sepulveda Ramp (G2 Line)	0.5904	0.0311	0.0918	0.0048	0.217	0.080	0.170	0.339	0.138
SB Sepulveda Ramp (F2 Ramp)	0.5904	0.0311	0.0918	0.0048	0.217	0.080	0.170	0.339	0.138
SR-103 Existing, End Ramps to Sepulveda/Willow									
SB Sepulveda Ramp Traffic	0.5904	0.0311	0.0918	0.0048	0.217	0.080	0.170	0.339	0.138
SB+NB Sepulveda Ramp Traffic	0.5904	0.0311	0.0918	0.0048	0.217	0.080	0.170	0.339	0.138
SR-103, Realignment to End (223rd/Wardlow)	0.5904	0.0311	0.0918	0.0048	0.217	0.080	0.170	0.339	0.138
E and W Harry Bridges, Figueroa to start Alameda	0.5904	0.0311	0.0918	0.0048	0.352	0.055	0.313	0.518	0.116
Alameda beginning (E Harry Bridges) to Anaheim	0.5904	0.0311	0.0918	0.0048	0.352	0.055	0.313	0.518	0.116
Alameda Anaheim to Henry Ford	0.5904	0.0311	0.0918	0.0048	0.352	0.055	0.313	0.518	0.116
Alameda, Henry Ford to PCH	0.5904	0.0311	0.0918	0.0048	0.352	0.055	0.313	0.518	0.116
Alameda PCH to 405	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
Alameda 405 to del Amo	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
Alameda, del Amo to South Santa Fe Avenue	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
Alameda, South Santa Fe Avenue to SR-91	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
I-110, "C" Street Interchange to Anaheim	0.5904	0.0311	0.0918	0.0048	0.240	0.070	0.186	0.349	0.126
I-110, Anaheim to PCH	0.5904	0.0311	0.0918	0.0048	0.240	0.070	0.186	0.349	0.126
1-110, PCH to Sepulveda	0.5904	0.0311	0.0918	0.0048	0.240	0.070	0.186	0.349	0.126
I-110, Sepulveda to Carson	0.5904	0.0311	0.0918	0.0048	0.240	0.070	0.186	0.349	0.126
I-110, Carson to Del Amo	0.5904	0.0311	0.0918	0.0048	0.240	0.070	0.186	0.349	0.126
I-110, Del Amo to 405	0.5904	0.0311	0.0918	0.0048	0.240	0.070	0.186	0.349	0.126
I-110, 405 to SR-91	0.5904	0.0311	0.0918	0.0048	0.240	0.070	0.186	0.349	0.126
I-710, Anaheim to PCH	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
I-710, PCH to Willow	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
I-710, Willow to 405	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
I-710, 405 to Del Amo	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
I-710, Del Amo to Long Beach Blvd Interchange	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
I-710, Long Beach Boulevard to SR-91	0.5904	0.0311	0.0918	0.0048	0.270	0.063	0.213	0.381	0.119
PCH, I-110 to Alameda	0.5904	0.0311	0.0918	0.0048	0.463	0.056	0.544	0.756	0.134
PCH, Alameda to SR-103	0.5904	0.0311	0.0918	0.0048	0.463	0.056	0.544	0.756	0.134
PCH, SR-103 to I-710	0.5904	0.0311	0.0918	0.0048	0.463	0.056	0.544	0.756	0.134
Sepulveda, I-110 to Avalon	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
Sepulveda, Avalon to Alameda	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
Sepulveda, Alameda to ICTF	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
Sepulveda, ICTF to SR-103	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
Del Amo, I-110 to Wilmington	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
Del Amo, Wilminton to Alameda	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
Del Amo, Alameda to I-710	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
223rd Street, I-110 to Avalon	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
223rd Street, Avalon to Wilmington	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
223rd Street, Wilmington to Alameda	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122
W Wardlow from Alameda to I-710	0.5904	0.0311	0.0918	0.0048	0.404	0.054	0.403	0.624	0.122

Table B-9
2015 Alternative 2
Maximum Hourly Truck Emissions

	Port		Port		SCAG	SCAG	
	LNG TOG	LNG PM	Dsl + LNG Dsl TOG	Dsl + LNG DPM	Gasoline TOG	Dsl Exhst TOG	Dsl Exhst PM
2015, Alternative 2	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	0.772	0.120	0.43	0.19	0.00	0.00	0.00
Henry Ford Ramps	0.036	0.006	0.04	0.01	0.00	0.00	0.00
Henry Ford n/o Ramps to Alameda	0.137	0.021	0.17	0.02	0.00	0.00	0.00
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.079	0.168	0.65	0.23	0.00	0.01	0.00
SR-103 Anaheim to PCH	0.662	0.103	0.40	0.14	0.00	0.01	0.00
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	0.460	0.071	0.28	0.10	0.01	0.01	0.00
SR-103 Ramps south of Sepulveda/Willow							
NB Sepulveda Ramp (G2 Line)	0.037	0.006	0.02	0.01	0.00	0.00	0.00
SB Sepulveda Ramp (F2 Ramp)	0.026	0.004	0.02	0.01	0.00	0.00	0.00
SR-103 Existing, End Ramps to Sepulveda/Willow							
SB Sepulveda Ramp Traffic	0.005	0.001	0.00	0.00	0.00	0.00	0.00
SB+NB Sepulveda Ramp Traffic	0.019	0.003	0.01	0.00	0.00	0.00	0.00
SR-103, Realignment to End (223rd/Wardlow)	1.487	0.231	0.90	0.31	0.01	0.02	0.01
E and W Harry Bridges, Figueroa to start Alameda	0.371	0.058	0.35	0.05	0.01	0.01	0.00
Alameda beginning (E Harry Bridges) to Anaheim	0.222	0.035	0.21	0.03	0.01	0.02	0.00
Alameda Anaheim to Henry Ford	0.084	0.013	0.08	0.01	0.01	0.01	0.00
Alameda, Henry Ford to PCH	0.123	0.019	0.12	0.02	0.01	0.01	0.00
Alameda PCH to 405	0.706	0.110	0.52	0.12	0.10	0.17	0.05
Alameda 405 to del Amo	1.063	0.165	0.78	0.18	0.09	0.15	0.05
Alameda, del Amo to South Santa Fe Avenue	0.658	0.102	0.49	0.11	0.04	0.06	0.02
Alameda, South Santa Fe Avenue to SR-91	0.435	0.068	0.32	0.07	0.04	0.06	0.02
I-110, "C" Street Interchange to Anaheim	0.214	0.033	0.14	0.04	0.03	0.05	0.02
I-110, Anaheim to PCH	0.571	0.089	0.38	0.11	0.06	0.10	0.04
1-110, PCH to Sepulveda	0.994	0.154	0.66	0.19	0.12	0.21	0.08
I-110, Sepulveda to Carson	1.051	0.163	0.70	0.20	0.18	0.30	0.11
I-110, Carson to Del Amo	0.660	0.103	0.44	0.12	0.13	0.23	0.08
I-110, Del Amo to 405	0.464	0.072	0.31	0.09	0.11	0.20	0.07
I-110, 405 to SR-91	0.603	0.094	0.40	0.11	0.26	0.44	0.16
I-710, Anaheim to PCH	0.730	0.113	0.54	0.12	0.03	0.05	0.02
I-710, PCH to Willow	1.559	0.242	1.15	0.26	0.07	0.12	0.04
I-710, Willow to 405	2.352	0.365	1.74	0.40	0.12	0.19	0.06
I-710, 405 to Del Amo	2.138	0.332	1.58	0.36	0.17	0.28	0.09
I-710, Del Amo to Long Beach Blvd Interchange	1.732	0.269	1.28	0.29	0.16	0.25	0.08
I-710, Long Beach Boulevard to SR-91	1.412	0.220	1.04	0.24	0.18	0.30	0.09
PCH, I-110 to Alameda	0.225	0.035	0.28	0.03	0.21	0.26	0.05
PCH, Alameda to SR-103	0.021	0.003	0.03	0.00	0.04	0.05	0.01
PCH, SR-103 to I-710	0.271	0.042	0.33	0.04	0.05	0.06	0.01
Sepulveda, I-110 to Avalon	0.024	0.004	0.03	0.00	0.04	0.06	0.01
Sepulveda, Avalon to Alameda	0.029	0.005	0.03	0.00	0.06	0.08	0.02
Sepulveda, Alameda to ICTF	0.036	0.006	0.04	0.01	0.01	0.02	0.00
Sepulveda, ICTF to SR-103	0.030	0.005	0.03	0.00	0.00	0.00	0.00
Del Amo, I-110 to Wilmington	0.031	0.005	0.03	0.00	0.13	0.18	0.04
Del Amo, Wilminton to Alameda	0.041	0.006	0.04	0.01	0.06	0.08	0.02
Del Amo, Alameda to I-710	0.031	0.005	0.03	0.00	0.05	0.07	0.01
223rd Street, I-110 to Avalon	0.009	0.001	0.01	0.00	0.05	0.07	0.01
223rd Street, Avalon to Wilmington	0.012	0.002	0.01	0.00	0.04	0.06	0.01
223rd Street, Wilmington to Alameda	0.077	0.012	0.08	0.01	0.05	0.07	0.01
W Wardlow from Alameda to I-710	0.049	0.008	0.05	0.01	0.08	0.12	0.02

Table B-9
2015 Alternative 2
Maximum Hourly Truck Emissions

	Maximum Hourly Toxic Emissions from Trucks														
	DPM	Acetaldehyde	Acrolein	Ammonia	Antimony	Arsenic	Benzene	Bromine	1,3-Butadiene	Cadmium	Chlorine	Chromium (hex)	Copper	Ethylbenzene	Formaldehyde
	9901	75070	107028	7664417	7440360	7440382	71432	7726956	106990	7440439	7782505	18540299	7440508	100414	50000
2015, Alternative 2	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr		lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	1.88E-01	3.23E-02	2.86E-06	6.34E-04	6.78E-06	9.41E-07	8.84E-03	6.78E-06	8.46E-04	7.53E-06	6.48E-05	1.13E-07	4.71E-06	1.34E-03	6.47E-02
Henry Ford Ramps	5.38E-03	3.24E-03	0.00E+00	1.81E-05	1.94E-07	2.69E-08	8.82E-04	1.94E-07	8.37E-05	2.15E-07	1.85E-06	3.23E-09	1.34E-07	1.34E-04	6.48E-03
Henry Ford n/o Ramps to Alameda	2.05E-02	1.23E-02	0.00E+00	6.90E-05	7.38E-07	1.02E-07	3.36E-03	7.38E-07	3.19E-04	8.20E-07	7.05E-06	1.23E-08	5.12E-07	5.12E-04	2.47E-02
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	2.31E-01	4.84E-02	4.55E-06	7.78E-04	8.32E-06	1.16E-06	1.33E-02	8.32E-06	1.27E-03	9.24E-06	7.95E-05	1.39E-07	5.78E-06	2.01E-03	9.69E-02
SR-103 Anaheim to PCH	1.44E-01	3.01E-02	6.46E-06	4.85E-04	5.18E-06	7.19E-07	8.30E-03	5.18E-06	8.04E-04	5.75E-06	4.95E-05	8.63E-08	3.60E-06	1.25E-03	6.03E-02
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	1.02E-01	2.13E-02	8.59E-06	3.44E-04	3.68E-06	5.11E-07	5.95E-03	3.68E-06	5.86E-04	4.08E-06	3.51E-05	6.13E-08	2.55E-06	8.83E-04	4.27E-02
SR-103 Ramps south of Sepulveda/Willow															
NB Sepulveda Ramp (G2 Line)	9.24E-03	1.91E-03	2.33E-06	3.11E-05	3.33E-07	4.62E-08	5.61E-04	3.33E-07	5.90E-05	3.70E-07	3.18E-06	5.54E-09	2.31E-07	7.88E-05	3.83E-03
SB Sepulveda Ramp (F2 Ramp)	6.50E-03	1.34E-03	1.64E-06	2.19E-05	2.34E-07	3.25E-08	3.95E-04	2.34E-07	4.15E-05	2.60E-07	2.24E-06	3.90E-09	1.63E-07	5.55E-05	2.70E-03
SR-103 Existing, End Ramps to Sepulveda/Willow															
SB Sepulveda Ramp Traffic	1.20E-03	2.47E-04	3.03E-07	4.04E-06	4.31E-08	5.99E-09	7.27E-05	4.31E-08	7.64E-06	4.79E-08	4.12E-07	7.19E-10	2.99E-08	1.02E-05	4.97E-04
SB+NB Sepulveda Ramp Traffic	4.71E-03	9.72E-04	1.19E-06	1.59E-05	1.69E-07	2.35E-08	2.86E-04	1.69E-07	3.00E-05	1.88E-07	1.62E-06	2.82E-09	1.18E-07	4.02E-05	1.95E-03
SR-103, Realignment to End (223rd/Wardlow)	3.22E-01	6.74E-02	1.33E-05	1.09E-03	1.16E-05	1.61E-06	1.86E-02	1.16E-05	1.80E-03	1.29E-05	1.11E-04	1.93E-07	8.06E-06	2.80E-03	1.35E-01
E and W Harry Bridges, Figueroa to start Alameda	5.70E-02	2.66E-02	8.87E-06	1.92E-04	2.05E-06	2.85E-07	7.39E-03	2.05E-06	7.24E-04	2.28E-06	1.96E-05	3.42E-08	1.43E-06	1.10E-03	5.32E-02
Alameda beginning (E Harry Bridges) to Anaheim	3.72E-02	1.70E-02	1.71E-05	1.25E-04	1.34E-06	1.86E-07	4.92E-03	1.34E-06	5.09E-04	1.49E-06	1.28E-05	2.23E-08	9.30E-07	7.01E-04	3.41E-02
Alameda Anaheim to Henry Ford	1.52E-02	6.79E-03	1.10E-05	5.12E-05	5.47E-07	7.60E-08	2.04E-03	5.47E-07	2.21E-04	6.08E-07	5.23E-06	9.12E-09	3.80E-07	2.80E-04	1.37E-02
Alameda, Henry Ford to PCH	2.06E-02	9.38E-03	9.10E-06	6.93E-05	7.40E-07	1.03E-07	2.71E-03	7.40E-07	2.80E-04	8.22E-07	7.07E-06	1.23E-08	5.14E-07	3.88E-04	1.88E-02
Alameda PCH to 405	1.71E-01	5.10E-02	1.34E-04	5.76E-04	6.15E-06	8.55E-07	1.63E-02	6.15E-06	1.87E-03	6.84E-06	5.88E-05	1.03E-07	4.27E-06	2.10E-03	1.03E-01
Alameda 405 to del Amo	2.24E-01	6.88E-02	1.17E-04	7.56E-04	8.08E-06	1.12E-06	2.08E-02	8.08E-06	2.26E-03	8.98E-06	7.72E-05	1.35E-07	5.61E-06	2.84E-03	1.39E-01
Alameda, del Amo to South Santa Fe Avenue	1.30E-01	4.04E-02	4.94E-05	4.38E-04	4.68E-06	6.50E-07	1.19E-02	4.68E-06	1.25E-03	5.20E-06	4.47E-05	7.80E-08	3.25E-06	1.67E-03	8.12E-02
Alameda, South Santa Fe Avenue to SR-91	9.13E-02	2.80E-02	4.63E-05	3.07E-04	3.29E-06	4.56E-07	8.45E-03	3.29E-06	9.16E-04	3.65E-06	3.14E-05	5.48E-08	2.28E-06	1.16E-03	5.64E-02
I-110, "C" Street Interchange to Anaheim	5.67E-02	1.39E-02	3.54E-05	1.91E-04	2.04E-06	2.83E-07	4.42E-03	2.04E-06	5.07E-04	2.27E-06	1.95E-05	3.40E-08	1.42E-06	5.73E-04	2.81E-02
I-110, Anaheim to PCH	1.42E-01	3.52E-02	7.45E-05	4.77E-04	5.10E-06	7.08E-07	1.09E-02	5.10E-06	1.22E-03	5.67E-06	4.87E-05	8.50E-08	3.54E-06	1.45E-03	7.09E-02
1-110, PCH to Sepulveda	2.62E-01	6.44E-02	1.62E-04	8.83E-04	9.43E-06	1.31E-06	2.04E-02	9.43E-06	2.34E-03	1.05E-05	9.01E-05	1.57E-07	6.55E-06	2.65E-03	1.30E-01
I-110, Sepulveda to Carson	3.05E-01	7.40E-02	2.31E-04	1.03E-03	1.10E-05	1.53E-06	2.42E-02	1.10E-05	2.87E-03	1.22E-05	1.05E-04	1.83E-07	7.63E-06	3.04E-03	1.50E-01
I-110, Carson to Del Amo	2.06E-01	4.94E-02	1.75E-04	6.93E-04	7.41E-06	1.03E-06	1.66E-02	7.41E-06	2.00E-03	8.23E-06	7.08E-05	1.23E-07	5.14E-06	2.03E-03	1.00E-01
I-110, Del Amo to 405	1.57E-01	3.74E-02	1.50E-04	5.30E-04	5.66E-06	7.86E-07	1.28E-02	5.66E-06	1.59E-03	6.29E-06	5.41E-05	9.43E-08	3.93E-06	1.53E-03	7.59E-02
I-110, 405 to SR-91	2.71E-01	6.26E-02	3.36E-04	9.15E-04	9.77E-06	1.36E-06	2.30E-02	9.77E-06	3.01E-03	1.09E-05	9.34E-05	1.63E-07	6.79E-06	2.56E-03	1.28E-01
I-710, Anaheim to PCH	1.39E-01	4.36E-02	4.14E-05	4.68E-04	5.00E-06	6.95E-07	1.26E-02	5.00E-06	1.30E-03	5.56E-06	4.78E-05	8.34E-08	3.47E-06	1.80E-03	8.75E-02
I-710, PCH to Willow	2.99E-01	9.37E-02	9.53E-05	1.01E-03	1.08E-05	1.50E-06	2.72E-02	1.08E-05	2.82E-03	1.20E-05	1.03E-04	1.80E-07	7.48E-06	3.87E-03	1.88E-01
I-710, Willow to 405	4.54E-01	1.42E-01	1.51E-04	1.53E-03	1.64E-05	2.27E-06	4.13E-02	1.64E-05	4.30E-03	1.82E-05	1.56E-04	2.73E-07	1.14E-05	5.87E-03	2.85E-01
I-710, 405 to Del Amo	4.48E-01	1.38E-01	2.27E-04	1.51E-03	1.61E-05	2.24E-06	4.15E-02	1.61E-05	4.50E-03	1.79E-05	1.54E-04	2.69E-07	1.12E-05	5.68E-03	2.77E-01
I-710, Del Amo to Long Beach Blvd Interchange	3.71E-01	1.13E-01	2.04E-04	1.25E-03	1.34E-05	1.86E-06	3.45E-02	1.34E-05	3.78E-03	1.48E-05	1.28E-04	2.23E-07	9.28E-06	4.68E-03	2.28E-01
I-710, Long Beach Boulevard to SR-91	3.31E-01	9.95E-02	2.41E-04	1.12E-03	1.19E-05	1.66E-06	3.13E-02	1.19E-05	3.57E-03	1.33E-05	1.14E-04	1.99E-07	8.28E-06	4.10E-03	2.01E-01
PCH, I-110 to Alameda	8.06E-02	4.06E-02	2.74E-04	2.71E-04	2.90E-06	4.03E-07	1.59E-02	2.90E-06	2.18E-03	3.22E-06	2.77E-05	4.84E-08	2.01E-06	1.65E-03	8.33E-02
PCH, Alameda to SR-103	1.18E-02	5.64E-03	5.10E-05	3.98E-05	4.25E-07	5.91E-08	2.44E-03	4.25E-07	3.57E-04	4.73E-07	4.06E-06	7.09E-09	2.95E-07	2.28E-04	1.17E-02
PCH, SR-103 to I-710	5.21E-02	2.94E-02	6.69E-05	1.75E-04	1.87E-06	2.60E-07	9.20E-03	1.87E-06	1.04E-03	2.08E-06	1.79E-05	3.12E-08	1.30E-06	1.21E-03	5.94E-02
Sepulveda, I-110 to Avalon	1.57E-02	6.65E-03	5.76E-05	5.27E-05	5.64E-07	7.83E-08	2.83E-03	5.64E-07	4.10E-04	6.26E-07	5.39E-06	9.39E-09	3.91E-07	2.69E-04	1.37E-02
Sepulveda, Avalon to Alameda	2.08E-02	8.78E-03	7.87E-05	7.02E-05	7.50E-07	1.04E-07	3.79E-03	7.50E-07	5.53E-04	8.33E-07	7.16E-06	1.25E-08	5.21E-07	3.54E-04	1.81E-02
Sepulveda, Alameda to ICTF	9.07E-03	4.35E-03	1.81E-05	3.06E-05	3.26E-07	4.53E-08	1.51E-03	3.26E-07	1.87E-04	3.63E-07	3.12E-06	5.44E-09	2.27E-07	1.78E-04	8.84E-03
Sepulveda, ICTF to SR-103	5.13E-03	2.67E-03	3.86E-06	1.73E-05	1.85E-07	2.57E-08	7.97E-04	1.85E-07	8.51E-05	2.05E-07	1.77E-06	3.08E-09	1.28E-07	1.10E-04	5.38E-03
Del Amo, I-110 to Wilmington	3.98E-02	1.62E-02	1.68E-04	1.34E-04	1.43E-06	1.99E-07	7.39E-03	1.43E-06	1.11E-03	1.59E-06	1.37E-05	2.39E-08	9.96E-07	6.52E-04	3.36E-02
Del Amo, Wilminton to Alameda	2.20E-02	9.50E-03	7.56E-05	7.40E-05	7.90E-07	1.10E-07	3.93E-03	7.90E-07	5.59E-04	8.78E-07	7.55E-06	1.32E-08	5.49E-07	3.85E-04	1.95E-02
Del Amo, Alameda to I-710	1.86E-02	7.94E-03	6.64E-05	6.25E-05	6.68E-07	9.28E-08	3.34E-03	6.68E-07	4.81E-04	7.42E-07	6.38E-06	1.11E-08	4.64E-07	3.21E-04	1.64E-02
223rd Street, I-110 to Avalon	1.51E-02	6.06E-03	6.56E-05	5.08E-05	5.42E-07	7.53E-08	2.82E-03	5.42E-07	4.29E-04	6.03E-07	5.18E-06	9.04E-09	3.77E-07	2.44E-04	1.26E-02
223rd Street, Avalon to Wilmington	1.29E-02	5.32E-03	5.30E-05	4.36E-05	4.66E-07	6.47E-08	2.39E-03	4.66E-07	3.57E-04	5.17E-07	4.45E-06	7.76E-09	3.23E-07	2.14E-04	1.10E-02
223rd Street, Wilmington to Alameda	2.42E-02	1.12E-02	6.15E-05	8.15E-05	8.71E-07	1.21E-07	4.14E-03	8.71E-07	5.44E-04	9.68E-07	8.32E-06	1.45E-08	6.05E-07	4.56E-04	2.28E-02
W Wardlow from Alameda to I-710	2.97E-02	1.27E-02	1.07E-04	7.59E-05	8.11E-07	1.13E-07	5.36E-03	8.11E-07	7.71E-04	9.02E-07	7.75E-06	1.35E-08	5.63E-07	5.14E-04	2.62E-02

Table B-9
2015 Alternative 2
Maximum Hourly Truck Emissions

	Maximum Hourly Toxic Emissions from Trucks (continued)														
	n-Hexane	Lead	Manganese	MEK	Mercury	Methanol	Nickel	Propylene	Selenium	Sthrene	Sulfates	Toluene	Vanadium	Xylene	Zinc
	110543	7439921	7439965	78933	7439976	67561	7440020	115071	7782492	100425	9960	108883	7440622	1330207	7440666
2015, Alternative 2	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	6.90E-04	7.91E-06	7.53E-06	6.49E-03	5.65E-06	1.32E-04	3.58E-06	1.14E-02	1.88E-06	2.55E-04	3.28E-03	6.47E-03	5.46E-06	4.35E-01	8.24E-05
Henry Ford Ramps	6.92E-05	2.26E-07	2.15E-07	6.51E-04	1.61E-07	1.32E-05	1.02E-07	1.14E-03	5.38E-08	2.56E-05	9.36E-05	6.49E-04	1.56E-07	4.41E-02	2.36E-06
Henry Ford n/o Ramps to Alameda	2.64E-04	8.61E-07	8.20E-07	2.48E-03	6.15E-07	5.04E-05	3.89E-07	4.36E-03	2.05E-07	9.74E-05	3.57E-04	2.47E-03	5.94E-07	1.68E-01	8.98E-06
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.03E-03	9.70E-06	9.24E-06	9.72E-03	6.93E-06	1.97E-04	4.39E-06	1.71E-02	2.31E-06	3.82E-04	4.02E-03	9.69E-03	6.70E-06	6.52E-01	1.01E-04
SR-103 Anaheim to PCH	6.42E-04	6.04E-06	5.75E-06	6.04E-03	4.32E-06	1.23E-04	2.73E-06	1.06E-02	1.44E-06	2.37E-04	2.50E-03	6.02E-03	4.17E-06	4.00E-01	6.30E-05
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	4.54E-04	4.29E-06	4.08E-06	4.28E-03	3.06E-06	8.68E-05	1.94E-06	7.52E-03	1.02E-06	1.68E-04	1.78E-03	4.26E-03	2.96E-06	2.78E-01	4.47E-05
SR-103 Ramps south of Sepulveda/Willow															
NB Sepulveda Ramp (G2 Line)	4.06E-05	3.88E-07	3.70E-07	3.82E-04	2.77E-07	7.76E-06	1.76E-07	6.71E-04	9.24E-08	1.50E-05	1.61E-04	3.81E-04	2.68E-07	2.27E-02	4.05E-06
SB Sepulveda Ramp (F2 Ramp)	2.86E-05	2.73E-07	2.60E-07	2.69E-04	1.95E-07	5.46E-06	1.24E-07	4.72E-04	6.50E-08	1.06E-05	1.13E-04	2.68E-04	1.89E-07	1.59E-02	2.85E-06
SR-103 Existing, End Ramps to Sepulveda/Willow															
SB Sepulveda Ramp Traffic	5.26E-06	5.03E-08	4.79E-08	4.95E-05	3.59E-08	1.01E-06	2.28E-08	8.70E-05	1.20E-08	1.94E-06	2.08E-05	4.94E-05	3.47E-08	2.94E-03	5.25E-07
SB+NB Sepulveda Ramp Traffic	2.07E-05	1.98E-07	1.88E-07	1.94E-04	1.41E-07	3.95E-06	8.94E-08	3.42E-04	4.71E-08	7.64E-06	8.19E-05	1.94E-04	1.36E-07	1.15E-02	2.06E-06
SR-103, Realignment to End (223rd/Wardlow)	1.44E-03	1.35E-05	1.29E-05	1.35E-02	9.67E-06	2.75E-04	6.12E-06	2.38E-02	3.22E-06	5.32E-04	5.61E-03	1.35E-02	9.35E-06	8.98E-01	1.41E-04
E and W Harry Bridges, Figueroa to start Alameda	5.67E-04	2.39E-06	2.28E-06	5.33E-03	1.71E-06	1.08E-04	1.08E-06	9.38E-03	5.70E-07	2.09E-04	9.92E-04	5.32E-03	1.65E-06	3.51E-01	2.50E-05
Alameda beginning (E Harry Bridges) to Anaheim	3.61E-04	1.56E-06	1.49E-06	3.40E-03	1.12E-06	6.90E-05	7.07E-07	5.97E-03	3.72E-07	1.33E-04	6.48E-04	3.39E-03	1.08E-06	2.10E-01	1.63E-05
Alameda Anaheim to Henry Ford	1.44E-04	6.38E-07	6.08E-07	1.36E-03	4.56E-07	2.76E-05	2.89E-07	2.39E-03	1.52E-07	5.33E-05	2.64E-04	1.35E-03	4.41E-07	7.94E-02	6.66E-06
Alameda, Henry Ford to PCH	2.00E-04	8.63E-07	8.22E-07	1.88E-03	6.17E-07	3.82E-05	3.91E-07	3.30E-03	2.06E-07	7.38E-05	3.58E-04	1.87E-03	5.96E-07	1.17E-01	9.00E-06
Alameda PCH to 405	1.08E-03	7.18E-06	6.84E-06	1.02E-02	5.13E-06	2.07E-04	3.25E-06	1.79E-02	1.71E-06	3.99E-04	2.97E-03	1.01E-02	4.96E-06	5.23E-01	7.49E-05
Alameda 405 to del Amo	1.46E-03	9.43E-06	8.98E-06	1.38E-02	6.73E-06	2.79E-04	4.26E-06	2.42E-02	2.24E-06	5.40E-04	3.91E-03	1.37E-02	6.51E-06	7.87E-01	9.83E-05
Alameda, del Amo to South Santa Fe Avenue	8.60E-04	5.46E-06	5.20E-06	8.09E-03	3.90E-06	1.64E-04	2.47E-06	1.42E-02	1.30E-06	3.18E-04	2.26E-03	8.07E-03	3.77E-06	4.87E-01	5.69E-05
Alameda, South Santa Fe Avenue to SR-91	5.95E-04	3.83E-06	3.65E-06	5.60E-03	2.74E-06	1.14E-04	1.73E-06	9.85E-03	9.13E-07	2.20E-04	1.59E-03	5.59E-03	2.65E-06	3.22E-01	4.00E-05
I-110, "C" Street Interchange to Anaheim	2.95E-04	2.38E-06	2.27E-06	2.78E-03	1.70E-06	5.64E-05	1.08E-06	4.88E-03	5.67E-07	1.09E-04	9.86E-04	2.77E-03	1.64E-06	1.42E-01	2.48E-05
I-110, Anaheim to PCH	7.46E-04	5.95E-06	5.67E-06	7.02E-03	4.25E-06	1.43E-04	2.69E-06	1.23E-02	1.42E-06	2.76E-04	2.47E-03	7.00E-03	4.11E-06	3.79E-01	6.21E-05
1-110, PCH to Sepulveda	1.37E-03	1.10E-05	1.05E-05	1.28E-02	7.86E-06	2.61E-04	4.98E-06	2.26E-02	2.62E-06	5.05E-04	4.56E-03	1.28E-02	7.60E-06	6.61E-01	1.15E-04
I-110, Sepulveda to Carson	1.57E-03	1.28E-05	1.22E-05	1.47E-02	9.15E-06	2.99E-04	5.80E-06	2.59E-02	3.05E-06	5.78E-04	5.31E-03	1.47E-02	8.85E-06	6.99E-01	1.34E-04
I-110, Carson to Del Amo	1.04E-03	8.64E-06	8.23E-06	9.83E-03	6.17E-06	2.00E-04	3.91E-06	1.73E-02	2.06E-06	3.86E-04	3.58E-03	9.80E-03	5.97E-06	4.39E-01	9.01E-05
I-110, Del Amo to 405	7.89E-04	6.60E-06	6.29E-06	7.42E-03	4.72E-06	1.51E-04	2.99E-06	1.30E-02	1.57E-06	2.91E-04	2.74E-03	7.40E-03	4.56E-06	3.09E-01	6.89E-05
I-110, 405 to SR-91	1.32E-03	1.14E-05	1.09E-05	1.24E-02	8.14E-06	2.52E-04	5.16E-06	2.18E-02	2.71E-06	4.86E-04	4.72E-03	1.23E-02	7.87E-06	4.04E-01	1.19E-04
I-710, Anaheim to PCH	9.28E-04	5.84E-06	5.56E-06	8.73E-03	4.17E-06	1.77E-04	2.64E-06	1.53E-02	1.39E-06	3.43E-04	2.42E-03	8.70E-03	4.03E-06	5.40E-01	6.09E-05
I-710, PCH to Willow	1.99E-03	1.26E-05	1.20E-05	1.88E-02	8.98E-06	3.81E-04	5.69E-06	3.30E-02	2.99E-06	7.37E-04	5.21E-03	1.87E-02	8.68E-06	1.15E+00	1.31E-04
I-710, Willow to 405	3.02E-03	1.91E-05	1.82E-05	2.84E-02	1.36E-05	5.78E-04	8.64E-06	5.00E-02	4.54E-06	1.12E-03	7.91E-03	2.84E-02	1.32E-05	1.74E+00	1.99E-04
I-710, 405 to Del Amo	2.92E-03	1.88E-05	1.79E-05	2.75E-02	1.34E-05	5.59E-04	8.52E-06	4.84E-02	4.48E-06	1.08E-03	7.80E-03	2.74E-02	1.30E-05	1.58E+00	1.96E-04
I-710, Del Amo to Long Beach Blvd Interchange	2.41E-03	1.56E-05	1.48E-05	2.27E-02	1.11E-05	4.60E-04	7.05E-06	3.99E-02	3.71E-06	8.90E-04	6.46E-03	2.26E-02	1.08E-05	1.28E+00	1.63E-04
I-710, Long Beach Boulevard to SR-91	2.11E-03	1.39E-05	1.33E-05	1.98E-02	9.94E-06	4.03E-04	6.29E-06	3.49E-02	3.31E-06	7.79E-04	5.76E-03	1.98E-02	9.61E-06	1.05E+00	1.45E-04
PCH, I-110 to Alameda	8.51E-04	3.38E-06	3.22E-06	8.00E-03	2.42E-06	1.63E-04	1.53E-06	1.41E-02	8.06E-07	3.14E-04	1.40E-03	7.98E-03	2.34E-06	2.80E-01	3.53E-05
PCH, Alameda to SR-103	1.17E-04	4.96E-07	4.73E-07	1.10E-03	3.54E-07	2.24E-05	2.25E-07	1.94E-03	1.18E-07	4.33E-05	2.06E-04	1.10E-03	3.43E-07	2.58E-02	5.18E-06
PCH, SR-103 to I-710	6.24E-04	2.19E-06	2.08E-06	5.87E-03	1.56E-06	1.19E-04	9.89E-07	1.03E-02	5.21E-07	2.31E-04	9.06E-04	5.86E-03	1.51E-06	3.34E-01	2.28E-05
Sepulveda, I-110 to Avalon	1.38E-04	6.58E-07	6.26E-07	1.30E-03	4.70E-07	2.64E-05	2.97E-07	2.29E-03	1.57E-07	5.11E-05	2.72E-04	1.30E-03	4.54E-07	2.68E-02	6.86E-06
Sepulveda, Avalon to Alameda	1.82E-04	8.75E-07	8.33E-07	1.72E-03	6.25E-07	3.49E-05	3.96E-07	3.02E-03	2.08E-07	6.74E-05	3.62E-04	1.71E-03	6.04E-07	3.24E-02	9.12E-06
Sepulveda, Alameda to ICTF	9.18E-05	3.81E-07	3.63E-07	8.64E-04	2.72E-07	1.75E-05	1.72E-07	1.52E-03	9.07E-08	3.39E-05	1.58E-04	8.62E-04	2.63E-07	3.92E-02	3.97E-06
Sepulveda, ICTF to SR-103	5.69E-05	2.16E-07	2.05E-07	5.35E-04	1.54E-07	1.09E-05	9.76E-08	9.41E-04	5.13E-08	2.10E-05	8.93E-05	5.34E-04	1.49E-07	3.21E-02	2.25E-06
Del Amo, I-110 to Wilmington	3.36E-04	1.67E-06	1.59E-06	3.16E-03	1.19E-06	6.41E-05	7.57E-07	5.55E-03	3.98E-07	1.24E-04	6.93E-04	3.15E-03	1.15E-06	3.51E-02	1.74E-05
Del Amo, Wilminton to Alameda	1.98E-04	9.22E-07	8.78E-07	1.86E-03	6.59E-07	3.78E-05	4.17E-07	3.28E-03	2.20E-07	7.31E-05	3.82E-04	1.86E-03	6.37E-07	4.56E-02	9.62E-06
Del Amo, Alameda to I-710	1.65E-04	7.79E-07	7.42E-07	1.56E-03	5.57E-07	3.16E-05	3.53E-07	2.74E-03	1.86E-07	6.11E-05	3.23E-04	1.55E-03	5.38E-07	3.46E-02	8.13E-06
223rd Street, I-110 to Avalon	1.25E-04	6.33E-07	6.03E-07	1.18E-03	4.52E-07	2.40E-05	2.86E-07	2.07E-03	1.51E-07	4.63E-05	2.62E-04	1.18E-03	4.37E-07	9.93E-03	6.60E-06
223rd Street, Avalon to Wilmington	1.10E-04	5.43E-07	5.17E-07	1.04E-03	3.88E-07	2.11E-05	2.46E-07	1.82E-03	1.29E-07	4.07E-05	2.25E-04	1.03E-03	3.75E-07	1.37E-02	5.67E-06
223rd Street, Wilmington to Alameda	2.35E-04	1.02E-06	9.68E-07	2.21E-03	7.26E-07	4.49E-05	4.60E-07	3.89E-03	2.42E-07	8.68E-05	4.21E-04	2.20E-03	7.02E-07	8.40E-02	1.06E-05
W Wardlow from Alameda to I-710	2.64E-04	9.47E-07	9.02E-07	2.49E-03	6.76E-07	5.05E-05	4.28E-07	4.37E-03	2.25E-07	9.77E-05	3.92E-04	2.48E-03	6.54E-07	1.75E-03	9.87E-06

Table B-9
2015 Alternative 2
Maximum Hourly Truck Emissions

	Port Trucks - - LNG Exhaust								Port Trucks - - LNG Exhaust								
	TOG	Acetaldehyde	Benzene	Formaldehyde	n-Hexane	Propylene	Toluene	Xylenes	PM10	Bromine	Chlorine	Chromium (hex)	Copper	Manganese	Nickel	Sulfates	Zinc
		75070	71432	50000	110543	115071	108883	1330207		7726956	7782505	18540299	7440508	7439965	7440020	9960	7440666
2015, Alternative 2	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	0.772	2.32E-04	8.49E-04	6.25E-03	1.54E-04	1.30E-02	3.09E-04	1.54E-04	0.120	2.73E-09	3.82E-07	1.36E-10	2.73E-09	2.73E-09	2.73E-09	2.46E-06	2.73E-09
Henry Ford Ramps	0.036	1.08E-05	3.95E-05	2.91E-04	7.17E-06	6.06E-04	1.43E-05	7.17E-06	0.006	7.80E-11	1.09E-08	3.90E-12	7.80E-11	7.80E-11	7.80E-11	7.02E-08	7.80E-11
Henry Ford n/o Ramps to Alameda	0.137	4.10E-05	1.50E-04	1.11E-03	2.73E-05	2.31E-03	5.47E-05	2.73E-05	0.021	2.97E-10	4.16E-08	1.49E-11	2.97E-10	2.97E-10	2.97E-10	2.67E-07	2.97E-10
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.079	3.24E-04	1.19E-03	8.74E-03	2.16E-04	1.82E-02	4.32E-04	2.16E-04	0.168	3.35E-09	4.69E-07	1.67E-10	3.35E-09	3.35E-09	3.35E-09	3.01E-06	3.35E-09
SR-103 Anaheim to PCH	0.662	1.99E-04	7.29E-04	5.37E-03	1.32E-04	1.12E-02	2.65E-04	1.32E-04	0.103	2.09E-09	2.92E-07	1.04E-10	2.09E-09	2.09E-09	2.09E-09	1.88E-06	2.09E-09
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	0.460	1.38E-04	5.06E-04	3.72E-03	9.19E-05	7.77E-03	1.84E-04	9.19E-05	0.071	1.48E-09	2.07E-07	7.40E-11	1.48E-09	1.48E-09	1.48E-09	1.33E-06	1.48E-09
SR-103 Ramps south of Sepulveda/Willow																	
NB Sepulveda Ramp (G2 Line)	0.037	1.12E-05	4.12E-05	3.03E-04	7.49E-06	6.33E-04	1.50E-05	7.49E-06	0.006	1.34E-10	1.88E-08	6.70E-12	1.34E-10	1.34E-10	1.34E-10	1.21E-07	1.34E-10
SB Sepulveda Ramp (F2 Ramp)	0.026	7.91E-06	2.90E-05	2.13E-04	5.27E-06	4.45E-04	1.05E-05	5.27E-06	0.004	9.43E-11	1.32E-08	4.71E-12	9.43E-11	9.43E-11	9.43E-11	8.49E-08	9.43E-11
SR-103 Existing, End Ramps to Sepulveda/Willow																	
SB Sepulveda Ramp Traffic	0.005	1.46E-06	5.34E-06	3.93E-05	9.71E-07	8.20E-05	1.94E-06	9.71E-07	0.001	1.74E-11	2.43E-09	8.69E-13	1.74E-11	1.74E-11	1.74E-11	1.56E-08	1.74E-11
SB+NB Sepulveda Ramp Traffic	0.019	5.72E-06	2.10E-05	1.54E-04	3.81E-06	3.22E-04	7.63E-06	3.81E-06	0.003	6.82E-11	9.55E-09	3.41E-12	6.82E-11	6.82E-11	6.82E-11	6.14E-08	6.82E-11
SR-103, Realignment to End (223rd/Wardlow)	1.487	4.46E-04	1.64E-03	1.20E-02	2.97E-04	2.51E-02	5.95E-04	2.97E-04	0.231	4.67E-09	6.54E-07	2.34E-10	4.67E-09	4.67E-09	4.67E-09	4.21E-06	4.67E-09
E and W Harry Bridges, Figueroa to start Alameda	0.371	1.11E-04	4.08E-04	3.00E-03	7.41E-05	6.26E-03	1.48E-04	7.41E-05	0.058	8.27E-10	1.16E-07	4.13E-11	8.27E-10	8.27E-10	8.27E-10	7.44E-07	8.27E-10
Alameda beginning (E Harry Bridges) to Anaheim	0.222	6.66E-05	2.44E-04	1.80E-03	4.44E-05	3.75E-03	8.88E-05	4.44E-05	0.035	5.40E-10	7.56E-08	2.70E-11	5.40E-10	5.40E-10	5.40E-10	4.86E-07	5.40E-10
Alameda Anaheim to Henry Ford	0.084	2.51E-05	9.21E-05	6.78E-04	1.67E-05	1.41E-03	3.35E-05	1.67E-05	0.013	2.20E-10	3.09E-08	1.10E-11	2.20E-10	2.20E-10	2.20E-10	1.98E-07	2.20E-10
Alameda, Henry Ford to PCH	0.123	3.70E-05	1.36E-04	9.98E-04	2.47E-05	2.08E-03	4.93E-05	2.47E-05	0.019	2.98E-10	4.17E-08	1.49E-11	2.98E-10	2.98E-10	2.98E-10	2.68E-07	2.98E-10
Alameda PCH to 405	0.706	2.12E-04	7.76E-04	5.72E-03	1.41E-04	1.19E-02	2.82E-04	1.41E-04	0.110	2.48E-09	3.47E-07	1.24E-10	2.48E-09	2.48E-09	2.48E-09	2.23E-06	2.48E-09
Alameda 405 to del Amo	1.063	3.19E-04	1.17E-03	8.61E-03	2.13E-04	1.80E-02	4.25E-04	2.13E-04	0.165	3.25E-09	4.56E-07	1.63E-10	3.25E-09	3.25E-09	3.25E-09	2.93E-06	3.25E-09
Alameda, del Amo to South Santa Fe Avenue	0.658	1.97E-04	7.24E-04	5.33E-03	1.32E-04	1.11E-02	2.63E-04	1.32E-04	0.102	1.88E-09	2.64E-07	9.42E-11	1.88E-09	1.88E-09	1.88E-09	1.70E-06	1.88E-09
Alameda, South Santa Fe Avenue to SR-91	0.435	1.31E-04	4.79E-04	3.53E-03	8.71E-05	7.36E-03	1.74E-04	8.71E-05	0.068	1.32E-09	1.85E-07	6.62E-11	1.32E-09	1.32E-09	1.32E-09	1.19E-06	1.32E-09
I-110, "C" Street Interchange to Anaheim	0.214	6.42E-05	2.36E-04	1.73E-03	4.28E-05	3.62E-03	8.56E-05	4.28E-05	0.033	8.22E-10	1.15E-07	4.11E-11	8.22E-10	8.22E-10	8.22E-10	7.40E-07	8.22E-10
I-110, Anaheim to PCH	0.571	1.71E-04	6.28E-04	4.62E-03	1.14E-04	9.65E-03	2.28E-04	1.14E-04	0.089	2.05E-09	2.88E-07	1.03E-10	2.05E-09	2.05E-09	2.05E-09	1.85E-06	2.05E-09
1-110, PCH to Sepulveda	0.994	2.98E-04	1.09E-03	8.05E-03	1.99E-04	1.68E-02	3.98E-04	1.99E-04	0.154	3.80E-09	5.32E-07	1.90E-10	3.80E-09	3.80E-09	3.80E-09	3.42E-06	3.80E-09
I-110, Sepulveda to Carson	1.051	3.15E-04	1.16E-03	8.51E-03	2.10E-04	1.78E-02	4.20E-04	2.10E-04	0.163	4.42E-09	6.19E-07	2.21E-10	4.42E-09	4.42E-09	4.42E-09	3.98E-06	4.42E-09
I-110, Carson to Del Amo	0.660	1.98E-04	7.26E-04	5.34E-03	1.32E-04	1.11E-02	2.64E-04	1.32E-04	0.103	2.98E-09	4.18E-07	1.49E-10	2.98E-09	2.98E-09	2.98E-09	2.69E-06	2.98E-09
I-110, Del Amo to 405	0.464	1.39E-04	5.10E-04	3.76E-03	9.27E-05	7.84E-03	1.85E-04	9.27E-05	0.072	2.28E-09	3.19E-07	1.14E-10	2.28E-09	2.28E-09	2.28E-09	2.05E-06	2.28E-09
I-110, 405 to SR-91	0.603	1.81E-04	6.63E-04	4.88E-03	1.21E-04	1.02E-02	2.41E-04	1.21E-04	0.094	3.94E-09	5.51E-07	1.97E-10	3.94E-09	3.94E-09	3.94E-09	3.54E-06	3.94E-09
I-710, Anaheim to PCH	0.730	2.19E-04	8.03E-04	5.91E-03	1.46E-04	1.23E-02	2.92E-04	1.46E-04	0.113	2.02E-09	2.82E-07	1.01E-10	2.02E-09	2.02E-09	2.02E-09	1.81E-06	2.02E-09
I-710, PCH to Willow	1.559	4.68E-04	1.71E-03	1.26E-02	3.12E-04	2.63E-02	6.24E-04	3.12E-04	0.242	4.34E-09	6.08E-07	2.17E-10	4.34E-09	4.34E-09	4.34E-09	3.91E-06	4.34E-09
I-710, Willow to 405	2.352	7.05E-04	2.59E-03	1.90E-02	4.70E-04	3.97E-02	9.41E-04	4.70E-04	0.365	6.59E-09	9.23E-07	3.29E-10	6.59E-09	6.59E-09	6.59E-09	5.93E-06	6.59E-09
I-710, 405 to Del Amo	2.138	6.41E-04	2.35E-03	1.73E-02	4.28E-04	3.61E-02	8.55E-04	4.28E-04	0.332	6.50E-09	9.10E-07	3.25E-10	6.50E-09	6.50E-09	6.50E-09	5.85E-06	6.50E-09
I-710, Del Amo to Long Beach Blvd Interchange	1.732	5.20E-04	1.91E-03	1.40E-02	3.46E-04	2.93E-02	6.93E-04	3.46E-04	0.269	5.38E-09	7.53E-07	2.69E-10	5.38E-09	5.38E-09	5.38E-09	4.84E-06	5.38E-09
I-710, Long Beach Boulevard to SR-91	1.412	4.24E-04	1.55E-03	1.14E-02	2.82E-04	2.39E-02	5.65E-04	2.82E-04	0.220	4.80E-09	6.73E-07	2.40E-10	4.80E-09	4.80E-09	4.80E-09	4.32E-06	4.80E-09
PCH, I-110 to Alameda	0.225	6.76E-05	2.48E-04	1.83E-03	4.51E-05	3.81E-03	9.02E-05	4.51E-05	0.035	1.17E-09	1.64E-07	5.84E-11	1.17E-09	1.17E-09	1.17E-09	1.05E-06	1.17E-09
PCH, Alameda to SR-103	0.021	6.18E-06	2.26E-05	1.67E-04	4.12E-06	3.48E-04	8.24E-06	4.12E-06	0.003	1.71E-10	2.40E-08	8.57E-12	1.71E-10	1.71E-10	1.71E-10	1.54E-07	1.71E-10
PCH, SR-103 to I-710	0.271	8.13E-05	2.98E-04	2.19E-03	5.42E-05	4.58E-03	1.08E-04	5.42E-05	0.042	7.55E-10	1.06E-07	3.77E-11	7.55E-10	7.55E-10	7.55E-10	6.79E-07	7.55E-10
Sepulveda, I-110 to Avalon	0.024	7.27E-06	2.67E-05	1.96E-04	4.85E-06	4.10E-04	9.69E-06	4.85E-06	0.004	2.27E-10	3.18E-08	1.14E-11	2.27E-10	2.27E-10	2.27E-10	2.04E-07	2.27E-10
Sepulveda, Avalon to Alameda	0.029	8.76E-06	3.21E-05	2.36E-04	5.84E-06	4.93E-04	1.17E-05	5.84E-06	0.005	3.02E-10	4.23E-08	1.51E-11	3.02E-10	3.02E-10	3.02E-10	2.72E-07	3.02E-10
Sepulveda, Alameda to ICTF	0.036	1.09E-05	3.98E-05	2.93E-04	7.23E-06	6.11E-04	1.45E-05	7.23E-06	0.006	1.32E-10	1.84E-08	6.58E-12	1.32E-10	1.32E-10	1.32E-10	1.18E-07	1.32E-10
Sepulveda, ICTF to SR-103	0.030	8.92E-06	3.27E-05	2.41E-04	5.94E-06	5.02E-04	1.19E-05	5.94E-06	0.005	7.44E-11	1.04E-08	3.72E-12	7.44E-11	7.44E-11	7.44E-11	6.70E-08	7.44E-11
Del Amo, I-110 to Wilmington	0.031	9.24E-06	3.39E-05	2.50E-04	6.16E-06	5.21E-04	1.23E-05	6.16E-06	0.005	5.77E-10	8.08E-08	2.89E-11	5.77E-10	5.77E-10	5.77E-10	5.20E-07	5.77E-10
Del Amo, Wilminton to Alameda	0.041	1.24E-05	4.56E-05	3.36E-04	8.29E-06	7.01E-04	1.66E-05	8.29E-06	0.006	3.18E-10	4.46E-08	1.59E-11	3.18E-10	3.18E-10	3.18E-10	2.87E-07	3.18E-10
Del Amo, Alameda to I-710	0.031	9.40E-06	3.45E-05	2.54E-04	6.27E-06	5.30E-04	1.25E-05	6.27E-06	0.005	2.69E-10	3.77E-08	1.35E-11	2.69E-10	2.69E-10	2.69E-10	2.42E-07	2.69E-10
223rd Street, I-110 to Avalon	0.009	2.56E-06	9.37E-06	6.90E-05	1.70E-06	1.44E-04	3.41E-06	1.70E-06	0.001	2.19E-10	3.06E-08	1.09E-11	2.19E-10	2.19E-10	2.19E-10	1.97E-07	2.19E-10
223rd Street, Avalon to Wilmington	0.012	3.64E-06	1.33E-05	9.82E-05	2.42E-06	2.05E-04	4.85E-06	2.42E-06	0.002	1.88E-10	2.63E-08	9.38E-12	1.88E-10	1.88E-10	1.88E-10	1.69E-07	1.88E-10
223rd Street, Wilmington to Alameda	0.077	2.32E-05	8.50E-05	6.26E-04	1.54E-05	1.31E-03	3.09E-05	1.54E-05	0.012	3.51E-10	4.91E-08	1.75E-11	3.51E-10	3.51E-10	3.51E-10	3.16E-07	3.51E-10
W Wardlow from Alameda to I-710	0.049	1.48E-05	5.43E-05	4.00E-04	9.88E-06	8.35E-04	1.98E-05	9.88E-06	0.008	3.27E-10	4.58E-08	1.63E-11	3.27E-10	3.27E-10	3.27E-10	2.94E-07	3.27E-10

Table B-9
2015 Alternative 2
Maximum Hourly Truck Emissions

	Port Trucks - Diesel Exhaust (LNG & Diesel Trucks)												
	TOG	1,3-Butadiene	Acetaldehyde	Benzene	Ethylbenzene	formaldehyde	n-Hexane	Methanol	MEK	Propylene	Sthrene	Toluene	Xylene
		106990	75070	71432	100414	50000	110543	67561	78933	115071	100425	108883	1330207
2015, Alternative 2	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	4.35E-01	8.26E-04	3.20E-02	8.70E-03	1.33E-03	6.40E-02	6.83E-04	1.30E-04	6.42E-03	1.13E-02	2.52E-04	6.41E-03	4.35E-01
Henry Ford Ramps	4.41E-02	8.37E-05	3.24E-03	8.82E-04	1.34E-04	6.48E-03	6.92E-05	1.32E-05	6.51E-04	1.14E-03	2.56E-05	6.49E-04	4.41E-02
Henry Ford n/o Ramps to Alameda	1.68E-01	3.19E-04	1.23E-02	3.36E-03	5.12E-04	2.47E-02	2.64E-04	5.04E-05	2.48E-03	4.36E-03	9.74E-05	2.47E-03	1.68E-01
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	6.52E-01	1.24E-03	4.79E-02	1.30E-02	1.99E-03	9.59E-02	1.02E-03	1.96E-04	9.63E-03	1.69E-02	3.78E-04	9.60E-03	6.52E-01
SR-103 Anaheim to PCH	4.00E-01	7.60E-04	2.94E-02	8.01E-03	1.22E-03	5.89E-02	6.28E-04	1.20E-04	5.91E-03	1.04E-02	2.32E-04	5.89E-03	4.00E-01
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	2.78E-01	5.27E-04	2.04E-02	5.55E-03	8.47E-04	4.08E-02	4.36E-04	8.33E-05	4.10E-03	7.21E-03	1.61E-04	4.09E-03	2.78E-01
SR-103 Ramps south of Sepulveda/Willow													
NB Sepulveda Ramp (G2 Line)	2.26E-02	4.30E-05	1.66E-03	4.53E-04	6.90E-05	3.33E-03	3.55E-05	6.79E-06	3.34E-04	5.87E-04	1.31E-05	3.33E-04	2.26E-02
SB Sepulveda Ramp (F2 Ramp)	1.59E-02	3.02E-05	1.17E-03	3.18E-04	4.85E-05	2.34E-03	2.50E-05	4.77E-06	2.35E-04	4.13E-04	9.23E-06	2.34E-04	1.59E-02
SR-103 Existing, End Ramps to Sepulveda/Willow													
SB Sepulveda Ramp Traffic	2.93E-03	5.57E-06	2.16E-04	5.87E-05	8.94E-06	4.31E-04	4.60E-06	8.80E-07	4.33E-05	7.61E-05	1.70E-06	4.32E-05	2.93E-03
SB+NB Sepulveda Ramp Traffic	1.15E-02	2.19E-05	8.47E-04	2.30E-04	3.51E-05	1.69E-03	1.81E-05	3.46E-06	1.70E-04	2.99E-04	6.68E-06	1.70E-04	1.15E-02
SR-103, Realignment to End (223rd/Wardlow)	8.98E-01	1.71E-03	6.60E-02	1.80E-02	2.74E-03	1.32E-01	1.41E-03	2.69E-04	1.33E-02	2.33E-02	5.21E-04	1.32E-02	8.98E-01
E and W Harry Bridges, Figueroa to start Alameda	3.51E-01	6.67E-04	2.58E-02	7.02E-03	1.07E-03	5.16E-02	5.51E-04	1.05E-04	5.18E-03	9.11E-03	2.03E-04	5.17E-03	3.51E-01
Alameda beginning (E Harry Bridges) to Anaheim	2.10E-01	3.99E-04	1.55E-02	4.21E-03	6.41E-04	3.09E-02	3.30E-04	6.31E-05	3.11E-03	5.46E-03	1.22E-04	3.10E-03	2.10E-01
Alameda Anaheim to Henry Ford	7.92E-02	1.51E-04	5.83E-03	1.59E-03	2.42E-04	1.17E-02	1.24E-04	2.38E-05	1.17E-03	2.06E-03	4.60E-05	1.17E-03	7.92E-02
Alameda, Henry Ford to PCH	1.17E-01	2.22E-04	8.58E-03	2.34E-03	3.56E-04	1.72E-02	1.83E-04	3.50E-05	1.72E-03	3.03E-03	6.77E-05	1.72E-03	1.17E-01
Alameda PCH to 405	5.21E-01	9.90E-04	3.83E-02	1.04E-02	1.59E-03	7.67E-02	8.18E-04	1.56E-04	7.70E-03	1.35E-02	3.02E-04	7.68E-03	5.21E-01
Alameda 405 to del Amo	7.85E-01	1.49E-03	5.77E-02	1.57E-02	2.39E-03	1.16E-01	1.23E-03	2.35E-04	1.16E-02	2.04E-02	4.55E-04	1.16E-02	7.85E-01
Alameda, del Amo to South Santa Fe Avenue	4.86E-01	9.23E-04	3.57E-02	9.72E-03	1.48E-03	7.15E-02	7.63E-04	1.46E-04	7.18E-03	1.26E-02	2.82E-04	7.16E-03	4.86E-01
Alameda, South Santa Fe Avenue to SR-91	3.22E-01	6.11E-04	2.36E-02	6.43E-03	9.81E-04	4.73E-02	5.05E-04	9.65E-05	4.75E-03	8.35E-03	1.86E-04	4.74E-03	3.22E-01
I-110, "C" Street Interchange to Anaheim	1.42E-01	2.69E-04	1.04E-02	2.84E-03	4.33E-04	2.09E-02	2.23E-04	4.25E-05	2.09E-03	3.68E-03	8.23E-05	2.09E-03	1.42E-01
I-110, Anaheim to PCH	3.78E-01	7.18E-04	2.78E-02	7.57E-03	1.15E-03	5.56E-02	5.94E-04	1.13E-04	5.58E-03	9.82E-03	2.19E-04	5.57E-03	3.78E-01
1-110, PCH to Sepulveda	6.58E-01	1.25E-03	4.84E-02	1.32E-02	2.01E-03	9.69E-02	1.03E-03	1.97E-04	9.72E-03	1.71E-02	3.82E-04	9.70E-03	6.58E-01
I-110, Sepulveda to Carson	6.96E-01	1.32E-03	5.12E-02	1.39E-02	2.12E-03	1.02E-01	1.09E-03	2.09E-04	1.03E-02	1.81E-02	4.04E-04	1.03E-02	6.96E-01
I-110, Carson to Del Amo	4.37E-01	8.30E-04	3.21E-02	8.74E-03	1.33E-03	6.43E-02	6.86E-04	1.31E-04	6.45E-03	1.13E-02	2.53E-04	6.44E-03	4.37E-01
I-110, Del Amo to 405	3.07E-01	5.84E-04	2.26E-02	6.15E-03	9.37E-04	4.52E-02	4.82E-04	9.21E-05	4.54E-03	7.98E-03	1.78E-04	4.52E-03	3.07E-01
I-110, 405 to SR-91	3.99E-01	7.58E-04	2.93E-02	7.99E-03	1.22E-03	5.87E-02	6.27E-04	1.20E-04	5.90E-03	1.04E-02	2.32E-04	5.88E-03	3.99E-01
I-710, Anaheim to PCH	5.39E-01	1.02E-03	3.97E-02	1.08E-02	1.64E-03	7.94E-02	8.47E-04	1.62E-04	7.97E-03	1.40E-02	3.13E-04	7.94E-03	5.39E-01
I-710, PCH to Willow	1.15E+00	2.19E-03	8.47E-02	2.30E-02	3.51E-03	1.69E-01	1.81E-03	3.45E-04	1.70E-02	2.99E-02	6.68E-04	1.70E-02	1.15E+00
I-710, Willow to 405	1.74E+00	3.30E-03	1.28E-01	3.48E-02	5.30E-03	2.56E-01	2.73E-03	5.21E-04	2.57E-02	4.51E-02	1.01E-03	2.56E-02	1.74E+00
I-710, 405 to Del Amo	1.58E+00	3.00E-03	1.16E-01	3.16E-02	4.82E-03	2.32E-01	2.48E-03	4.74E-04	2.33E-02	4.10E-02	9.16E-04	2.33E-02	1.58E+00
I-710, Del Amo to Long Beach Blvd Interchange	1.28E+00	2.43E-03	9.41E-02	2.56E-02	3.90E-03	1.88E-01	2.01E-03	3.84E-04	1.89E-02	3.32E-02	7.42E-04	1.88E-02	1.28E+00
I-710, Long Beach Boulevard to SR-91	1.04E+00	1.98E-03	7.67E-02	2.09E-02	3.18E-03	1.53E-01	1.64E-03	3.13E-04	1.54E-02	2.71E-02	6.05E-04	1.54E-02	1.04E+00
PCH, I-110 to Alameda	2.77E-01	5.26E-04	2.04E-02	5.54E-03	8.45E-04	4.08E-02	4.35E-04	8.31E-05	4.09E-03	7.19E-03	1.61E-04	4.08E-03	2.77E-01
PCH, Alameda to SR-103	2.53E-02	4.81E-05	1.86E-03	5.06E-04	7.72E-05	3.72E-03	3.97E-05	7.59E-06	3.74E-04	6.57E-04	1.47E-05	3.73E-04	2.53E-02
PCH, SR-103 to I-710	3.33E-01	6.32E-04	2.45E-02	6.66E-03	1.02E-03	4.90E-02	5.23E-04	9.99E-05	4.92E-03	8.64E-03	1.93E-04	4.90E-03	3.33E-01
Sepulveda, I-110 to Avalon	2.62E-02	4.97E-05	1.92E-03	5.23E-04	7.98E-05	3.85E-03	4.11E-05	7.85E-06	3.86E-04	6.79E-04	1.52E-05	3.85E-04	2.62E-02
Sepulveda, Avalon to Alameda	3.15E-02	5.98E-05	2.32E-03	6.30E-04	9.61E-05	4.63E-03	4.94E-05	9.45E-06	4.65E-04	8.18E-04	1.83E-05	4.64E-04	3.15E-02
Sepulveda, Alameda to ICTF	3.90E-02	7.42E-05	2.87E-03	7.81E-04	1.19E-04	5.74E-03	6.13E-05	1.17E-05	5.76E-04	1.01E-03	2.26E-05	5.75E-04	3.90E-02
Sepulveda, ICTF to SR-103	3.21E-02	6.09E-05	2.36E-03	6.42E-04	9.78E-05	4.72E-03	5.03E-05	9.62E-06	4.74E-04	8.33E-04	1.86E-05	4.72E-04	3.21E-02
Del Amo, I-110 to Wilmington	3.32E-02	6.32E-05	2.44E-03	6.65E-04	1.01E-04	4.89E-03	5.22E-05	9.97E-06	4.91E-04	8.63E-04	1.93E-05	4.90E-04	3.32E-02
Del Amo, Wilminton to Alameda	4.47E-02	8.50E-05	3.29E-03	8.95E-04	1.36E-04	6.58E-03	7.02E-05	1.34E-05	6.61E-04	1.16E-03	2.59E-05	6.59E-04	4.47E-02
Del Amo, Alameda to I-710	3.38E-02	6.42E-05	2.49E-03	6.76E-04	1.03E-04	4.97E-03	5.31E-05	1.01E-05	4.99E-04	8.78E-04	1.96E-05	4.98E-04	3.38E-02
223rd Street, I-110 to Avalon	9.19E-03	1.75E-05	6.76E-04	1.84E-04	2.80E-05	1.35E-03	1.44E-05	2.76E-06	1.36E-04	2.39E-04	5.33E-06	1.35E-04	9.19E-03
223rd Street, Avalon to Wilmington	1.31E-02	2.49E-05	9.62E-04	2.62E-04	3.99E-05	1.92E-03	2.05E-05	3.92E-06	1.93E-04	3.40E-04	7.59E-06	1.93E-04	1.31E-02
223rd Street, Wilmington to Alameda	8.33E-02	1.58E-04	6.13E-03	1.67E-03	2.54E-04	1.23E-02	1.31E-04	2.50E-05	1.23E-03	2.16E-03	4.83E-05	1.23E-03	8.33E-02
W Wardlow from Alameda to I-710	5.33E-02	1.01E-04	3.92E-03	1.07E-03	1.63E-04	7.84E-03	8.37E-05	1.60E-05	7.87E-04	1.38E-03	3.09E-05	7.85E-04	5.55E-04

Table B-9
2015 Alternative 2
Maximum Hourly Truck Emissions

	Port Trucks - Diesel Exhaust (LNG & Diesel Trucks)																	
	DPM	Ammonia	Antimony	Arsenic	Bromine	Bromine	Cadmium	Chlorine	Chromium	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Sulfates	Vanadium	Zinc
		7664417	7440360	7440382	7726956	7726956	7440439	7782505	18540299	7440508	7439921	7439965	7439976	7440020	7782492	9960	7440622	7440666
2015, Alternative 2	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	1.86E-01	6.28E-04	6.71E-06	9.32E-07	3.35E-06	3.35E-06	7.45E-06	6.41E-05	1.12E-07	4.66E-06	7.83E-06	7.45E-06	5.59E-06	3.54E-06	1.86E-06	3.24E-03	5.40E-06	8.16E-05
Henry Ford Ramps	5.38E-03	1.81E-05	1.94E-07	2.69E-08	9.68E-08	9.68E-08	2.15E-07	1.85E-06	3.23E-09	1.34E-07	2.26E-07	2.15E-07	1.61E-07	1.02E-07	5.38E-08	9.36E-05	1.56E-07	2.36E-06
Henry Ford n/o Ramps to Alameda	2.05E-02	6.90E-05	7.38E-07	1.02E-07	3.69E-07	3.69E-07	8.20E-07	7.05E-06	1.23E-08	5.12E-07	8.61E-07	8.20E-07	6.15E-07	3.89E-07	2.05E-07	3.57E-04	5.94E-07	8.98E-06
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	2.28E-01	7.70E-04	8.22E-06	1.14E-06	4.11E-06	4.11E-06	9.14E-06	7.86E-05	1.37E-07	5.71E-06	9.59E-06	9.14E-06	6.85E-06	4.34E-06	2.28E-06	3.97E-03	6.62E-06	1.00E-04
SR-103 Anaheim to PCH	1.40E-01	4.72E-04	5.05E-06	7.01E-07	2.52E-06	2.52E-06	5.61E-06	4.82E-05	8.41E-08	3.51E-06	5.89E-06	5.61E-06	4.21E-06	2.66E-06	1.40E-06	2.44E-03	4.07E-06	6.14E-05
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	9.73E-02	3.28E-04	3.50E-06	4.86E-07	1.75E-06	1.75E-06	3.89E-06	3.35E-05	5.84E-08	2.43E-06	4.09E-06	3.89E-06	2.92E-06	1.85E-06	9.73E-07	1.69E-03	2.82E-06	4.26E-05
SR-103 Ramps south of Sepulveda/Willow																		
NB Sepulveda Ramp (G2 Line)	7.93E-03	2.67E-05	2.85E-07	3.96E-08	1.43E-07	1.43E-07	3.17E-07	2.73E-06	4.76E-09	1.98E-07	3.33E-07	3.17E-07	2.38E-07	1.51E-07	7.93E-08	1.38E-04	2.30E-07	3.47E-06
SB Sepulveda Ramp (F2 Ramp)	5.58E-03	1.88E-05	2.01E-07	2.79E-08	1.00E-07	1.00E-07	2.23E-07	1.92E-06	3.35E-09	1.39E-07	2.34E-07	2.23E-07	1.67E-07	1.06E-07	5.58E-08	9.71E-05	1.62E-07	2.44E-06
SR-103 Existing, End Ramps to Sepulveda/Willow																		
SB Sepulveda Ramp Traffic	1.03E-03	3.46E-06	3.70E-08	5.14E-09	1.85E-08	1.85E-08	4.11E-08	3.54E-07	6.17E-10	2.57E-08	4.32E-08	4.11E-08	3.08E-08	1.95E-08	1.03E-08	1.79E-05	2.98E-08	4.50E-07
SB+NB Sepulveda Ramp Traffic	4.04E-03	1.36E-05	1.45E-07	2.02E-08	7.27E-08	7.27E-08	1.61E-07	1.39E-06	2.42E-09	1.01E-07	1.70E-07	1.61E-07	1.21E-07	7.67E-08	4.04E-08	7.02E-05	1.17E-07	1.77E-06
SR-103, Realignment to End (223rd/Wardlow)	3.15E-01	1.06E-03	1.13E-05	1.57E-06	5.67E-06	5.67E-06	1.26E-05	1.08E-04	1.89E-07	7.87E-06	1.32E-05	1.26E-05	9.44E-06	5.98E-06	3.15E-06	5.48E-03	9.13E-06	1.38E-04
E and W Harry Bridges, Figueroa to start Alameda	5.47E-02	1.84E-04	1.97E-06	2.74E-07	9.85E-07	9.85E-07	2.19E-06	1.88E-05	3.28E-08	1.37E-06	2.30E-06	2.19E-06	1.64E-06	1.04E-06	5.47E-07	9.52E-04	1.59E-06	2.40E-05
Alameda beginning (E Harry Bridges) to Anaheim	3.28E-02	1.10E-04	1.18E-06	1.64E-07	5.90E-07	5.90E-07	1.31E-06	1.13E-05	1.97E-08	8.20E-07	1.38E-06	1.31E-06	9.84E-07	6.23E-07	3.28E-07	5.70E-04	9.51E-07	1.44E-05
Alameda Anaheim to Henry Ford	1.24E-02	4.16E-05	4.45E-07	6.18E-08	2.22E-07	2.22E-07	4.94E-07	4.25E-06	7.41E-09	3.09E-07	5.19E-07	4.94E-07	3.71E-07	2.35E-07	1.24E-07	2.15E-04	3.58E-07	5.41E-06
Alameda, Henry Ford to PCH	1.82E-02	6.13E-05	6.55E-07	9.10E-08	3.28E-07	3.28E-07	7.28E-07	6.26E-06	1.09E-08	4.55E-07	7.64E-07	7.28E-07	5.46E-07	3.46E-07	1.82E-07	3.17E-04	5.28E-07	7.97E-06
Alameda PCH to 405	1.19E-01	4.00E-04	4.27E-06	5.94E-07	2.14E-06	2.14E-06	4.75E-06	4.08E-05	7.12E-08	2.97E-06	4.99E-06	4.75E-06	3.56E-06	2.26E-06	1.19E-06	2.07E-03	3.44E-06	5.20E-05
Alameda 405 to del Amo	1.79E-01	6.02E-04	6.44E-06	8.94E-07	3.22E-06	3.22E-06	7.15E-06	6.15E-05	1.07E-07	4.47E-06	7.51E-06	7.15E-06	5.36E-06	3.40E-06	1.79E-06	3.11E-03	5.19E-06	7.83E-05
Alameda, del Amo to South Santa Fe Avenue	1.11E-01	3.73E-04	3.98E-06	5.53E-07	1.99E-06	1.99E-06	4.43E-06	3.81E-05	6.64E-08	2.77E-06	4.65E-06	4.43E-06	3.32E-06	2.10E-06	1.11E-06	1.93E-03	3.21E-06	4.85E-05
Alameda, South Santa Fe Avenue to SR-91	7.32E-02	2.47E-04	2.64E-06	3.66E-07	1.32E-06	1.32E-06	2.93E-06	2.52E-05	4.39E-08	1.83E-06	3.08E-06	2.93E-06	2.20E-06	1.39E-06	7.32E-07	1.27E-03	2.12E-06	3.21E-05
I-110, "C" Street Interchange to Anaheim	3.99E-02	1.35E-04	1.44E-06	2.00E-07	7.19E-07	7.19E-07	1.60E-06	1.37E-05	2.40E-08	9.98E-07	1.68E-06	1.60E-06	1.20E-06	7.59E-07	3.99E-07	6.95E-04	1.16E-06	1.75E-05
I-110, Anaheim to PCH	1.06E-01	3.59E-04	3.83E-06	5.32E-07	1.92E-06	1.92E-06	4.26E-06	3.66E-05	6.39E-08	2.66E-06	4.47E-06	4.26E-06	3.19E-06	2.02E-06	1.06E-06	1.85E-03	3.09E-06	4.66E-05
1-110, PCH to Sepulveda	1.85E-01	6.25E-04	6.67E-06	9.27E-07	3.34E-06	3.34E-06	7.42E-06	6.38E-05	1.11E-07	4.63E-06	7.79E-06	7.42E-06	5.56E-06	3.52E-06	1.85E-06	3.23E-03	5.38E-06	8.12E-05
I-110, Sepulveda to Carson	1.96E-01	6.60E-04	7.06E-06	9.80E-07	3.53E-06	3.53E-06	7.84E-06	6.74E-05	1.18E-07	4.90E-06	8.23E-06	7.84E-06	5.88E-06	3.72E-06	1.96E-06	3.41E-03	5.68E-06	8.59E-05
I-110, Carson to Del Amo	1.23E-01	4.15E-04	4.43E-06	6.15E-07	2.21E-06	2.21E-06	4.92E-06	4.23E-05	7.38E-08	3.08E-06	5.17E-06	4.92E-06	3.69E-06	2.34E-06	1.23E-06	2.14E-03	3.57E-06	5.39E-05
I-110, Del Amo to 405	8.65E-02	2.91E-04	3.11E-06	4.32E-07	1.56E-06	1.56E-06	3.46E-06	2.98E-05	5.19E-08	2.16E-06	3.63E-06	3.46E-06	2.59E-06	1.64E-06	8.65E-07	1.51E-03	2.51E-06	3.79E-05
I-110, 405 to SR-91	1.12E-01	3.79E-04	4.05E-06	5.62E-07	2.02E-06	2.02E-06	4.50E-06	3.87E-05	6.74E-08	2.81E-06	4.72E-06	4.50E-06	3.37E-06	2.14E-06	1.12E-06	1.96E-03	3.26E-06	4.92E-05
I-710, Anaheim to PCH	1.23E-01	4.14E-04	4.42E-06	6.14E-07	2.21E-06	2.21E-06	4.91E-06	4.23E-05	7.37E-08	3.07E-06	5.16E-06	4.91E-06	3.69E-06	2.33E-06	1.23E-06	2.14E-03	3.56E-06	5.38E-05
I-710, PCH to Willow	2.62E-01	8.84E-04	9.44E-06	1.31E-06	4.72E-06	4.72E-06	1.05E-05	9.02E-05	1.57E-07	6.56E-06	1.10E-05	1.05E-05	7.87E-06	4.98E-06	2.62E-06	4.56E-03	7.61E-06	1.15E-04
I-710, Willow to 405	3.96E-01	1.33E-03	1.42E-05	1.98E-06	7.12E-06	7.12E-06	1.58E-05	1.36E-04	2.37E-07	9.89E-06	1.66E-05	1.58E-05	1.19E-05	7.52E-06	3.96E-06	6.88E-03	1.15E-05	1.73E-04
I-710, 405 to Del Amo	3.60E-01	1.21E-03	1.29E-05	1.80E-06	6.47E-06	6.47E-06	1.44E-05	1.24E-04	2.16E-07	8.99E-06	1.51E-05	1.44E-05	1.08E-05	6.83E-06	3.60E-06	6.26E-03	1.04E-05	1.58E-04
I-710, Del Amo to Long Beach Blvd Interchange	2.91E-01	9.82E-04	1.05E-05	1.46E-06	5.25E-06	5.25E-06	1.17E-05	1.00E-04	1.75E-07	7.29E-06	1.22E-05	1.17E-05	8.74E-06	5.54E-06	2.91E-06	5.07E-03	8.45E-06	1.28E-04
I-710, Long Beach Boulevard to SR-91	2.38E-01	8.01E-04	8.55E-06	1.19E-06	4.28E-06	4.28E-06	9.50E-06	8.17E-05	1.43E-07	5.94E-06	9.98E-06	9.50E-06	7.13E-06	4.51E-06	2.38E-06	4.13E-03	6.89E-06	1.04E-04
PCH, I-110 to Alameda	3.38E-02	1.14E-04	1.22E-06	1.69E-07	6.08E-07	6.08E-07	1.35E-06	1.16E-05	2.03E-08	8.45E-07	1.42E-06	1.35E-06	1.01E-06	6.42E-07	3.38E-07	5.88E-04	9.80E-07	1.48E-05
PCH, Alameda to SR-103	3.09E-03	1.04E-05	1.11E-07	1.54E-08	5.56E-08	5.56E-08	1.23E-07	1.06E-06	1.85E-09	7.72E-08	1.30E-07	1.23E-07	9.26E-08	5.87E-08	3.09E-08	5.37E-05	8.95E-08	1.35E-06
PCH, SR-103 to I-710	4.06E-02	1.37E-04	1.46E-06	2.03E-07	7.31E-07	7.31E-07	1.62E-06	1.40E-05	2.44E-08	1.02E-06	1.71E-06	1.62E-06	1.22E-06	7.72E-07	4.06E-07	7.07E-04	1.18E-06	1.78E-05
Sepulveda, I-110 to Avalon	3.52E-03	1.19E-05	1.27E-07	1.76E-08	6.34E-08	6.34E-08	1.41E-07	1.21E-06	2.11E-09	8.81E-08	1.48E-07	1.41E-07	1.06E-07	6.69E-08	3.52E-08	6.13E-05	1.02E-07	1.54E-06
Sepulveda, Avalon to Alameda	4.24E-03	1.43E-05	1.53E-07	2.12E-08	7.64E-08	7.64E-08	1.70E-07	1.46E-06	2.55E-09	1.06E-07	1.78E-07	1.70E-07	1.27E-07	8.06E-08	4.24E-08	7.38E-05	1.23E-07	1.86E-06
Sepulveda, Alameda to ICTF	5.26E-03	1.77E-05	1.89E-07	2.63E-08	9.46E-08	9.46E-08	2.10E-07	1.81E-06	3.15E-09	1.31E-07	2.21E-07	2.10E-07	1.58E-07	9.99E-08	5.26E-08	9.15E-05	1.52E-07	2.30E-06
Sepulveda, ICTF to SR-103	4.32E-03	1.46E-05	1.56E-07	2.16E-08	7.78E-08	7.78E-08	1.73E-07	1.49E-06	2.59E-09	1.08E-07	1.81E-07	1.73E-07	1.30E-07	8.21E-08	4.32E-08	7.52E-05	1.25E-07	1.89E-06
Del Amo, I-110 to Wilmington	4.48E-03	1.51E-05	1.61E-07	2.24E-08	8.06E-08	8.06E-08	1.79E-07	1.54E-06	2.69E-09	1.12E-07	1.88E-07	1.79E-07	1.34E-07	8.51E-08	4.48E-08	7.79E-05	1.30E-07	1.96E-06
Del Amo, Wilminton to Alameda	6.03E-03	2.03E-05	2.17E-07	3.01E-08	1.08E-07	1.08E-07	2.41E-07	2.07E-06	3.62E-09	1.51E-07	2.53E-07	2.41E-07	1.81E-07	1.14E-07	6.03E-08	1.05E-04	1.75E-07	2.64E-06
Del Amo, Alameda to I-710	4.55E-03	1.53E-05	1.64E-07	2.28E-08	8.20E-08	8.20E-08	1.82E-07	1.57E-06	2.73E-09	1.14E-07	1.91E-07	1.82E-07	1.37E-07	8.65E-08	4.55E-08	7.93E-05	1.32E-07	1.99E-06
223rd Street, I-110 to Avalon	1.24E-03	4.17E-06	4.46E-08	6.19E-09	2.23E-08	2.23E-08	4.95E-08	4.26E-07	7.43E-10	3.10E-08	5.20E-08	4.95E-08	3.71E-08	2.35E-08	1.24E-08	2.15E-05	3.59E-08	5.42E-07
223rd Street, Avalon to Wilmington	1.76E-03	5.94E-06	6.34E-08	8.81E-09	3.17E-08	3.17E-08	7.05E-08	6.06E-07	1.06E-09	4.41E-08	7.40E-08	7.05E-08	5.29E-08	3.35E-08	1.76E-08	3.07E-05	5.11E-08	7.72E-07
223rd Street, Wilmington to Alameda	1.12E-02	3.78E-05	4.04E-07	5.61E-08	2.02E-07	2.02E-07	4.49E-07	3.86E-06	6.74E-09	2.81E-07	4.72E-07	4.49E-07	3.37E-07	2.13E-07	1.12E-07	1.95E-04	3.26E-07	4.92E-06
W Wardlow from Alameda to I-710		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table B-9
2015 Alternative 2
Maximum Hourly Truck Emissions

	SCAG Gasoline Truck Emissions					
	TOG	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
		71432	50000	106990	75070	107028
2015, Alternative 2	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	2.18E-03	5.31E-05	3.73E-05	1.21E-05	8.39E-06	2.86E-06
Henry Ford Ramps	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Henry Ford n/o Ramps to Alameda	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	3.47E-03	8.46E-05	5.94E-05	1.92E-05	1.34E-05	4.55E-06
SR-103 Anaheim to PCH	4.93E-03	1.20E-04	8.43E-05	2.73E-05	1.90E-05	6.46E-06
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	6.56E-03	1.60E-04	1.12E-04	3.63E-05	2.52E-05	8.59E-06
SR-103 Ramps south of Sepulveda/Willow						
NB Sepulveda Ramp (G2 Line)	1.78E-03	4.34E-05	3.05E-05	9.86E-06	6.86E-06	2.33E-06
SB Sepulveda Ramp (F2 Ramp)	1.25E-03	3.05E-05	2.14E-05	6.94E-06	4.83E-06	1.64E-06
SR-103 Existing, End Ramps to Sepulveda/Willow						
SB Sepulveda Ramp Traffic	2.31E-04	5.63E-06	3.95E-06	1.28E-06	8.90E-07	3.03E-07
SB+NB Sepulveda Ramp Traffic	9.08E-04	2.21E-05	1.55E-05	5.02E-06	3.49E-06	1.19E-06
SR-103, Realignment to End (223rd/Wardlow)	1.02E-02	2.48E-04	1.74E-04	5.63E-05	3.92E-05	1.33E-05
E and W Harry Bridges, Figueroa to start Alameda	6.77E-03	1.65E-04	1.16E-04	3.75E-05	2.61E-05	8.87E-06
Alameda beginning (E Harry Bridges) to Anaheim	1.31E-02	3.18E-04	2.23E-04	7.22E-05	5.03E-05	1.71E-05
Alameda Anaheim to Henry Ford	8.37E-03	2.04E-04	1.43E-04	4.63E-05	3.22E-05	1.10E-05
Alameda, Henry Ford to PCH	6.94E-03	1.69E-04	1.19E-04	3.84E-05	2.67E-05	9.10E-06
Alameda PCH to 405	1.02E-01	2.49E-03	1.75E-03	5.66E-04	3.94E-04	1.34E-04
Alameda 405 to del Amo	8.95E-02	2.18E-03	1.53E-03	4.95E-04	3.45E-04	1.17E-04
Alameda, del Amo to South Santa Fe Avenue	3.77E-02	9.19E-04	6.45E-04	2.09E-04	1.45E-04	4.94E-05
Alameda, South Santa Fe Avenue to SR-91	3.54E-02	8.61E-04	6.05E-04	1.96E-04	1.36E-04	4.63E-05
I-110, "C" Street Interchange to Anaheim	2.70E-02	6.58E-04	4.62E-04	1.49E-04	1.04E-04	3.54E-05
I-110, Anaheim to PCH	5.69E-02	1.38E-03	9.72E-04	3.14E-04	2.19E-04	7.45E-05
1-110, PCH to Sepulveda	1.24E-01	3.01E-03	2.12E-03	6.84E-04	4.76E-04	1.62E-04
I-110, Sepulveda to Carson	1.76E-01	4.29E-03	3.01E-03	9.74E-04	6.78E-04	2.31E-04
I-110, Carson to Del Amo	1.33E-01	3.25E-03	2.28E-03	7.38E-04	5.14E-04	1.75E-04
I-110, Del Amo to 405	1.14E-01	2.78E-03	1.95E-03	6.31E-04	4.39E-04	1.50E-04
I-110, 405 to SR-91	2.57E-01	6.25E-03	4.39E-03	1.42E-03	9.88E-04	3.36E-04
I-710, Anaheim to PCH	3.16E-02	7.70E-04	5.40E-04	1.75E-04	1.22E-04	4.14E-05
I-710, PCH to Willow	7.27E-02	1.77E-03	1.24E-03	4.02E-04	2.80E-04	9.53E-05
I-710, Willow to 405	1.15E-01	2.81E-03	1.97E-03	6.38E-04	4.44E-04	1.51E-04
I-710, 405 to Del Amo	1.73E-01	4.22E-03	2.96E-03	9.59E-04	6.68E-04	2.27E-04
I-710, Del Amo to Long Beach Blvd Interchange	1.56E-01	3.80E-03	2.67E-03	8.63E-04	6.01E-04	2.04E-04
I-710, Long Beach Boulevard to SR-91	1.84E-01	4.47E-03	3.14E-03	1.02E-03	7.07E-04	2.41E-04
PCH, I-110 to Alameda	2.09E-01	5.08E-03	3.57E-03	1.15E-03	8.04E-04	2.74E-04
PCH, Alameda to SR-103	3.90E-02	9.49E-04	6.66E-04	2.15E-04	1.50E-04	5.10E-05
PCH, SR-103 to I-710	5.11E-02	1.24E-03	8.73E-04	2.82E-04	1.97E-04	6.69E-05
Sepulveda, I-110 to Avalon	4.39E-02	1.07E-03	7.51E-04	2.43E-04	1.69E-04	5.76E-05
Sepulveda, Avalon to Alameda	6.01E-02	1.46E-03	1.03E-03	3.32E-04	2.31E-04	7.87E-05
Sepulveda, Alameda to ICTF	1.38E-02	3.36E-04	2.36E-04	7.63E-05	5.31E-05	1.81E-05
Sepulveda, ICTF to SR-103	2.95E-03	7.18E-05	5.04E-05	1.63E-05	1.14E-05	3.86E-06
Del Amo, I-110 to Wilmington	1.28E-01	3.12E-03	2.19E-03	7.08E-04	4.93E-04	1.68E-04
Del Amo, Wilminton to Alameda	5.77E-02	1.40E-03	9.86E-04	3.19E-04	2.22E-04	7.56E-05
Del Amo, Alameda to I-710	5.07E-02	1.23E-03	8.67E-04	2.80E-04	1.95E-04	6.64E-05
223rd Street, I-110 to Avalon	5.01E-02	1.22E-03	8.56E-04	2.77E-04	1.93E-04	6.56E-05
223rd Street, Avalon to Wilmington	4.05E-02	9.85E-04	6.92E-04	2.24E-04	1.56E-04	5.30E-05
223rd Street, Wilmington to Alameda	4.70E-02	1.14E-03	8.03E-04	2.60E-04	1.81E-04	6.15E-05
W Wardlow from Alameda to I-710	8.16E-02	1.99E-03	1.40E-03	4.51E-04	3.14E-04	1.07E-04

Table B-9
2015 Alternative 2
Maximum Hourly Truck Emissions

	SCAG Diesel Truck Exhaust												
	TOG	1,3-Butadiene	Acetaldehyde	Benzene	Ethylbenzene	formaldehyde	n-Hexane	Methanol	MEK	Propylene	Sthrene	Toluene	Xylene
		106990	75070	71432	100414	50000	110543	67561	78933	115071	100425	108883	1330207
2015, Alternative 2	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	4.34E-03	8.25E-06	3.19E-04	8.69E-05	1.32E-05	6.39E-04	6.82E-06	1.30E-06	6.41E-05	1.13E-04	2.52E-06	6.40E-05	4.52E-05
Henry Ford Ramps	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Henry Ford n/o Ramps to Alameda	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	6.30E-03	1.20E-05	4.63E-04	1.26E-04	1.92E-05	9.27E-04	9.90E-06	1.89E-06	9.31E-05	1.64E-04	3.66E-06	9.28E-05	6.56E-05
SR-103 Anaheim to PCH	8.94E-03	1.70E-05	6.57E-04	1.79E-04	2.73E-05	1.32E-03	1.40E-05	2.68E-06	1.32E-04	2.32E-04	5.19E-06	1.32E-04	9.31E-05
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	1.19E-02	2.26E-05	8.75E-04	2.38E-04	3.63E-05	1.75E-03	1.87E-05	3.57E-06	1.76E-04	3.09E-04	6.90E-06	1.75E-04	1.24E-04
SR-103 Ramps south of Sepulveda/Willow													
NB Sepulveda Ramp (G2 Line)	3.23E-03	6.14E-06	2.38E-04	6.47E-05	9.86E-06	4.76E-04	5.08E-06	9.70E-07	4.78E-05	8.40E-05	1.88E-06	4.76E-05	3.37E-05
SB Sepulveda Ramp (F2 Ramp)	2.28E-03	4.32E-06	1.67E-04	4.55E-05	6.94E-06	3.35E-04	3.57E-06	6.83E-07	3.36E-05	5.91E-05	1.32E-06	3.35E-05	2.37E-05
SR-103 Existing, End Ramps to Sepulveda/Willow													
SB Sepulveda Ramp Traffic	4.19E-04	7.97E-07	3.08E-05	8.39E-06	1.28E-06	6.17E-05	6.58E-07	1.26E-07	6.19E-06	1.09E-05	2.43E-07	6.18E-06	4.36E-06
SB+NB Sepulveda Ramp Traffic	1.65E-03	3.13E-06	1.21E-04	3.30E-05	5.02E-06	2.42E-04	2.59E-06	4.94E-07	2.43E-05	4.28E-05	9.55E-07	2.43E-05	1.71E-05
SR-103, Realignment to End (223rd/Wardlow)	1.85E-02	3.51E-05	1.36E-03	3.70E-04	5.63E-05	2.72E-03	2.90E-05	5.54E-06	2.73E-04	4.80E-04	1.07E-05	2.72E-04	1.92E-04
E and W Harry Bridges, Figueroa to start Alameda	1.02E-02	1.94E-05	7.52E-04	2.05E-04	3.12E-05	1.50E-03	1.60E-05	3.07E-06	1.51E-04	2.65E-04	5.93E-06	1.51E-04	1.06E-04
Alameda beginning (E Harry Bridges) to Anaheim	1.97E-02	3.74E-05	1.45E-03	3.94E-04	6.01E-05	2.90E-03	3.09E-05	5.91E-06	2.91E-04	5.12E-04	1.14E-05	2.90E-04	2.05E-04
Alameda Anaheim to Henry Ford	1.26E-02	2.40E-05	9.29E-04	2.53E-04	3.85E-05	1.86E-03	1.98E-05	3.79E-06	1.87E-04	3.28E-04	7.33E-06	1.86E-04	1.32E-04
Alameda, Henry Ford to PCH	1.05E-02	1.99E-05	7.71E-04	2.10E-04	3.20E-05	1.54E-03	1.65E-05	3.14E-06	1.55E-04	2.72E-04	6.08E-06	1.54E-04	1.09E-04
Alameda PCH to 405	1.67E-01	3.17E-04	1.23E-02	3.34E-03	5.10E-04	2.46E-02	2.62E-04	5.01E-05	2.47E-03	4.34E-03	9.69E-05	2.46E-03	1.74E-03
Alameda 405 to del Amo	1.46E-01	2.78E-04	1.07E-02	2.93E-03	4.46E-04	2.15E-02	2.30E-04	4.39E-05	2.16E-03	3.80E-03	8.48E-05	2.15E-03	1.52E-03
Alameda, del Amo to South Santa Fe Avenue	6.16E-02	1.17E-04	4.53E-03	1.23E-03	1.88E-04	9.07E-03	9.68E-05	1.85E-05	9.10E-04	1.60E-03	3.58E-05	9.08E-04	6.42E-04
Alameda, South Santa Fe Avenue to SR-91	5.78E-02	1.10E-04	4.25E-03	1.16E-03	1.76E-04	8.50E-03	9.07E-05	1.73E-05	8.53E-04	1.50E-03	3.35E-05	8.51E-04	6.01E-04
I-110, "C" Street Interchange to Anaheim	4.62E-02	8.78E-05	3.40E-03	9.25E-04	1.41E-04	6.80E-03	7.26E-05	1.39E-05	6.83E-04	1.20E-03	2.68E-05	6.81E-04	4.81E-04
I-110, Anaheim to PCH	9.73E-02	1.85E-04	7.15E-03	1.95E-03	2.97E-04	1.43E-02	1.53E-04	2.92E-05	1.44E-03	2.53E-03	5.64E-05	1.43E-03	1.01E-03
1-110, PCH to Sepulveda	2.12E-01	4.02E-04	1.56E-02	4.24E-03	6.46E-04	3.11E-02	3.32E-04	6.35E-05	3.13E-03	5.50E-03	1.23E-04	3.12E-03	2.20E-03
I-110, Sepulveda to Carson	3.01E-01	5.72E-04	2.21E-02	6.03E-03	9.19E-04	4.43E-02	4.73E-04	9.04E-05	4.45E-03	7.82E-03	1.75E-04	4.44E-03	3.14E-03
I-110, Carson to Del Amo	2.28E-01	4.34E-04	1.68E-02	4.57E-03	6.96E-04	3.36E-02	3.59E-04	6.85E-05	3.37E-03	5.93E-03	1.32E-04	3.36E-03	2.38E-03
I-110, Del Amo to 405	1.95E-01	3.71E-04	1.44E-02	3.91E-03	5.96E-04	2.87E-02	3.07E-04	5.86E-05	2.88E-03	5.07E-03	1.13E-04	2.88E-03	2.03E-03
I-110, 405 to SR-91	4.39E-01	8.35E-04	3.23E-02	8.79E-03	1.34E-03	6.46E-02	6.90E-04	1.32E-04	6.49E-03	1.14E-02	2.55E-04	6.47E-03	4.57E-03
I-710, Anaheim to PCH	5.16E-02	9.81E-05	3.80E-03	1.03E-03	1.57E-04	7.60E-03	8.11E-05	1.55E-05	7.63E-04	1.34E-03	2.99E-05	7.60E-04	5.37E-04
I-710, PCH to Willow	1.19E-01	2.26E-04	8.74E-03	2.38E-03	3.62E-04	1.75E-02	1.87E-04	3.56E-05	1.76E-03	3.09E-03	6.89E-05	1.75E-03	1.24E-03
I-710, Willow to 405	1.89E-01	3.58E-04	1.39E-02	3.77E-03	5.75E-04	2.77E-02	2.96E-04	5.66E-05	2.79E-03	4.90E-03	1.09E-04	2.78E-03	1.96E-03
I-710, 405 to Del Amo	2.83E-01	5.38E-04	2.08E-02	5.67E-03	8.64E-04	4.17E-02	4.45E-04	8.50E-05	4.18E-03	7.36E-03	1.64E-04	4.17E-03	2.95E-03
I-710, Del Amo to Long Beach Blvd Interchange	2.55E-01	4.84E-04	1.87E-02	5.10E-03	7.78E-04	3.75E-02	4.00E-04	7.65E-05	3.77E-03	6.62E-03	1.48E-04	3.76E-03	2.65E-03
I-710, Long Beach Boulevard to SR-91	3.00E-01	5.70E-04	2.21E-02	6.00E-03	9.15E-04	4.41E-02	4.71E-04	9.00E-05	4.43E-03	7.79E-03	1.74E-04	4.42E-03	3.12E-03
PCH, I-110 to Alameda	2.65E-01	5.03E-04	1.95E-02	5.30E-03	8.08E-04	3.90E-02	4.16E-04	7.94E-05	3.91E-03	6.88E-03	1.54E-04	3.90E-03	2.76E-03
PCH, Alameda to SR-103	4.94E-02	9.39E-05	3.63E-03	9.89E-04	1.51E-04	7.27E-03	7.76E-05	1.48E-05	7.30E-04	1.28E-03	2.87E-05	7.28E-04	5.14E-04
PCH, SR-103 to I-710	6.48E-02	1.23E-04	4.76E-03	1.30E-03	1.98E-04	9.53E-03	1.02E-04	1.94E-05	9.57E-04	1.68E-03	3.76E-05	9.54E-04	6.74E-04
Sepulveda, I-110 to Avalon	6.20E-02	1.18E-04	4.56E-03	1.24E-03	1.89E-04	9.12E-03	9.73E-05	1.86E-05	9.16E-04	1.61E-03	3.60E-05	9.13E-04	6.45E-04
Sepulveda, Avalon to Alameda	8.47E-02	1.61E-04	6.23E-03	1.70E-03	2.58E-04	1.25E-02	1.33E-04	2.54E-05	1.25E-03	2.20E-03	4.91E-05	1.25E-03	8.82E-04
Sepulveda, Alameda to ICTF	1.95E-02	3.70E-05	1.43E-03	3.90E-04	5.94E-05	2.87E-03	3.06E-05	5.84E-06	2.88E-04	5.06E-04	1.13E-05	2.87E-04	2.03E-04
Sepulveda, ICTF to SR-103	4.16E-03	7.91E-06	3.06E-04	8.33E-05	1.27E-05	6.12E-04	6.53E-06	1.25E-06	6.15E-05	1.08E-04	2.41E-06	6.13E-05	4.33E-05
Del Amo, I-110 to Wilmington	1.81E-01	3.43E-04	1.33E-02	3.61E-03	5.51E-04	2.66E-02	2.83E-04	5.42E-05	2.67E-03	4.69E-03	1.05E-04	2.66E-03	1.88E-03
Del Amo, Wilminton to Alameda	8.14E-02	1.55E-04	5.98E-03	1.63E-03	2.48E-04	1.20E-02	1.28E-04	2.44E-05	1.20E-03	2.11E-03	4.72E-05	1.20E-03	8.47E-04
Del Amo, Alameda to I-710	7.15E-02	1.36E-04	5.26E-03	1.43E-03	2.18E-04	1.05E-02	1.12E-04	2.15E-05	1.06E-03	1.86E-03	4.15E-05	1.05E-03	7.45E-04
223rd Street, I-110 to Avalon	7.07E-02	1.34E-04	5.20E-03	1.41E-03	2.16E-04	1.04E-02	1.11E-04	2.12E-05	1.04E-03	1.84E-03	4.10E-05	1.04E-03	7.36E-04
223rd Street, Avalon to Wilmington	5.71E-02	1.08E-04	4.20E-03	1.14E-03	1.74E-04	8.40E-03	8.96E-05	1.71E-05	8.43E-04	1.48E-03	3.31E-05	8.41E-04	5.94E-04
223rd Street, Wilmington to Alameda	6.63E-02	1.26E-04	4.87E-03	1.33E-03	2.02E-04	9.75E-03	1.04E-04	1.99E-05	9.79E-04	1.72E-03	3.84E-05	9.76E-04	6.90E-04
W Wardlow from Alameda to I-710	1.15E-01	2.19E-04	8.47E-03	2.30E-03	3.51E-04	1.69E-02	1.81E-04	3.45E-05	1.70E-03	2.99E-03	6.68E-05	1.70E-03	1.20E-03

Table B-9
2015 Alternative 2
Maximum Hourly Truck Emissions

	SCAG Diesel Truck Exhaust Emissions																	
	DPM	Ammonia	Antimony	Arsenic	Bromine	Bromine	Cadmium	Chlorine	Chromium (hex)	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Sulfates	Vanadium	Zinc
		7664417	7440360	7440382	7726956	7726956	7440439	7782505	18540299	7440508	7439921	7439965	7439976	7440020	7782492	9960	7440622	7440666
2015, Alternative 2	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	1.88E-03	6.33E-06	6.76E-08	9.39E-09	3.38E-08	3.38E-08	7.51E-08	6.46E-07	1.13E-09	4.70E-08	7.89E-08	7.51E-08	5.63E-08	3.57E-08	1.88E-08	3.27E-05	5.45E-08	8.23E-07
Henry Ford Ramps	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Henry Ford n/o Ramps to Alameda	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	2.56E-03	8.63E-06	9.22E-08	1.28E-08	4.61E-08	4.61E-08	1.02E-07	8.81E-07	1.54E-09	6.40E-08	1.08E-07	1.02E-07	7.68E-08	4.87E-08	2.56E-08	4.46E-05	7.43E-08	1.12E-06
SR-103 Anaheim to PCH	3.63E-03	1.22E-05	1.31E-07	1.82E-08	6.54E-08	6.54E-08	1.45E-07	1.25E-06	2.18E-09	9.08E-08	1.53E-07	1.45E-07	1.09E-07	6.90E-08	3.63E-08	6.32E-05	1.05E-07	1.59E-06
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	4.83E-03	1.63E-05	1.74E-07	2.42E-08	8.70E-08	8.70E-08	1.93E-07	1.66E-06	2.90E-09	1.21E-07	2.03E-07	1.93E-07	1.45E-07	9.18E-08	4.83E-08	8.41E-05	1.40E-07	2.12E-06
SR-103 Ramps south of Sepulveda/Willow																		
NB Sepulveda Ramp (G2 Line)	1.31E-03	4.43E-06	4.73E-08	6.57E-09	2.37E-08	2.37E-08	5.26E-08	4.52E-07	7.88E-10	3.29E-08	5.52E-08	5.26E-08	3.94E-08	2.50E-08	1.31E-08	2.29E-05	3.81E-08	5.76E-07
SB Sepulveda Ramp (F2 Ramp)	9.25E-04	3.12E-06	3.33E-08	4.62E-09	1.66E-08	1.66E-08	3.70E-08	3.18E-07	5.55E-10	2.31E-08	3.88E-08	3.70E-08	2.77E-08	1.76E-08	9.25E-09	1.61E-05	2.68E-08	4.05E-07
SR-103 Existing, End Ramps to Sepulveda/Willow																		
SB Sepulveda Ramp Traffic	1.70E-04	5.74E-07	6.13E-09	8.52E-10	3.07E-09	3.07E-09	6.81E-09	5.86E-08	1.02E-10	4.26E-09	7.15E-09	6.81E-09	5.11E-09	3.24E-09	1.70E-09	2.96E-06	4.94E-09	7.46E-08
SB+NB Sepulveda Ramp Traffic	6.69E-04	2.25E-06	2.41E-08	3.35E-09	1.20E-08	1.20E-08	2.68E-08	2.30E-07	4.02E-10	1.67E-08	2.81E-08	2.68E-08	2.01E-08	1.27E-08	6.69E-09	1.16E-05	1.94E-08	2.93E-07
SR-103, Realignment to End (223rd/Wardlow)	7.50E-03	2.53E-05	2.70E-07	3.75E-08	1.35E-07	1.35E-07	3.00E-07	2.58E-06	4.50E-09	1.88E-07	3.15E-07	3.00E-07	2.25E-07	1.43E-07	7.50E-08	1.31E-04	2.18E-07	3.29E-06
E and W Harry Bridges, Figueroa to start Alameda	2.30E-03	7.74E-06	8.27E-08	1.15E-08	4.14E-08	4.14E-08	9.19E-08	7.91E-07	1.38E-09	5.75E-08	9.65E-08	9.19E-08	6.89E-08	4.37E-08	2.30E-08	4.00E-05	6.66E-08	1.01E-06
Alameda beginning (E Harry Bridges) to Anaheim	4.43E-03	1.49E-05	1.60E-07	2.22E-08	7.98E-08	7.98E-08	1.77E-07	1.52E-06	2.66E-09	1.11E-07	1.86E-07	1.77E-07	1.33E-07	8.42E-08	4.43E-08	7.71E-05	1.29E-07	1.94E-06
Alameda Anaheim to Henry Ford	2.84E-03	9.57E-06	1.02E-07	1.42E-08	5.12E-08	5.12E-08	1.14E-07	9.78E-07	1.71E-09	7.10E-08	1.19E-07	1.14E-07	8.53E-08	5.40E-08	2.84E-08	4.94E-05	8.24E-08	1.24E-06
Alameda, Henry Ford to PCH	2.36E-03	7.94E-06	8.48E-08	1.18E-08	4.24E-08	4.24E-08	9.43E-08	8.11E-07	1.41E-09	5.89E-08	9.90E-08	9.43E-08	7.07E-08	4.48E-08	2.36E-08	4.10E-05	6.83E-08	1.03E-06
Alameda PCH to 405	5.22E-02	1.76E-04	1.88E-06	2.61E-07	9.39E-07	9.39E-07	2.09E-06	1.80E-05	3.13E-08	1.30E-06	2.19E-06	2.09E-06	1.57E-06	9.91E-07	5.22E-07	9.08E-04	1.51E-06	2.29E-05
Alameda 405 to del Amo	4.57E-02	1.54E-04	1.64E-06	2.28E-07	8.22E-07	8.22E-07	1.83E-06	1.57E-05	2.74E-08	1.14E-06	1.92E-06	1.83E-06	1.37E-06	8.67E-07	4.57E-07	7.94E-04	1.32E-06	2.00E-05
Alameda, del Amo to South Santa Fe Avenue	1.92E-02	6.49E-05	6.93E-07	9.62E-08	3.46E-07	3.46E-07	7.70E-07	6.62E-06	1.15E-08	4.81E-07	8.08E-07	7.70E-07	5.77E-07	3.66E-07	1.92E-07	3.35E-04	5.58E-07	8.43E-06
Alameda, South Santa Fe Avenue to SR-91	1.80E-02	6.08E-05	6.49E-07	9.02E-08	3.25E-07	3.25E-07	7.21E-07	6.20E-06	1.08E-08	4.51E-07	7.58E-07	7.21E-07	5.41E-07	3.43E-07	1.80E-07	3.14E-04	5.23E-07	7.90E-06
I-110, "C" Street Interchange to Anaheim	1.67E-02	5.64E-05	6.03E-07	8.37E-08	3.01E-07	3.01E-07	6.70E-07	5.76E-06	1.00E-08	4.18E-07	7.03E-07	6.70E-07	5.02E-07	3.18E-07	1.67E-07	2.91E-04	4.85E-07	7.33E-06
I-110, Anaheim to PCH	3.52E-02	1.19E-04	1.27E-06	1.76E-07	6.34E-07	6.34E-07	1.41E-06	1.21E-05	2.11E-08	8.81E-07	1.48E-06	1.41E-06	1.06E-06	6.69E-07	3.52E-07	6.13E-04	1.02E-06	1.54E-05
1-110, PCH to Sepulveda	7.67E-02	2.58E-04	2.76E-06	3.83E-07	1.38E-06	1.38E-06	3.07E-06	2.64E-05	4.60E-08	1.92E-06	3.22E-06	3.07E-06	2.30E-06	1.46E-06	7.67E-07	1.33E-03	2.22E-06	3.36E-05
I-110, Sepulveda to Carson	1.09E-01	3.68E-04	3.93E-06	5.45E-07	1.96E-06	1.96E-06	4.36E-06	3.75E-05	6.55E-08	2.73E-06	4.58E-06	4.36E-06	3.27E-06	2.07E-06	1.09E-06	1.90E-03	3.16E-06	4.78E-05
I-110, Carson to Del Amo	8.27E-02	2.79E-04	2.98E-06	4.14E-07	1.49E-06	1.49E-06	3.31E-06	2.85E-05	4.96E-08	2.07E-06	3.47E-06	3.31E-06	2.48E-06	1.57E-06	8.27E-07	1.44E-03	2.40E-06	3.62E-05
I-110, Del Amo to 405	7.07E-02	2.38E-04	2.55E-06	3.54E-07	1.27E-06	1.27E-06	2.83E-06	2.43E-05	4.24E-08	1.77E-06	2.97E-06	2.83E-06	2.12E-06	1.34E-06	7.07E-07	1.23E-03	2.05E-06	3.10E-05
I-110, 405 to SR-91	1.59E-01	5.36E-04	5.73E-06	7.95E-07	2.86E-06	2.86E-06	6.36E-06	5.47E-05	9.55E-08	3.98E-06	6.68E-06	6.36E-06	4.77E-06	3.02E-06	1.59E-06	2.77E-03	4.61E-06	6.97E-05
I-710, Anaheim to PCH	1.61E-02	5.43E-05	5.80E-07	8.06E-08	2.90E-07	2.90E-07	6.45E-07	5.55E-06	9.67E-09	4.03E-07	6.77E-07	6.45E-07	4.84E-07	3.06E-07	1.61E-07	2.81E-04	4.68E-07	7.06E-06
I-710, PCH to Willow	3.71E-02	1.25E-04	1.34E-06	1.86E-07	6.68E-07	6.68E-07	1.48E-06	1.28E-05	2.23E-08	9.28E-07	1.56E-06	1.48E-06	1.11E-06	7.05E-07	3.71E-07	6.46E-04	1.08E-06	1.63E-05
I-710, Willow to 405	5.89E-02	1.98E-04	2.12E-06	2.94E-07	1.06E-06	1.06E-06	2.36E-06	2.03E-05	3.53E-08	1.47E-06	2.47E-06	2.36E-06	1.77E-06	1.12E-06	5.89E-07	1.02E-03	1.71E-06	2.58E-05
I-710, 405 to Del Amo	8.84E-02	2.98E-04	3.18E-06	4.42E-07	1.59E-06	1.59E-06	3.54E-06	3.04E-05	5.31E-08	2.21E-06	3.71E-06	3.54E-06	2.65E-06	1.68E-06	8.84E-07	1.54E-03	2.57E-06	3.87E-05
I-710, Del Amo to Long Beach Blvd Interchange	7.96E-02	2.68E-04	2.87E-06	3.98E-07	1.43E-06	1.43E-06	3.18E-06	2.74E-05	4.78E-08	1.99E-06	3.34E-06	3.18E-06	2.39E-06	1.51E-06	7.96E-07	1.39E-03	2.31E-06	3.49E-05
I-710, Long Beach Boulevard to SR-91	9.37E-02	3.16E-04	3.37E-06	4.68E-07	1.69E-06	1.69E-06	3.75E-06	3.22E-05	5.62E-08	2.34E-06	3.93E-06	3.75E-06	2.81E-06	1.78E-06	9.37E-07	1.63E-03	2.72E-06	4.10E-05
PCH, I-110 to Alameda	4.68E-02	1.58E-04	1.68E-06	2.34E-07	8.42E-07	8.42E-07	1.87E-06	1.61E-05	2.81E-08	1.17E-06	1.96E-06	1.87E-06	1.40E-06	8.89E-07	4.68E-07	8.14E-04	1.36E-06	2.05E-05
PCH, Alameda to SR-103	8.73E-03	2.94E-05	3.14E-07	4.36E-08	1.57E-07	1.57E-07	3.49E-07	3.00E-06	5.24E-09	2.18E-07	3.67E-07	3.49E-07	2.62E-07	1.66E-07	8.73E-08	1.52E-04	2.53E-07	3.82E-06
PCH, SR-103 to I-710	1.14E-02	3.86E-05	4.12E-07	5.72E-08	2.06E-07	2.06E-07	4.58E-07	3.94E-06	6.87E-09	2.86E-07	4.81E-07	4.58E-07	3.43E-07	2.17E-07	1.14E-07	1.99E-04	3.32E-07	5.01E-06
Sepulveda, I-110 to Avalon	1.21E-02	4.09E-05	4.37E-07	6.07E-08	2.18E-07	2.18E-07	4.85E-07	4.17E-06	7.28E-09	3.03E-07	5.10E-07	4.85E-07	3.64E-07	2.31E-07	1.21E-07	2.11E-04	3.52E-07	5.31E-06
Sepulveda, Avalon to Alameda	1.66E-02	5.59E-05	5.97E-07	8.29E-08	2.99E-07	2.99E-07	6.63E-07	5.70E-06	9.95E-09	4.15E-07	6.97E-07	6.63E-07	4.98E-07	3.15E-07	1.66E-07	2.89E-04	4.81E-07	7.26E-06
Sepulveda, Alameda to ICTF	3.81E-03	1.28E-05	1.37E-07	1.91E-08	6.86E-08	6.86E-08	1.52E-07	1.31E-06	2.29E-09	9.53E-08	1.60E-07	1.52E-07	1.14E-07	7.24E-08	3.81E-08	6.63E-05	1.11E-07	1.67E-06
Sepulveda, ICTF to SR-103	8.14E-04	2.74E-06	2.93E-08	4.07E-09	1.47E-08	1.47E-08	3.26E-08	2.80E-07	4.89E-10	2.04E-08	3.42E-08	3.26E-08	2.44E-08	1.55E-08	8.14E-09	1.42E-05	2.36E-08	3.57E-07
Del Amo, I-110 to Wilmington	3.53E-02	1.19E-04	1.27E-06	1.77E-07	6.36E-07	6.36E-07	1.41E-06	1.22E-05	2.12E-08	8.84E-07	1.48E-06	1.41E-06	1.06E-06	6.72E-07	3.53E-07	6.15E-04	1.02E-06	1.55E-05
Del Amo, Wilminton to Alameda	1.59E-02	5.37E-05	5.73E-07	7.96E-08	2.87E-07	2.87E-07	6.37E-07	5.48E-06	9.56E-09	3.98E-07	6.69E-07	6.37E-07	4.78E-07	3.03E-07	1.59E-07	2.77E-04	4.62E-07	6.98E-06
Del Amo, Alameda to I-710	1.40E-02	4.72E-05	5.04E-07	7.00E-08	2.52E-07	2.52E-07	5.60E-07	4.82E-06	8.40E-09	3.50E-07	5.88E-07	5.60E-07	4.20E-07	2.66E-07	1.40E-07	2.44E-04	4.06E-07	6.13E-06
223rd Street, I-110 to Avalon	1.38E-02	4.66E-05	4.98E-07	6.92E-08	2.49E-07	2.49E-07	5.53E-07	4.76E-06	8.30E-09	3.46E-07	5.81E-07	5.53E-07	4.15E-07	2.63E-07	1.38E-07	2.41E-04	4.01E-07	6.06E-06
223rd Street, Avalon to Wilmington	1.12E-02	3.76E-05	4.02E-07	5.59E-08	2.01E-07	2.01E-07	4.47E-07	3.84E-06	6.71E-09	2.79E-07	4.69E-07	4.47E-07	3.35E-07	2.12E-07	1.12E-07	1.94E-04	3.24E-07	4.89E-06
223rd Street, Wilmington to Alameda	1.30E-02	4.37E-05	4.67E-07	6.49E-08	2.34E-07	2.34E-07	5.19E-07	4.46E-06	7.78E-09	3.24E-07	5.45E-07	5.19E-07	3.89E-07	2.46E-07	1.30E-07	2.26E-04	3.76E-07	5.68E-06
W Wardlow from Alameda to I-710	2.25E-02	7.59E-05	8.11E-07	1.13E-07	4.06E-07	4.06E-07	9.02E-07	7.75E-06	1.35E-08	5.63E-07	9.47E-07	9.02E-07	6.76E-07	4.28E-07	2.25E-07	3.92E-04	6.54E-07	9.87E-06

Table B-10
2030 No Build
Maximum Hourly Truck Emissions

	Length	Cong Speed	Port Peak Hour trucks	SCAG Peak Hour trucks	Port Peak hr LNG trucks	Port Peak hr Dsl/Alt trucks	SCAG Peak hr Gas trucks	SCAG Peak hr Dsl trucks
Baseline 2030	mile	mph	veh/hr	veh/hr	veh/hr	veh/hr	veh/hr	veh/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	0.75	40	3030	4	730	2300	2	2
Henry Ford Ramps	0.15	10	1132	0	338	794	0	0
Henry Ford n/o Ramps to Alameda	0.68	10	1289	17	351	938	9	8
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	0.95	40	1898	4	391	1507	2	2
SR-103 Anaheim to PCH	0.57	40	1984	29	391	1593	15	14
SR-103 PCH to Sepulveda/Willow	1.02	40	945	30	193	752	16	14
E and W Harry Bridges, Figueroa to start Alameda	1.44	25	561	35	167	394	18	17
Alameda beginning (E Harry Bridges) to Anaheim	0.77	25	618	52	210	408	27	25
Alameda Anaheim to Henry Ford	0.42	25	382	51	135	247	26	25
Alameda Henry Ford to PCH	0.34	25	1427	50	456	971	26	24
Alameda PCH to 405	2.27	30	1638	225	497	1141	117	108
Alameda 405 to del Amo	1.72	30	1330	235	340	990	122	113
Alameda, del Amo to South Santa Fe Avenue	0.84	30	1099	223	238	861	116	107
Alameda, South Santa Fe Avenue to SR-91	1.15	30	775	153	175	600	79	74
I-110, "C" Street Interchange to Anaheim	0.49	45	1906	326	618	1288	169	157
I-110, Anaheim to PCH	0.80	45	1883	358	621	1262	186	172
1-110, PCH to Sepulveda	1.39	45	1915	456	620	1295	237	219
I-110, Sepulveda to Carson	1.56	45	1787	644	579	1208	334	310
I-110, Carson to Del Amo	1.02	45	1694	680	552	1142	353	327
I-110, Del Amo to 405	0.74	45	1625	851	535	1090	442	409
I-110, 405 to SR-91	1.09	45	1391	1316	450	941	683	633
I-710, Anaheim to PCH	0.50	40	4676	237	1316	3360	123	114
I-710, PCH to Willow	1.01	40	4854	257	1410	3444	133	124
I-710, Willow to 405	1.52	40	4832	270	1403	3429	140	130
I-710, 405 to Del Amo	1.42	40	4402	462	1278	3124	240	222
I-710, Del Amo to Long Beach Blvd Interchange	1.17	40	4286	489	1244	3042	254	235
I-710, Long Beach Boulevard to SR-91	0.96	40	4230	834	1233	2997	433	401
PCH, I110 to Alameda	2.38	20	238	170	69	169	88	82
PCH, Alameda to SR-103	0.94	20	373	84	60	313	44	40
PCH, SR-103 to I-710	0.98	20	958	69	264	694	36	33
Sepulveda, I-110 to Avalon	1.37	25	69	98	20	49	51	47
Sepulveda, Avalon to Alameda	1.70	25	160	112	36	124	58	54
Sepulveda, Alameda to ICTF	0.67	25	486	27	109	377	14	13
Sepulveda, ICTF to SR-103	0.17	25	945	22	193	752	11	11
Del Amo, I-110 to Wilmington	2.96	25	70	117	12	58	61	56
Del Amo, Wilminton to Alameda	0.77	25	119	188	43	76	98	90
Del Amo, Alameda to I-710	0.87	25	110	198	34	76	103	95
223rd Street, I-110 to Avalon	1.36	25	17	94	3	14	49	45
223rd Street, Avalon to Wilmington	1.23	25	11	92	2	9	48	44
223rd Street, Wilmington to Alameda	0.79	25	90	178	37	53	92	86
W Wardlow from Alameda to I-710	1.30	25	140	197	10	130	102	95

Table B-10
2030 No Build
Maximum Hourly Truck Emissions

	Port - LNG Trucks				Port - Diesel Trucks		SCAG Gasoline Trucks	SCAG - Diesel Trucks	
	LNG Exhst TOG	LNG Exhst Dsl TOG	LNG Exhst PM	LNG Exhst DPM	Dsl Exhst TOG	Dsl Exhst PM	TOG	Dsl Exhst TOG	Dsl Exhst PM
Baseline 2030	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi
SR-47 Mainline, New Dock Ramps to HF Ramps	0.4890	0.0257	0.1114	0.0059	0.252	0.052	0.027	0.192	0.049
Henry Ford Ramps	0.4890	0.0257	2.0000	3.0000	1.531	0.055	0.142	1.052	0.081
Henry Ford n/o Ramps to Alameda	0.4890	0.0257	0.1114	0.0059	1.531	0.055	0.142	1.052	0.081
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	0.4890	0.0257	0.1114	0.0059	0.252	0.052	0.027	0.192	0.049
SR-103 Anaheim to PCH	0.4890	0.0257	0.1114	0.0059	0.252	0.052	0.027	0.192	0.049
SR-103 PCH to Sepulveda/Willow	0.4890	0.0257	0.1114	0.0059	0.252	0.052	0.027	0.192	0.049
E and W Harry Bridges, Figueroa to start Alameda	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
Alameda beginning (E Harry Bridges) to Anaheim	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
Alameda Anaheim to Henry Ford	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
Alameda Henry Ford to PCH	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
Alameda PCH to 405	0.4890	0.0257	0.1114	0.0059	0.328	0.046	0.040	0.250	0.050
Alameda 405 to del Amo	0.4890	0.0257	0.1114	0.0059	0.328	0.046	0.040	0.250	0.050
Alameda, del Amo to South Santa Fe Avenue	0.4890	0.0257	0.1114	0.0059	0.328	0.046	0.040	0.250	0.050
Alameda, South Santa Fe Avenue to SR-91	0.4890	0.0257	0.1114	0.0059	0.328	0.046	0.040	0.250	0.050
I-110, "C" Street Interchange to Anaheim	0.4890	0.0257	0.1114	0.0059	0.223	0.058	0.024	0.172	0.051
I-110, Anaheim to PCH	0.4890	0.0257	0.1114	0.0059	0.223	0.058	0.024	0.172	0.051
1-110, PCH to Sepulveda	0.4890	0.0257	0.1114	0.0059	0.223	0.058	0.024	0.172	0.051
I-110, Sepulveda to Carson	0.4890	0.0257	0.1114	0.0059	0.223	0.058	0.024	0.172	0.051
I-110, Carson to Del Amo	0.4890	0.0257	0.1114	0.0059	0.223	0.058	0.024	0.172	0.051
I-110, Del Amo to 405	0.4890	0.0257	0.1114	0.0059	0.223	0.058	0.024	0.172	0.051
I-110, 405 to SR-91	0.4890	0.0257	0.1114	0.0059	0.223	0.058	0.024	0.172	0.051
I-710, Anaheim to PCH	0.4890	0.0257	0.1114	0.0059	0.252	0.052	0.027	0.192	0.049
I-710, PCH to Willow	0.4890	0.0257	0.1114	0.0059	0.252	0.052	0.027	0.192	0.049
I-710, Willow to 405	0.4890	0.0257	0.1114	0.0059	0.252	0.052	0.027	0.192	0.049
I-710, 405 to Del Amo	0.4890	0.0257	0.1114	0.0059	0.252	0.052	0.027	0.192	0.049
I-710, Del Amo to Long Beach Blvd Interchange	0.4890	0.0257	0.1114	0.0059	0.252	0.052	0.027	0.192	0.049
I-710, Long Beach Boulevard to SR-91	0.4890	0.0257	0.1114	0.0059	0.252	0.052	0.027	0.192	0.049
PCH, I110 to Alameda	0.4890	0.0257	0.1114	0.0059	0.431	0.046	0.069	0.333	0.059
PCH, Alameda to SR-103	0.4890	0.0257	0.1114	0.0059	0.431	0.046	0.069	0.333	0.059
PCH, SR-103 to I-710	0.4890	0.0257	0.1114	0.0059	0.431	0.046	0.069	0.333	0.059
Sepulveda, I-110 to Avalon	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
Sepulveda, Avalon to Alameda	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
Sepulveda, Alameda to ICTF	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
Sepulveda, ICTF to SR-103	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
Del Amo, I-110 to Wilmington	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
Del Amo, Wilminton to Alameda	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
Del Amo, Alameda to I-710	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
223rd Street, I-110 to Avalon	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
223rd Street, Avalon to Wilmington	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
223rd Street, Wilmington to Alameda	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
W Wardlow from Alameda to I-710	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053

Table B-10
2030 No Build
Maximum Hourly Truck Emissions

	Port		Port		SCAG	SCAG	
	LNG TOG	LNG PM	Dsl + LNG Dsl TOG	Dsl + LNG DPM	Gasoline TOG	Dsl Exhst TOG	Dsl Exhst PM
Baseline 2030	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	0.587	0.134	0.98	0.20	0.00	0.00	0.00
Henry Ford Ramps	0.055	0.226	0.41	0.35	0.00	0.00	0.00
Henry Ford n/o Ramps to Alameda	0.259	0.059	2.18	0.08	0.00	0.01	0.00
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	0.400	0.091	0.81	0.17	0.00	0.00	0.00
SR-103 Anaheim to PCH	0.242	0.055	0.52	0.11	0.00	0.00	0.00
SR-103 PCH to Sepulveda/Willow	0.212	0.048	0.44	0.09	0.00	0.01	0.00
E and W Harry Bridges, Figueroa to start Alameda	0.260	0.059	0.48	0.06	0.00	0.02	0.00
Alameda beginning (E Harry Bridges) to Anaheim	0.174	0.040	0.27	0.03	0.00	0.01	0.00
Alameda Anaheim to Henry Ford	0.061	0.014	0.09	0.01	0.00	0.01	0.00
Alameda Henry Ford to PCH	0.169	0.038	0.29	0.04	0.00	0.01	0.00
Alameda PCH to 405	1.215	0.277	1.93	0.27	0.02	0.14	0.03
Alameda 405 to del Amo	0.630	0.144	1.27	0.18	0.02	0.11	0.02
Alameda, del Amo to South Santa Fe Avenue	0.215	0.049	0.53	0.08	0.01	0.05	0.01
Alameda, South Santa Fe Avenue to SR-91	0.218	0.050	0.51	0.07	0.01	0.05	0.01
I-110, "C" Street Interchange to Anaheim	0.328	0.075	0.33	0.08	0.00	0.03	0.01
I-110, Anaheim to PCH	0.538	0.123	0.53	0.14	0.01	0.05	0.02
1-110, PCH to Sepulveda	0.927	0.211	0.93	0.24	0.02	0.12	0.03
I-110, Sepulveda to Carson	0.972	0.221	0.98	0.25	0.03	0.18	0.05
I-110, Carson to Del Amo	0.608	0.138	0.61	0.16	0.02	0.13	0.04
I-110, Del Amo to 405	0.427	0.097	0.42	0.11	0.02	0.12	0.03
I-110, 405 to SR-91	0.531	0.121	0.53	0.14	0.04	0.26	0.08
I-710, Anaheim to PCH	0.708	0.161	0.97	0.20	0.00	0.02	0.01
I-710, PCH to Willow	1.528	0.348	2.00	0.42	0.01	0.05	0.01
I-710, Willow to 405	2.304	0.525	3.02	0.63	0.01	0.08	0.02
I-710, 405 to Del Amo	1.956	0.446	2.57	0.53	0.02	0.13	0.03
I-710, Del Amo to Long Beach Blvd Interchange	1.574	0.359	2.07	0.43	0.02	0.12	0.03
I-710, Long Beach Boulevard to SR-91	1.277	0.291	1.67	0.35	0.02	0.16	0.04
PCH, I110 to Alameda	0.176	0.040	0.39	0.04	0.03	0.14	0.03
PCH, Alameda to SR-103	0.061	0.014	0.28	0.03	0.01	0.03	0.00
PCH, SR-103 to I-710	0.280	0.064	0.66	0.07	0.01	0.02	0.00
Sepulveda, I-110 to Avalon	0.030	0.007	0.06	0.01	0.01	0.04	0.01
Sepulveda, Avalon to Alameda	0.065	0.015	0.18	0.02	0.01	0.06	0.01
Sepulveda, Alameda to ICTF	0.079	0.018	0.21	0.03	0.00	0.01	0.00
Sepulveda, ICTF to SR-103	0.036	0.008	0.11	0.01	0.00	0.00	0.00
Del Amo, I-110 to Wilmington	0.037	0.008	0.15	0.02	0.02	0.11	0.02
Del Amo, Wilminton to Alameda	0.036	0.008	0.05	0.01	0.01	0.04	0.01
Del Amo, Alameda to I-710	0.032	0.007	0.06	0.01	0.01	0.05	0.01
223rd Street, I-110 to Avalon	0.004	0.001	0.02	0.00	0.01	0.04	0.01
223rd Street, Avalon to Wilmington	0.002	0.000	0.01	0.00	0.01	0.03	0.01
223rd Street, Wilmington to Alameda	0.031	0.007	0.04	0.00	0.01	0.04	0.01
W Wardlow from Alameda to I-710	0.015	0.003	0.14	0.02	0.01	0.08	0.01

Table B-10
2030 No Build
Maximum Hourly Truck Emissions

	Maximum Hourly Toxic Emissions from Trucks														
	DPM	Acetaldehyde	Acrolein	Ammonia	Antimony	Arsenic	Benzene	Bromine	1,3-Butadiene	Cadmium	Chlorine	Chromium (hex)	Copper	Ethylbenzene	Formaldehyde
	9901	75070	107028	7664417	7440360	7440382	71432	7726956	106990	7440439	7782505	18540299	7440508	100414	50000
Baseline 2030	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr		lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	2.04E-01	7.24E-02	1.04E-07	6.87E-04	7.34E-06	1.02E-06	1.97E-02	7.34E-06	1.87E-03	8.15E-06	7.01E-05	1.22E-07	5.09E-06	3.00E-03	1.45E-01
Henry Ford Ramps	3.54E-01	3.01E-02	0.00E+00	1.19E-03	1.27E-05	1.77E-06	8.18E-03	1.27E-05	7.77E-04	1.42E-05	1.22E-04	2.12E-07	8.85E-06	1.25E-03	6.02E-02
Henry Ford n/o Ramps to Alameda	8.23E-02	1.61E-01	2.14E-06	2.77E-04	2.96E-06	4.12E-07	4.39E-02	2.96E-06	4.18E-03	3.29E-06	2.83E-05	4.94E-08	2.06E-06	6.69E-03	3.23E-01
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.69E-01	5.99E-02	1.32E-07	5.68E-04	6.07E-06	8.43E-07	1.63E-02	6.07E-06	1.55E-03	6.75E-06	5.80E-05	1.01E-07	4.22E-06	2.49E-03	1.20E-01
SR-103 Anaheim to PCH	1.09E-01	3.85E-02	5.81E-07	3.66E-04	3.91E-06	5.43E-07	1.05E-02	3.91E-06	9.97E-04	4.34E-06	3.73E-05	6.51E-08	2.71E-06	1.60E-03	7.71E-02
SR-103 PCH to Sepulveda/Willow	9.19E-02	3.26E-02	1.07E-06	3.10E-04	3.31E-06	4.59E-07	8.88E-03	3.31E-06	8.46E-04	3.68E-06	3.16E-05	5.51E-08	2.30E-06	1.35E-03	6.52E-02
E and W Harry Bridges, Figueroa to start Alameda	6.22E-02	3.68E-02	3.33E-06	2.09E-04	2.24E-06	3.11E-07	1.01E-02	2.24E-06	9.64E-04	2.49E-06	2.14E-05	3.73E-08	1.55E-06	1.53E-03	7.37E-02
Alameda beginning (E Harry Bridges) to Anaheim	3.54E-02	2.07E-02	2.64E-06	1.19E-04	1.27E-06	1.77E-07	5.69E-03	1.27E-06	5.46E-04	1.42E-06	1.22E-05	2.12E-08	8.85E-07	8.59E-04	4.15E-02
Alameda Anaheim to Henry Ford	1.23E-02	7.08E-03	1.42E-06	4.13E-05	4.41E-07	6.13E-08	1.95E-03	4.41E-07	1.89E-04	4.90E-07	4.22E-06	7.35E-09	3.06E-07	2.94E-04	1.42E-02
Alameda Henry Ford to PCH	3.60E-02	2.14E-02	1.13E-06	1.21E-04	1.30E-06	1.80E-07	5.84E-03	1.30E-06	5.57E-04	1.44E-06	1.24E-05	2.16E-08	9.00E-07	8.87E-04	4.28E-02
Alameda PCH to 405	3.01E-01	1.52E-01	2.64E-05	1.01E-03	1.08E-05	1.50E-06	4.19E-02	1.08E-05	4.04E-03	1.20E-05	1.03E-04	1.81E-07	7.52E-06	6.31E-03	3.05E-01
Alameda 405 to del Amo	2.00E-01	1.01E-01	2.09E-05	6.73E-04	7.20E-06	9.99E-07	2.79E-02	7.20E-06	2.70E-03	7.99E-06	6.88E-05	1.20E-07	5.00E-06	4.19E-03	2.02E-01
Alameda, del Amo to South Santa Fe Avenue	8.51E-02	4.30E-02	9.70E-06	2.87E-04	3.06E-06	4.26E-07	1.19E-02	3.06E-06	1.15E-03	3.40E-06	2.93E-05	5.11E-08	2.13E-06	1.78E-03	8.61E-02
Alameda, South Santa Fe Avenue to SR-91	8.13E-02	4.11E-02	9.13E-06	2.74E-04	2.93E-06	4.06E-07	1.13E-02	2.93E-06	1.10E-03	3.25E-06	2.80E-05	4.88E-08	2.03E-06	1.70E-03	8.23E-02
I-110, "C" Street Interchange to Anaheim	9.33E-02	2.63E-02	4.98E-06	3.14E-04	3.36E-06	4.67E-07	7.25E-03	3.36E-06	7.00E-04	3.73E-06	3.21E-05	5.60E-08	2.33E-06	1.09E-03	5.27E-02
I-110, Anaheim to PCH	1.51E-01	4.26E-02	8.92E-06	5.09E-04	5.44E-06	7.56E-07	1.18E-02	5.44E-06	1.14E-03	6.04E-06	5.20E-05	9.07E-08	3.78E-06	1.77E-03	8.53E-02
1-110, PCH to Sepulveda	2.74E-01	7.70E-02	1.96E-05	9.23E-04	9.86E-06	1.37E-06	2.13E-02	9.86E-06	2.07E-03	1.10E-05	9.42E-05	1.64E-07	6.85E-06	3.19E-03	1.54E-01
I-110, Sepulveda to Carson	3.05E-01	8.53E-02	3.11E-05	1.03E-03	1.10E-05	1.53E-06	2.38E-02	1.10E-05	2.33E-03	1.22E-05	1.05E-04	1.83E-07	7.64E-06	3.54E-03	1.71E-01
I-110, Carson to Del Amo	1.93E-01	5.39E-02	2.16E-05	6.52E-04	6.96E-06	9.67E-07	1.51E-02	6.96E-06	1.48E-03	7.74E-06	6.65E-05	1.16E-07	4.84E-06	2.23E-03	1.08E-01
I-110, Del Amo to 405	1.42E-01	3.94E-02	1.96E-05	4.78E-04	5.11E-06	7.10E-07	1.11E-02	5.11E-06	1.10E-03	5.68E-06	4.88E-05	8.52E-08	3.55E-06	1.63E-03	7.89E-02
I-110, 405 to SR-91	2.15E-01	5.86E-02	4.46E-05	7.23E-04	7.73E-06	1.07E-06	1.68E-02	7.73E-06	1.70E-03	8.59E-06	7.38E-05	1.29E-07	5.37E-06	2.43E-03	1.18E-01
I-710, Anaheim to PCH	2.07E-01	7.31E-02	4.13E-06	6.97E-04	7.45E-06	1.04E-06	2.00E-02	7.45E-06	1.91E-03	8.28E-06	7.12E-05	1.24E-07	5.18E-06	3.03E-03	1.46E-01
I-710, PCH to Willow	4.29E-01	1.51E-01	9.02E-06	1.44E-03	1.54E-05	2.14E-06	4.13E-02	1.54E-05	3.94E-03	1.71E-05	1.47E-04	2.57E-07	1.07E-05	6.27E-03	3.03E-01
I-710, Willow to 405	6.48E-01	2.28E-01	1.44E-05	2.18E-03	2.33E-05	3.24E-06	6.24E-02	2.33E-05	5.96E-03	2.59E-05	2.23E-04	3.89E-07	1.62E-05	9.47E-03	4.57E-01
I-710, 405 to Del Amo	5.66E-01	1.99E-01	2.29E-05	1.91E-03	2.04E-05	2.83E-06	5.45E-02	2.04E-05	5.22E-03	2.26E-05	1.95E-04	3.39E-07	1.41E-05	8.23E-03	3.98E-01
I-710, Del Amo to Long Beach Blvd Interchange	4.58E-01	1.61E-01	2.00E-05	1.54E-03	1.65E-05	2.29E-06	4.41E-02	1.65E-05	4.23E-03	1.83E-05	1.58E-04	2.75E-07	1.14E-05	6.66E-03	3.22E-01
I-710, Long Beach Boulevard to SR-91	3.87E-01	1.35E-01	2.80E-05	1.30E-03	1.39E-05	1.93E-06	3.71E-02	1.39E-05	3.59E-03	1.55E-05	1.33E-04	2.32E-07	9.67E-06	5.58E-03	2.70E-01
PCH, I110 to Alameda	6.83E-02	3.94E-02	3.61E-05	2.30E-04	2.46E-06	3.41E-07	1.14E-02	2.46E-06	1.16E-03	2.73E-06	2.35E-05	4.10E-08	1.71E-06	1.63E-03	7.91E-02
PCH, Alameda to SR-103	3.56E-02	2.29E-02	7.06E-06	1.20E-04	1.28E-06	1.78E-07	6.35E-03	1.28E-06	6.20E-04	1.42E-06	1.22E-05	2.14E-08	8.90E-07	9.48E-04	4.58E-02
PCH, SR-103 to I-710	7.68E-02	5.04E-02	6.04E-06	2.59E-04	2.77E-06	3.84E-07	1.38E-02	2.77E-06	1.33E-03	3.07E-06	2.64E-05	4.61E-08	1.92E-06	2.09E-03	1.01E-01
Sepulveda, I-110 to Avalon	1.45E-02	7.24E-03	8.85E-06	4.89E-05	5.22E-07	7.26E-08	2.13E-03	5.22E-07	2.23E-04	5.80E-07	4.99E-06	8.71E-09	3.63E-07	2.99E-04	1.45E-02
Sepulveda, Avalon to Alameda	3.23E-02	1.74E-02	1.25E-05	1.09E-04	1.16E-06	1.62E-07	4.97E-03	1.16E-06	5.02E-04	1.29E-06	1.11E-05	1.94E-08	8.09E-07	7.22E-04	3.50E-02
Sepulveda, Alameda to ICTF	2.71E-02	1.62E-02	1.20E-06	9.13E-05	9.76E-07	1.36E-07	4.43E-03	9.76E-07	4.24E-04	1.08E-06	9.32E-06	1.63E-08	6.78E-07	6.72E-04	3.24E-02
Sepulveda, ICTF to SR-103	1.34E-02	8.08E-03	2.49E-07	4.51E-05	4.82E-07	6.69E-08	2.20E-03	4.82E-07	2.10E-04	5.35E-07	4.60E-06	8.03E-09	3.35E-07	3.35E-04	1.62E-02
Del Amo, I-110 to Wilmington	3.69E-02	1.85E-02	2.28E-05	1.24E-04	1.33E-06	1.85E-07	5.45E-03	1.33E-06	5.71E-04	1.48E-06	1.27E-05	2.22E-08	9.24E-07	7.65E-04	3.72E-02
Del Amo, Wilminton to Alameda	1.42E-02	6.93E-03	9.49E-06	4.80E-05	5.12E-07	7.12E-08	2.06E-03	5.12E-07	2.18E-04	5.69E-07	4.90E-06	8.54E-09	3.56E-07	2.86E-04	1.39E-02
Del Amo, Alameda to I-710	1.67E-02	8.09E-03	1.14E-05	5.61E-05	5.99E-07	8.33E-08	2.41E-03	5.99E-07	2.55E-04	6.66E-07	5.73E-06	9.99E-09	4.16E-07	3.34E-04	1.63E-02
223rd Street, I-110 to Avalon	9.15E-03	4.09E-03	8.45E-06	3.08E-05	3.29E-07	4.57E-08	1.27E-03	3.29E-07	1.40E-04	3.66E-07	3.15E-06	5.49E-09	2.29E-07	1.69E-04	8.25E-03
223rd Street, Avalon to Wilmington	7.49E-03	3.26E-03	7.43E-06	2.52E-05	2.70E-07	3.74E-08	1.02E-03	2.70E-07	1.14E-04	2.99E-07	2.58E-06	4.49E-09	1.87E-07	1.34E-04	6.58E-03
223rd Street, Wilmington to Alameda	1.24E-02	5.85E-03	9.26E-06	4.18E-05	4.46E-07	6.20E-08	1.76E-03	4.46E-07	1.89E-04	4.96E-07	4.27E-06	7.44E-09	3.10E-07	2.42E-04	1.18E-02
W Wardlow from Alameda to I-710	3.12E-02	1.61E-02	1.69E-05	1.05E-04	1.12E-06	1.56E-07	4.69E-03	1.12E-06	4.85E-04	1.25E-06	1.07E-05	1.87E-08	7.80E-07	6.67E-04	3.24E-02

Table B-10
2030 No Build
Maximum Hourly Truck Emissions

	Maximum Hourly Toxic Emissions from Trucks (continued)														
	n-Hexane	Lead	Manganese	MEK	Mercury	Methanol	Nickel	Propylene	Selenium	Sthrene	Sulfates	Toluene	Vanadium	Xylene	Zinc
	110543	7439921	7439965	78933	7439976	67561	7440020	115071	7782492	100425	9960	108883	7440622	1330207	7440666
Baseline 2030	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	1.55E-03	8.56E-06	8.15E-06	1.45E-02	6.11E-06	2.95E-04	3.87E-06	2.56E-02	2.04E-06	5.71E-04	3.55E-03	1.45E-02	5.91E-06	1.02E-02	8.93E-05
Henry Ford Ramps	6.42E-04	1.49E-05	1.42E-05	6.04E-03	1.06E-05	1.23E-04	6.73E-06	1.06E-02	3.54E-06	2.37E-04	6.16E-03	6.02E-03	1.03E-05	4.26E-03	1.55E-04
Henry Ford n/o Ramps to Alameda	3.44E-03	3.46E-06	3.29E-06	3.24E-02	2.47E-06	6.58E-04	1.56E-06	5.70E-02	8.23E-07	1.27E-03	1.43E-03	3.23E-02	2.39E-06	2.28E-02	3.61E-05
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.28E-03	7.08E-06	6.75E-06	1.20E-02	5.06E-06	2.45E-04	3.20E-06	2.12E-02	1.69E-06	4.73E-04	2.93E-03	1.20E-02	4.89E-06	8.48E-03	7.39E-05
SR-103 Anaheim to PCH	8.22E-04	4.56E-06	4.34E-06	7.74E-03	3.26E-06	1.57E-04	2.06E-06	1.36E-02	1.09E-06	3.04E-04	1.89E-03	7.71E-03	3.15E-06	5.45E-03	4.75E-05
SR-103 PCH to Sepulveda/Willow	6.95E-04	3.86E-06	3.68E-06	6.54E-03	2.76E-06	1.33E-04	1.75E-06	1.15E-02	9.19E-07	2.57E-04	1.60E-03	6.52E-03	2.66E-06	4.61E-03	4.02E-05
E and W Harry Bridges, Figueroa to start Alameda	7.86E-04	2.61E-06	2.49E-06	7.39E-03	1.86E-06	1.50E-04	1.18E-06	1.30E-02	6.22E-07	2.90E-04	1.08E-03	7.37E-03	1.80E-06	5.21E-03	2.72E-05
Alameda beginning (E Harry Bridges) to Anaheim	4.42E-04	1.49E-06	1.42E-06	4.16E-03	1.06E-06	8.45E-05	6.72E-07	7.32E-03	3.54E-07	1.63E-04	6.16E-04	4.15E-03	1.03E-06	2.93E-03	1.55E-05
Alameda Anaheim to Henry Ford	1.51E-04	5.15E-07	4.90E-07	1.42E-03	3.68E-07	2.89E-05	2.33E-07	2.50E-03	1.23E-07	5.58E-05	2.13E-04	1.42E-03	3.55E-07	1.00E-03	5.37E-06
Alameda Henry Ford to PCH	4.57E-04	1.51E-06	1.44E-06	4.30E-03	1.08E-06	8.72E-05	6.84E-07	7.55E-03	3.60E-07	1.69E-04	6.26E-04	4.28E-03	1.04E-06	3.03E-03	1.58E-05
Alameda PCH to 405	3.25E-03	1.26E-05	1.20E-05	3.06E-02	9.03E-06	6.21E-04	5.72E-06	5.37E-02	3.01E-06	1.20E-03	5.23E-03	3.05E-02	8.72E-06	2.15E-02	1.32E-04
Alameda 405 to del Amo	2.16E-03	8.39E-06	7.99E-06	2.03E-02	6.00E-06	4.12E-04	3.80E-06	3.57E-02	2.00E-06	7.96E-04	3.48E-03	2.02E-02	5.80E-06	1.43E-02	8.75E-05
Alameda, del Amo to South Santa Fe Avenue	9.18E-04	3.57E-06	3.40E-06	8.64E-03	2.55E-06	1.75E-04	1.62E-06	1.52E-02	8.51E-07	3.39E-04	1.48E-03	8.61E-03	2.47E-06	6.09E-03	3.73E-05
Alameda, South Santa Fe Avenue to SR-91	8.77E-04	3.41E-06	3.25E-06	8.25E-03	2.44E-06	1.68E-04	1.54E-06	1.45E-02	8.13E-07	3.24E-04	1.41E-03	8.23E-03	2.36E-06	5.81E-03	3.56E-05
I-110, "C" Street Interchange to Anaheim	5.62E-04	3.92E-06	3.73E-06	5.29E-03	2.80E-06	1.07E-04	1.77E-06	9.29E-03	9.33E-07	2.08E-04	1.62E-03	5.27E-03	2.71E-06	3.73E-03	4.09E-05
I-110, Anaheim to PCH	9.09E-04	6.35E-06	6.04E-06	8.55E-03	4.53E-06	1.74E-04	2.87E-06	1.50E-02	1.51E-06	3.36E-04	2.63E-03	8.53E-03	4.38E-06	6.03E-03	6.62E-05
1-110, PCH to Sepulveda	1.64E-03	1.15E-05	1.10E-05	1.55E-02	8.22E-06	3.14E-04	5.20E-06	2.72E-02	2.74E-06	6.07E-04	4.77E-03	1.54E-02	7.94E-06	1.09E-02	1.20E-04
I-110, Sepulveda to Carson	1.82E-03	1.28E-05	1.22E-05	1.71E-02	9.16E-06	3.48E-04	5.80E-06	3.01E-02	3.05E-06	6.72E-04	5.31E-03	1.71E-02	8.86E-06	1.21E-02	1.34E-04
I-110, Carson to Del Amo	1.15E-03	8.12E-06	7.74E-06	1.08E-02	5.80E-06	2.20E-04	3.68E-06	1.90E-02	1.93E-06	4.25E-04	3.37E-03	1.08E-02	5.61E-06	7.63E-03	8.47E-05
I-110, Del Amo to 405	8.39E-04	5.96E-06	5.68E-06	7.90E-03	4.26E-06	1.60E-04	2.70E-06	1.39E-02	1.42E-06	3.10E-04	2.47E-03	7.88E-03	4.12E-06	5.57E-03	6.22E-05
I-110, 405 to SR-91	1.25E-03	9.01E-06	8.59E-06	1.18E-02	6.44E-06	2.39E-04	4.08E-06	2.07E-02	2.15E-06	4.61E-04	3.73E-03	1.17E-02	6.22E-06	8.28E-03	9.40E-05
I-710, Anaheim to PCH	1.56E-03	8.69E-06	8.28E-06	1.47E-02	6.21E-06	2.98E-04	3.93E-06	2.58E-02	2.07E-06	5.76E-04	3.60E-03	1.46E-02	6.00E-06	1.03E-02	9.07E-05
I-710, PCH to Willow	3.23E-03	1.80E-05	1.71E-05	3.04E-02	1.29E-05	6.17E-04	8.14E-06	5.34E-02	4.29E-06	1.19E-03	7.46E-03	3.03E-02	1.24E-05	2.14E-02	1.88E-04
I-710, Willow to 405	4.88E-03	2.72E-05	2.59E-05	4.59E-02	1.94E-05	9.32E-04	1.23E-05	8.07E-02	6.48E-06	1.80E-03	1.13E-02	4.58E-02	1.88E-05	3.23E-02	2.84E-04
I-710, 405 to Del Amo	4.24E-03	2.38E-05	2.26E-05	3.99E-02	1.70E-05	8.10E-04	1.07E-05	7.01E-02	5.66E-06	1.57E-03	9.84E-03	3.98E-02	1.64E-05	2.81E-02	2.48E-04
I-710, Del Amo to Long Beach Blvd Interchange	3.43E-03	1.92E-05	1.83E-05	3.23E-02	1.37E-05	6.55E-04	8.70E-06	5.67E-02	4.58E-06	1.27E-03	7.97E-03	3.22E-02	1.33E-05	2.27E-02	2.01E-04
I-710, Long Beach Boulevard to SR-91	2.87E-03	1.62E-05	1.55E-05	2.70E-02	1.16E-05	5.49E-04	7.35E-06	4.75E-02	3.87E-06	1.06E-03	6.73E-03	2.70E-02	1.12E-05	1.91E-02	1.69E-04
PCH, I110 to Alameda	8.39E-04	2.87E-06	2.73E-06	7.90E-03	2.05E-06	1.60E-04	1.30E-06	1.39E-02	6.83E-07	3.10E-04	1.19E-03	7.87E-03	1.98E-06	5.56E-03	2.99E-05
PCH, Alameda to SR-103	4.88E-04	1.50E-06	1.42E-06	4.59E-03	1.07E-06	9.32E-05	6.77E-07	8.07E-03	3.56E-07	1.80E-04	6.20E-04	4.58E-03	1.03E-06	3.24E-03	1.56E-05
PCH, SR-103 to I-710	1.08E-03	3.23E-06	3.07E-06	1.01E-02	2.31E-06	2.06E-04	1.46E-06	1.78E-02	7.68E-07	3.98E-04	1.34E-03	1.01E-02	2.23E-06	7.14E-03	3.37E-05
Sepulveda, I-110 to Avalon	1.54E-04	6.09E-07	5.80E-07	1.45E-03	4.35E-07	2.94E-05	2.76E-07	2.55E-03	1.45E-07	5.69E-05	2.52E-04	1.45E-03	4.21E-07	1.02E-03	6.36E-06
Sepulveda, Avalon to Alameda	3.72E-04	1.36E-06	1.29E-06	3.50E-03	9.70E-07	7.10E-05	6.15E-07	6.15E-03	3.23E-07	1.37E-04	5.63E-04	3.49E-03	9.38E-07	2.46E-03	1.42E-05
Sepulveda, Alameda to ICTF	3.46E-04	1.14E-06	1.08E-06	3.26E-03	8.13E-07	6.61E-05	5.15E-07	5.72E-03	2.71E-07	1.28E-04	4.72E-04	3.25E-03	7.86E-07	2.29E-03	1.19E-05
Sepulveda, ICTF to SR-103	1.72E-04	5.62E-07	5.35E-07	1.62E-03	4.01E-07	3.30E-05	2.54E-07	2.85E-03	1.34E-07	6.37E-05	2.33E-04	1.62E-03	3.88E-07	1.14E-03	5.86E-06
Del Amo, I-110 to Wilmington	3.94E-04	1.55E-06	1.48E-06	3.71E-03	1.11E-06	7.53E-05	7.02E-07	6.52E-03	3.69E-07	1.46E-04	6.43E-04	3.70E-03	1.07E-06	2.61E-03	1.62E-05
Del Amo, Wilminton to Alameda	1.47E-04	5.98E-07	5.69E-07	1.39E-03	4.27E-07	2.82E-05	2.70E-07	2.44E-03	1.42E-07	5.45E-05	2.48E-04	1.38E-03	4.13E-07	9.78E-04	6.24E-06
Del Amo, Alameda to I-710	1.72E-04	6.99E-07	6.66E-07	1.62E-03	5.00E-07	3.29E-05	3.16E-07	2.85E-03	1.67E-07	6.36E-05	2.90E-04	1.61E-03	4.83E-07	1.14E-03	7.29E-06
223rd Street, I-110 to Avalon	8.70E-05	3.84E-07	3.66E-07	8.18E-04	2.74E-07	1.66E-05	1.74E-07	1.44E-03	9.15E-08	3.21E-05	1.59E-04	8.16E-04	2.65E-07	5.77E-04	4.01E-06
223rd Street, Avalon to Wilmington	6.92E-05	3.14E-07	2.99E-07	6.51E-04	2.25E-07	1.32E-05	1.42E-07	1.15E-03	7.49E-08	2.56E-05	1.30E-04	6.49E-04	2.17E-07	4.59E-04	3.28E-06
223rd Street, Wilmington to Alameda	1.25E-04	5.21E-07	4.96E-07	1.17E-03	3.72E-07	2.38E-05	2.36E-07	2.06E-03	1.24E-07	4.60E-05	2.16E-04	1.17E-03	3.60E-07	8.26E-04	5.43E-06
W Wardlow from Alameda to I-710	3.43E-04	1.31E-06	1.25E-06	3.23E-03	9.36E-07	6.56E-05	5.93E-07	5.68E-03	3.12E-07	1.27E-04	5.43E-04	3.22E-03	9.05E-07	2.28E-03	1.37E-05

Table B-10
2030 No Build
Maximum Hourly Truck Emissions

	Port Trucks - - LNG Exhaust								Port Trucks - - LNG Exhaust								
	TOG	Acetaldehyde	Benzene	Formaldehyde	n-Hexane	Propylene	Toluene	Xylenes	PM10	Bromine	Chlorine	Chromium (hex)	Copper	Manganese	Nickel	Sulfates	Zinc
		75070	71432	50000	110543	115071	108883	1330207		7726956	7782505	18540299	7440508	7439965	7440020	9960	7440666
Baseline 2030	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	0.59	1.76E-04	6.45E-04	4.75E-03	1.17E-04	9.92E-03	2.35E-04	1.17E-04	1.34E-01	2.95E-09	4.14E-07	1.48E-10	2.95E-09	2.95E-09	2.95E-09	2.66E-06	2.95E-09
Henry Ford Ramps	0.06	1.66E-05	6.08E-05	4.48E-04	1.11E-05	9.35E-04	2.21E-05	1.11E-05	2.26E-01	5.13E-09	7.19E-07	2.57E-10	5.13E-09	5.13E-09	5.13E-09	4.62E-06	5.13E-09
Henry Ford n/o Ramps to Alameda	0.26	7.78E-05	2.85E-04	2.10E-03	5.18E-05	4.38E-03	1.04E-04	5.18E-05	5.91E-02	1.19E-09	1.67E-07	5.97E-11	1.19E-09	1.19E-09	1.19E-09	1.07E-06	1.19E-09
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	0.40	1.20E-04	4.40E-04	3.24E-03	7.99E-05	6.75E-03	1.60E-04	7.99E-05	9.11E-02	2.45E-09	3.42E-07	1.22E-10	2.45E-09	2.45E-09	2.45E-09	2.20E-06	2.45E-09
SR-103 Anaheim to PCH	0.24	7.25E-05	2.66E-04	1.96E-03	4.83E-05	4.08E-03	9.66E-05	4.83E-05	5.51E-02	1.57E-09	2.20E-07	7.87E-11	1.57E-09	1.57E-09	1.57E-09	1.42E-06	1.57E-09
SR-103 PCH to Sepulveda/Willow	0.21	6.36E-05	2.33E-04	1.72E-03	4.24E-05	3.58E-03	8.48E-05	4.24E-05	4.83E-02	1.33E-09	1.87E-07	6.66E-11	1.33E-09	1.33E-09	1.33E-09	1.20E-06	1.33E-09
E and W Harry Bridges, Figueroa to start Alameda	0.26	7.81E-05	2.86E-04	2.11E-03	5.20E-05	4.40E-03	1.04E-04	5.20E-05	5.93E-02	9.01E-10	1.26E-07	4.51E-11	9.01E-10	9.01E-10	9.01E-10	8.11E-07	9.01E-10
Alameda beginning (E Harry Bridges) to Anaheim	0.17	5.23E-05	1.92E-04	1.41E-03	3.49E-05	2.95E-03	6.97E-05	3.49E-05	3.97E-02	5.13E-10	7.18E-08	2.57E-11	5.13E-10	5.13E-10	5.13E-10	4.62E-07	5.13E-10
Alameda Anaheim to Henry Ford	0.06	1.84E-05	6.74E-05	4.97E-04	1.23E-05	1.04E-03	2.45E-05	1.23E-05	1.40E-02	1.78E-10	2.49E-08	8.88E-12	1.78E-10	1.78E-10	1.78E-10	1.60E-07	1.78E-10
Alameda Henry Ford to PCH	0.17	5.06E-05	1.86E-04	1.37E-03	3.38E-05	2.85E-03	6.75E-05	3.38E-05	3.85E-02	5.22E-10	7.31E-08	2.61E-11	5.22E-10	5.22E-10	5.22E-10	4.70E-07	5.22E-10
Alameda PCH to 405	1.21	3.64E-04	1.34E-03	9.84E-03	2.43E-04	2.05E-02	4.86E-04	2.43E-04	2.77E-01	4.36E-09	6.11E-07	2.18E-10	4.36E-09	4.36E-09	4.36E-09	3.93E-06	4.36E-09
Alameda 405 to del Amo	0.63	1.89E-04	6.93E-04	5.10E-03	1.26E-04	1.06E-02	2.52E-04	1.26E-04	1.44E-01	2.90E-09	4.06E-07	1.45E-10	2.90E-09	2.90E-09	2.90E-09	2.61E-06	2.90E-09
Alameda, del Amo to South Santa Fe Avenue	0.22	6.46E-05	2.37E-04	1.74E-03	4.31E-05	3.64E-03	8.61E-05	4.31E-05	4.91E-02	1.23E-09	1.73E-07	6.17E-11	1.23E-09	1.23E-09	1.23E-09	1.11E-06	1.23E-09
Alameda, South Santa Fe Avenue to SR-91	0.22	6.53E-05	2.40E-04	1.76E-03	4.36E-05	3.68E-03	8.71E-05	4.36E-05	4.96E-02	1.18E-09	1.65E-07	5.89E-11	1.18E-09	1.18E-09	1.18E-09	1.06E-06	1.18E-09
I-110, "C" Street Interchange to Anaheim	0.33	9.84E-05	3.61E-04	2.66E-03	6.56E-05	5.54E-03	1.31E-04	6.56E-05	7.47E-02	1.35E-09	1.89E-07	6.77E-11	1.35E-09	1.35E-09	1.35E-09	1.22E-06	1.35E-09
I-110, Anaheim to PCH	0.54	1.61E-04	5.92E-04	4.36E-03	1.08E-04	9.09E-03	2.15E-04	1.08E-04	1.23E-01	2.19E-09	3.07E-07	1.10E-10	2.19E-09	2.19E-09	2.19E-09	1.97E-06	2.19E-09
1-110, PCH to Sepulveda	0.93	2.78E-04	1.02E-03	7.51E-03	1.85E-04	1.57E-02	3.71E-04	1.85E-04	2.11E-01	3.97E-09	5.56E-07	1.99E-10	3.97E-09	3.97E-09	3.97E-09	3.57E-06	3.97E-09
I-110, Sepulveda to Carson	0.97	2.92E-04	1.07E-03	7.87E-03	1.94E-04	1.64E-02	3.89E-04	1.94E-04	2.21E-01	4.43E-09	6.20E-07	2.21E-10	4.43E-09	4.43E-09	4.43E-09	3.99E-06	4.43E-09
I-110, Carson to Del Amo	0.61	1.82E-04	6.68E-04	4.92E-03	1.22E-04	1.03E-02	2.43E-04	1.22E-04	1.38E-01	2.80E-09	3.93E-07	1.40E-10	2.80E-09	2.80E-09	2.80E-09	2.52E-06	2.80E-09
I-110, Del Amo to 405	0.43	1.28E-04	4.70E-04	3.46E-03	8.54E-05	7.22E-03	1.71E-04	8.54E-05	9.74E-02	2.06E-09	2.88E-07	1.03E-10	2.06E-09	2.06E-09	2.06E-09	1.85E-06	2.06E-09
I-110, 405 to SR-91	0.53	1.59E-04	5.84E-04	4.30E-03	1.06E-04	8.97E-03	2.12E-04	1.06E-04	1.21E-01	3.11E-09	4.36E-07	1.56E-10	3.11E-09	3.11E-09	3.11E-09	2.80E-06	3.11E-09
I-710, Anaheim to PCH	0.71	2.12E-04	7.79E-04	5.74E-03	1.42E-04	1.20E-02	2.83E-04	1.42E-04	1.61E-01	3.00E-09	4.20E-07	1.50E-10	3.00E-09	3.00E-09	3.00E-09	2.70E-06	3.00E-09
I-710, PCH to Willow	1.53	4.58E-04	1.68E-03	1.24E-02	3.06E-04	2.58E-02	6.11E-04	3.06E-04	3.48E-01	6.21E-09	8.70E-07	3.11E-10	6.21E-09	6.21E-09	6.21E-09	5.59E-06	6.21E-09
I-710, Willow to 405	2.30	6.91E-04	2.53E-03	1.87E-02	4.61E-04	3.89E-02	9.22E-04	4.61E-04	5.25E-01	9.39E-09	1.31E-06	4.69E-10	9.39E-09	9.39E-09	9.39E-09	8.45E-06	9.39E-09
I-710, 405 to Del Amo	1.96	5.87E-04	2.15E-03	1.58E-02	3.91E-04	3.31E-02	7.82E-04	3.91E-04	4.46E-01	8.20E-09	1.15E-06	4.10E-10	8.20E-09	8.20E-09	8.20E-09	7.38E-06	8.20E-09
I-710, Del Amo to Long Beach Blvd Interchange	1.57	4.72E-04	1.73E-03	1.27E-02	3.15E-04	2.66E-02	6.30E-04	3.15E-04	3.59E-01	6.64E-09	9.30E-07	3.32E-10	6.64E-09	6.64E-09	6.64E-09	5.98E-06	6.64E-09
I-710, Long Beach Boulevard to SR-91	1.28	3.83E-04	1.41E-03	1.03E-02	2.55E-04	2.16E-02	5.11E-04	2.55E-04	2.91E-01	5.61E-09	7.85E-07	2.80E-10	5.61E-09	5.61E-09	5.61E-09	5.05E-06	5.61E-09
PCH, I110 to Alameda	0.18	5.29E-05	1.94E-04	1.43E-03	3.53E-05	2.98E-03	7.06E-05	3.53E-05	4.02E-02	9.90E-10	1.39E-07	4.95E-11	9.90E-10	9.90E-10	9.90E-10	8.91E-07	9.90E-10
PCH, Alameda to SR-103	0.06	1.84E-05	6.74E-05	4.97E-04	1.23E-05	1.04E-03	2.45E-05	1.23E-05	1.40E-02	5.16E-10	7.23E-08	2.58E-11	5.16E-10	5.16E-10	5.16E-10	4.65E-07	5.16E-10
PCH, SR-103 to I-710	0.28	8.39E-05	3.08E-04	2.27E-03	5.60E-05	4.73E-03	1.12E-04	5.60E-05	6.38E-02	1.11E-09	1.56E-07	5.57E-11	1.11E-09	1.11E-09	1.11E-09	1.00E-06	1.11E-09
Sepulveda, I-110 to Avalon	0.03	8.85E-06	3.25E-05	2.39E-04	5.90E-06	4.99E-04	1.18E-05	5.90E-06	6.73E-03	2.10E-10	2.95E-08	1.05E-11	2.10E-10	2.10E-10	2.10E-10	1.89E-07	2.10E-10
Sepulveda, Avalon to Alameda	0.07	1.96E-05	7.17E-05	5.28E-04	1.30E-05	1.10E-03	2.61E-05	1.30E-05	1.49E-02	4.69E-10	6.57E-08	2.35E-11	4.69E-10	4.69E-10	4.69E-10	4.22E-07	4.69E-10
Sepulveda, Alameda to ICTF	0.08	2.38E-05	8.73E-05	6.43E-04	1.59E-05	1.34E-03	3.18E-05	1.59E-05	1.81E-02	3.93E-10	5.50E-08	1.96E-11	3.93E-10	3.93E-10	3.93E-10	3.54E-07	3.93E-10
Sepulveda, ICTF to SR-103	0.04	1.07E-05	3.93E-05	2.89E-04	7.14E-06	6.03E-04	1.43E-05	7.14E-06	8.14E-03	1.94E-10	2.72E-08	9.70E-12	1.94E-10	1.94E-10	1.94E-10	1.75E-07	1.94E-10
Del Amo, I-110 to Wilmington	0.04	1.11E-05	4.07E-05	3.00E-04	7.40E-06	6.25E-04	1.48E-05	7.40E-06	8.43E-03	5.36E-10	7.50E-08	2.68E-11	5.36E-10	5.36E-10	5.36E-10	4.82E-07	5.36E-10
Del Amo, Wilminton to Alameda	0.04	1.07E-05	3.92E-05	2.89E-04	7.13E-06	6.02E-04	1.43E-05	7.13E-06	8.13E-03	2.06E-10	2.89E-08	1.03E-11	2.06E-10	2.06E-10	2.06E-10	1.86E-07	2.06E-10
Del Amo, Alameda to I-710	0.03	9.48E-06	3.47E-05	2.56E-04	6.32E-06	5.34E-04	1.26E-05	6.32E-06	7.20E-03	2.41E-10	3.38E-08	1.21E-11	2.41E-10	2.41E-10	2.41E-10	2.17E-07	2.41E-10
223rd Street, I-110 to Avalon	0.00	1.23E-06	4.53E-06	3.33E-05	8.23E-07	6.95E-05	1.65E-06	8.23E-07	9.38E-04	1.33E-10	1.86E-08	6.63E-12	1.33E-10	1.33E-10	1.33E-10	1.19E-07	1.33E-10
223rd Street, Avalon to Wilmington	0.00	6.34E-07	2.32E-06	1.71E-05	4.23E-07	3.57E-05	8.45E-07	4.23E-07	4.82E-04	1.09E-10	1.52E-08	5.43E-12	1.09E-10	1.09E-10	1.09E-10	9.77E-08	1.09E-10
223rd Street, Wilmington to Alameda	0.03	9.39E-06	3.44E-05	2.54E-04	6.26E-06	5.29E-04	1.25E-05	6.26E-06	7.13E-03	1.80E-10	2.52E-08	8.99E-12	1.80E-10	1.80E-10	1.80E-10	1.62E-07	1.80E-10
W Wardlow from Alameda to I-710	0.01	4.37E-06	1.60E-05	1.18E-04	2.91E-06	2.46E-04	5.83E-06	2.91E-06	3.32E-03	4.52E-10	6.33E-08	2.26E-11	4.52E-10	4.52E-10	4.52E-10	4.07E-07	4.52E-10

Table B-10
2030 No Build
Maximum Hourly Truck Emissions

	Port Trucks - Diesel Exhaust (LNG & Diesel Trucks)												
	TOG	1,3-Butadiene	Acetaldehyde	Benzene	Ethylbenzene	formaldehyde	n-Hexane	Methanol	MEK	Propylene	Sthrene	Toluene	Xylene
		106990	75070	71432	100414	50000	110543	67561	78933	115071	100425	108883	1330207
Baseline 2030	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	9.84E-01	1.87E-03	7.23E-02	1.97E-02	3.00E-03	1.45E-01	1.54E-03	2.95E-04	1.45E-02	2.55E-02	5.71E-04	1.45E-02	1.02E-02
Henry Ford Ramps	4.09E-01	7.77E-04	3.01E-02	8.18E-03	1.25E-03	6.02E-02	6.42E-04	1.23E-04	6.04E-03	1.06E-02	2.37E-04	6.02E-03	4.26E-03
Henry Ford n/o Ramps to Alameda	2.18E+00	4.14E-03	1.60E-01	4.36E-02	6.65E-03	3.21E-01	3.42E-03	6.54E-04	3.22E-02	5.66E-02	1.27E-03	3.21E-02	2.27E-02
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	8.14E-01	1.55E-03	5.99E-02	1.63E-02	2.48E-03	1.20E-01	1.28E-03	2.44E-04	1.20E-02	2.11E-02	4.72E-04	1.20E-02	8.48E-03
SR-103 Anaheim to PCH	5.20E-01	9.89E-04	3.83E-02	1.04E-02	1.59E-03	7.66E-02	8.17E-04	1.56E-04	7.69E-03	1.35E-02	3.02E-04	7.66E-03	5.42E-03
SR-103 PCH to Sepulveda/Willow	4.37E-01	8.29E-04	3.21E-02	8.73E-03	1.33E-03	6.42E-02	6.85E-04	1.31E-04	6.45E-03	1.13E-02	2.53E-04	6.43E-03	4.54E-03
E and W Harry Bridges, Figueroa to start Alameda	4.85E-01	9.21E-04	3.57E-02	9.70E-03	1.48E-03	7.13E-02	7.61E-04	1.45E-04	7.16E-03	1.26E-02	2.81E-04	7.14E-03	5.05E-03
Alameda beginning (E Harry Bridges) to Anaheim	2.70E-01	5.12E-04	1.98E-02	5.39E-03	8.22E-04	3.97E-02	4.23E-04	8.09E-05	3.98E-03	7.00E-03	1.56E-04	3.97E-03	2.81E-03
Alameda Anaheim to Henry Ford	8.97E-02	1.70E-04	6.59E-03	1.79E-03	2.74E-04	1.32E-02	1.41E-04	2.69E-05	1.32E-03	2.33E-03	5.20E-05	1.32E-03	9.33E-04
Alameda Henry Ford to PCH	2.86E-01	5.43E-04	2.10E-02	5.71E-03	8.71E-04	4.20E-02	4.48E-04	8.57E-05	4.22E-03	7.42E-03	1.66E-04	4.21E-03	2.97E-03
Alameda PCH to 405	1.93E+00	3.67E-03	1.42E-01	3.87E-02	5.90E-03	2.85E-01	3.04E-03	5.80E-04	2.86E-02	5.02E-02	1.12E-03	2.85E-02	2.01E-02
Alameda 405 to del Amo	1.27E+00	2.41E-03	9.31E-02	2.53E-02	3.86E-03	1.86E-01	1.99E-03	3.80E-04	1.87E-02	3.29E-02	7.34E-04	1.86E-02	1.32E-02
Alameda, del Amo to South Santa Fe Avenue	5.35E-01	1.02E-03	3.93E-02	1.07E-02	1.63E-03	7.87E-02	8.40E-04	1.60E-04	7.90E-03	1.39E-02	3.10E-04	7.88E-03	5.57E-03
Alameda, South Santa Fe Avenue to SR-91	5.12E-01	9.72E-04	3.76E-02	1.02E-02	1.56E-03	7.53E-02	8.03E-04	1.53E-04	7.56E-03	1.33E-02	2.97E-04	7.54E-03	5.33E-03
I-110, "C" Street Interchange to Anaheim	3.29E-01	6.24E-04	2.42E-02	6.58E-03	1.00E-03	4.84E-02	5.16E-04	9.86E-05	4.85E-03	8.53E-03	1.91E-04	4.84E-03	3.42E-03
I-110, Anaheim to PCH	5.27E-01	1.00E-03	3.87E-02	1.05E-02	1.61E-03	7.75E-02	8.27E-04	1.58E-04	7.78E-03	1.37E-02	3.05E-04	7.76E-03	5.48E-03
1-110, PCH to Sepulveda	9.31E-01	1.77E-03	6.85E-02	1.86E-02	2.84E-03	1.37E-01	1.46E-03	2.79E-04	1.38E-02	2.42E-02	5.40E-04	1.37E-02	9.69E-03
I-110, Sepulveda to Carson	9.76E-01	1.85E-03	7.18E-02	1.95E-02	2.98E-03	1.44E-01	1.53E-03	2.93E-04	1.44E-02	2.54E-02	5.66E-04	1.44E-02	1.02E-02
I-110, Carson to Del Amo	6.06E-01	1.15E-03	4.45E-02	1.21E-02	1.85E-03	8.91E-02	9.51E-04	1.82E-04	8.95E-03	1.57E-02	3.51E-04	8.92E-03	6.31E-03
I-110, Del Amo to 405	4.20E-01	7.97E-04	3.09E-02	8.40E-03	1.28E-03	6.17E-02	6.59E-04	1.26E-04	6.20E-03	1.09E-02	2.43E-04	6.18E-03	4.37E-03
I-110, 405 to SR-91	5.33E-01	1.01E-03	3.92E-02	1.07E-02	1.63E-03	7.85E-02	8.37E-04	1.60E-04	7.88E-03	1.39E-02	3.09E-04	7.86E-03	5.55E-03
I-710, Anaheim to PCH	9.70E-01	1.84E-03	7.13E-02	1.94E-02	2.96E-03	1.43E-01	1.52E-03	2.91E-04	1.43E-02	2.52E-02	5.62E-04	1.43E-02	1.01E-02
I-710, PCH to Willow	2.00E+00	3.81E-03	1.47E-01	4.01E-02	6.11E-03	2.95E-01	3.15E-03	6.01E-04	2.96E-02	5.20E-02	1.16E-03	2.95E-02	2.09E-02
I-710, Willow to 405	3.02E+00	5.74E-03	2.22E-01	6.05E-02	9.22E-03	4.45E-01	4.75E-03	9.07E-04	4.46E-02	7.85E-02	1.75E-03	4.45E-02	3.15E-02
I-710, 405 to Del Amo	2.57E+00	4.88E-03	1.89E-01	5.14E-02	7.83E-03	3.78E-01	4.03E-03	7.70E-04	3.79E-02	6.66E-02	1.49E-03	3.78E-02	2.67E-02
I-710, Del Amo to Long Beach Blvd Interchange	2.07E+00	3.93E-03	1.52E-01	4.14E-02	6.31E-03	3.04E-01	3.25E-03	6.20E-04	3.05E-02	5.37E-02	1.20E-03	3.05E-02	2.15E-02
I-710, Long Beach Boulevard to SR-91	1.67E+00	3.17E-03	1.23E-01	3.34E-02	5.08E-03	2.45E-01	2.62E-03	5.00E-04	2.46E-02	4.33E-02	9.67E-04	2.46E-02	1.74E-02
PCH, I110 to Alameda	3.92E-01	7.44E-04	2.88E-02	7.84E-03	1.19E-03	5.76E-02	6.15E-04	1.18E-04	5.79E-03	1.02E-02	2.27E-04	5.77E-03	4.08E-03
PCH, Alameda to SR-103	2.83E-01	5.37E-04	2.08E-02	5.66E-03	8.63E-04	4.16E-02	4.44E-04	8.49E-05	4.18E-03	7.35E-03	1.64E-04	4.17E-03	2.94E-03
PCH, SR-103 to I-710	6.62E-01	1.26E-03	4.87E-02	1.32E-02	2.02E-03	9.74E-02	1.04E-03	1.98E-04	9.77E-03	1.72E-02	3.84E-04	9.75E-03	6.89E-03
Sepulveda, I-110 to Avalon	5.72E-02	1.09E-04	4.20E-03	1.14E-03	1.74E-04	8.41E-03	8.97E-05	1.71E-05	8.44E-04	1.48E-03	3.32E-05	8.42E-04	5.95E-04
Sepulveda, Avalon to Alameda	1.79E-01	3.39E-04	1.31E-02	3.57E-03	5.45E-04	2.63E-02	2.80E-04	5.36E-05	2.64E-03	4.64E-03	1.04E-04	2.63E-03	1.86E-03
Sepulveda, Alameda to ICTF	2.15E-01	4.08E-04	1.58E-02	4.30E-03	6.55E-04	3.16E-02	3.37E-04	6.45E-05	3.17E-03	5.58E-03	1.25E-04	3.16E-03	2.24E-03
Sepulveda, ICTF to SR-103	1.09E-01	2.07E-04	7.99E-03	2.17E-03	3.31E-04	1.60E-02	1.71E-04	3.26E-05	1.61E-03	2.82E-03	6.30E-05	1.60E-03	1.13E-03
Del Amo, I-110 to Wilmington	1.45E-01	2.76E-04	1.07E-02	2.91E-03	4.43E-04	2.14E-02	2.28E-04	4.36E-05	2.14E-03	3.77E-03	8.42E-05	2.14E-03	1.51E-03
Del Amo, Wilminton to Alameda	5.00E-02	9.50E-05	3.67E-03	1.00E-03	1.52E-04	7.35E-03	7.85E-05	1.50E-05	7.38E-04	1.30E-03	2.90E-05	7.36E-04	5.20E-04
Del Amo, Alameda to I-710	5.69E-02	1.08E-04	4.18E-03	1.14E-03	1.74E-04	8.37E-03	8.93E-05	1.71E-05	8.40E-04	1.48E-03	3.30E-05	8.38E-04	5.92E-04
223rd Street, I-110 to Avalon	1.63E-02	3.09E-05	1.20E-03	3.25E-04	4.96E-05	2.39E-03	2.55E-05	4.88E-06	2.40E-04	4.22E-04	9.43E-06	2.40E-04	1.69E-04
223rd Street, Avalon to Wilmington	9.66E-03	1.84E-05	7.10E-04	1.93E-04	2.95E-05	1.42E-03	1.52E-05	2.90E-06	1.43E-04	2.51E-04	5.60E-06	1.42E-04	1.01E-04
223rd Street, Wilmington to Alameda	3.64E-02	6.92E-05	2.68E-03	7.29E-04	1.11E-04	5.36E-03	5.72E-05	1.09E-05	5.38E-04	9.46E-04	2.11E-05	5.37E-04	3.79E-04
W Wardlow from Alameda to I-710	1.40E-01	2.67E-04	1.03E-02	2.81E-03	4.28E-04	2.07E-02	2.20E-04	4.21E-05	2.07E-03	3.65E-03	8.14E-05	2.07E-03	1.46E-03

Table B-10
2030 No Build
Maximum Hourly Truck Emissions

	DPM	Ammonia	Antimony	Arsenic	Bromine	Bromine	Cadmium	Chlorine	Chromium	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Sulfates	Vanadium	Zinc
		7664417	7440360	7440382	7726956	7726956	7440439	7782505	18540299	7440508	7439921	7439965	7439976	7440020	7782492	9960	7440622	7440666
Baseline 2030	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	2.04E-01	6.86E-04	7.33E-06	1.02E-06	3.67E-06	3.67E-06	8.15E-06	7.01E-05	1.22E-07	5.09E-06	8.55E-06	8.15E-06	6.11E-06	3.87E-06	2.04E-06	3.54E-03	5.91E-06	8.92E-05
Henry Ford Ramps	3.54E-01	1.19E-03	1.27E-05	1.77E-06	6.37E-06	6.37E-06	1.42E-05	1.22E-04	2.12E-07	8.85E-06	1.49E-05	1.42E-05	1.06E-05	6.73E-06	3.54E-06	6.16E-03	1.03E-05	1.55E-04
Henry Ford n/o Ramps to Alameda	8.13E-02	2.74E-04	2.93E-06	4.07E-07	1.46E-06	1.46E-06	3.25E-06	2.80E-05	4.88E-08	2.03E-06	3.42E-06	3.25E-06	2.44E-06	1.55E-06	8.13E-07	1.42E-03	2.36E-06	3.56E-05
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.68E-01	5.68E-04	6.07E-06	8.42E-07	3.03E-06	3.03E-06	6.74E-06	5.80E-05	1.01E-07	4.21E-06	7.08E-06	6.74E-06	5.05E-06	3.20E-06	1.68E-06	2.93E-03	4.89E-06	7.38E-05
SR-103 Anaheim to PCH	1.08E-01	3.63E-04	3.88E-06	5.38E-07	1.94E-06	1.94E-06	4.31E-06	3.70E-05	6.46E-08	2.69E-06	4.52E-06	4.31E-06	3.23E-06	2.05E-06	1.08E-06	1.87E-03	3.12E-06	4.71E-05
SR-103 PCH to Sepulveda/Willow	9.03E-02	3.04E-04	3.25E-06	4.52E-07	1.63E-06	1.63E-06	3.61E-06	3.11E-05	5.42E-08	2.26E-06	3.79E-06	3.61E-06	2.71E-06	1.72E-06	9.03E-07	1.57E-03	2.62E-06	3.96E-05
E and W Harry Bridges, Figueroa to start Alameda	5.93E-02	2.00E-04	2.14E-06	2.97E-07	1.07E-06	1.07E-06	2.37E-06	2.04E-05	3.56E-08	1.48E-06	2.49E-06	2.37E-06	1.78E-06	1.13E-06	5.93E-07	1.03E-03	1.72E-06	2.60E-05
Alameda beginning (E Harry Bridges) to Anaheim	3.31E-02	1.12E-04	1.19E-06	1.66E-07	5.97E-07	5.97E-07	1.33E-06	1.14E-05	1.99E-08	8.29E-07	1.39E-06	1.33E-06	9.94E-07	6.30E-07	3.31E-07	5.77E-04	9.61E-07	1.45E-05
Alameda Anaheim to Henry Ford	1.10E-02	3.72E-05	3.98E-07	5.52E-08	1.99E-07	1.99E-07	4.42E-07	3.80E-06	6.63E-09	2.76E-07	4.64E-07	4.42E-07	3.31E-07	2.10E-07	1.10E-07	1.92E-04	3.20E-07	4.84E-06
Alameda Henry Ford to PCH	3.50E-02	1.18E-04	1.26E-06	1.75E-07	6.30E-07	6.30E-07	1.40E-06	1.20E-05	2.10E-08	8.76E-07	1.47E-06	1.40E-06	1.05E-06	6.66E-07	3.50E-07	6.09E-04	1.02E-06	1.53E-05
Alameda PCH to 405	2.74E-01	9.23E-04	9.86E-06	1.37E-06	4.93E-06	4.93E-06	1.10E-05	9.42E-05	1.64E-07	6.85E-06	1.15E-05	1.10E-05	8.22E-06	5.21E-06	2.74E-06	4.77E-03	7.94E-06	1.20E-04
Alameda 405 to del Amo	1.79E-01	6.02E-04	6.43E-06	8.93E-07	3.21E-06	3.21E-06	7.14E-06	6.14E-05	1.07E-07	4.46E-06	7.50E-06	7.14E-06	5.36E-06	3.39E-06	1.79E-06	3.11E-03	5.18E-06	7.82E-05
Alameda, del Amo to South Santa Fe Avenue	7.52E-02	2.53E-04	2.71E-06	3.76E-07	1.35E-06	1.35E-06	3.01E-06	2.59E-05	4.51E-08	1.88E-06	3.16E-06	3.01E-06	2.26E-06	1.43E-06	7.52E-07	1.31E-03	2.18E-06	3.29E-05
Alameda, South Santa Fe Avenue to SR-91	7.20E-02	2.43E-04	2.59E-06	3.60E-07	1.30E-06	1.30E-06	2.88E-06	2.48E-05	4.32E-08	1.80E-06	3.02E-06	2.88E-06	2.16E-06	1.37E-06	7.20E-07	1.25E-03	2.09E-06	3.15E-05
I-110, "C" Street Interchange to Anaheim	8.47E-02	2.85E-04	3.05E-06	4.24E-07	1.52E-06	1.52E-06	3.39E-06	2.91E-05	5.08E-08	2.12E-06	3.56E-06	3.39E-06	2.54E-06	1.61E-06	8.47E-07	1.47E-03	2.46E-06	3.71E-05
I-110, Anaheim to PCH	1.36E-01	4.57E-04	4.89E-06	6.78E-07	2.44E-06	2.44E-06	5.43E-06	4.67E-05	8.14E-08	3.39E-06	5.70E-06	5.43E-06	4.07E-06	2.58E-06	1.36E-06	2.36E-03	3.94E-06	5.94E-05
1-110, PCH to Sepulveda	2.40E-01	8.09E-04	8.64E-06	1.20E-06	4.32E-06	4.32E-06	9.60E-06	8.26E-05	1.44E-07	6.00E-06	1.01E-05	9.60E-06	7.20E-06	4.56E-06	2.40E-06	4.18E-03	6.96E-06	1.05E-04
I-110, Sepulveda to Carson	2.52E-01	8.48E-04	9.06E-06	1.26E-06	4.53E-06	4.53E-06	1.01E-05	8.66E-05	1.51E-07	6.29E-06	1.06E-05	1.01E-05	7.55E-06	4.78E-06	2.52E-06	4.38E-03	7.30E-06	1.10E-04
I-110, Carson to Del Amo	1.56E-01	5.26E-04	5.62E-06	7.81E-07	2.81E-06	2.81E-06	6.25E-06	5.37E-05	9.37E-08	3.90E-06	6.56E-06	6.25E-06	4.68E-06	2.97E-06	1.56E-06	2.72E-03	4.53E-06	6.84E-05
I-110, Del Amo to 405	1.08E-01	3.64E-04	3.89E-06	5.41E-07	1.95E-06	1.95E-06	4.33E-06	3.72E-05	6.49E-08	2.70E-06	4.54E-06	4.33E-06	3.24E-06	2.05E-06	1.08E-06	1.88E-03	3.14E-06	4.74E-05
I-110, 405 to SR-91	1.37E-01	4.63E-04	4.95E-06	6.87E-07	2.47E-06	2.47E-06	5.50E-06	4.73E-05	8.25E-08	3.44E-06	5.77E-06	5.50E-06	4.12E-06	2.61E-06	1.37E-06	2.39E-03	3.99E-06	6.02E-05
I-710, Anaheim to PCH	2.01E-01	6.77E-04	7.23E-06	1.00E-06	3.62E-06	3.62E-06	8.04E-06	6.91E-05	1.21E-07	5.02E-06	8.44E-06	8.04E-06	6.03E-06	3.82E-06	2.01E-06	3.50E-03	5.83E-06	8.80E-05
I-710, PCH to Willow	4.15E-01	1.40E-03	1.50E-05	2.08E-06	7.48E-06	7.48E-06	1.66E-05	1.43E-04	2.49E-07	1.04E-05	1.74E-05	1.66E-05	1.25E-05	7.89E-06	4.15E-06	7.23E-03	1.20E-05	1.82E-04
I-710, Willow to 405	6.26E-01	2.11E-03	2.25E-05	3.13E-06	1.13E-05	1.13E-05	2.51E-05	2.15E-04	3.76E-07	1.57E-05	2.63E-05	2.51E-05	1.88E-05	1.19E-05	6.26E-06	1.09E-02	1.82E-05	2.74E-04
I-710, 405 to Del Amo	5.32E-01	1.79E-03	1.91E-05	2.66E-06	9.57E-06	9.57E-06	2.13E-05	1.83E-04	3.19E-07	1.33E-05	2.23E-05	2.13E-05	1.60E-05	1.01E-05	5.32E-06	9.25E-03	1.54E-05	2.33E-04
I-710, Del Amo to Long Beach Blvd Interchange	4.28E-01	1.44E-03	1.54E-05	2.14E-06	7.71E-06	7.71E-06	1.71E-05	1.47E-04	2.57E-07	1.07E-05	1.80E-05	1.71E-05	1.29E-05	8.14E-06	4.28E-06	7.45E-03	1.24E-05	1.88E-04
I-710, Long Beach Boulevard to SR-91	3.45E-01	1.16E-03	1.24E-05	1.73E-06	6.22E-06	6.22E-06	1.38E-05	1.19E-04	2.07E-07	8.64E-06	1.45E-05	1.38E-05	1.04E-05	6.56E-06	3.45E-06	6.01E-03	1.00E-05	1.51E-04
PCH, I110 to Alameda	4.31E-02	1.45E-04	1.55E-06	2.15E-07	7.75E-07	7.75E-07	1.72E-06	1.48E-05	2.58E-08	1.08E-06	1.81E-06	1.72E-06	1.29E-06	8.18E-07	4.31E-07	7.49E-04	1.25E-06	1.89E-05
PCH, Alameda to SR-103	3.07E-02	1.03E-04	1.10E-06	1.53E-07	5.52E-07	5.52E-07	1.23E-06	1.06E-05	1.84E-08	7.67E-07	1.29E-06	1.23E-06	9.20E-07	5.83E-07	3.07E-07	5.34E-04	8.90E-07	1.34E-05
PCH, SR-103 to I-710	7.26E-02	2.45E-04	2.61E-06	3.63E-07	1.31E-06	1.31E-06	2.91E-06	2.50E-05	4.36E-08	1.82E-06	3.05E-06	2.91E-06	2.18E-06	1.38E-06	7.26E-07	1.26E-03	2.11E-06	3.18E-05
Sepulveda, I-110 to Avalon	6.99E-03	2.35E-05	2.52E-07	3.49E-08	1.26E-07	1.26E-07	2.79E-07	2.40E-06	4.19E-09	1.75E-07	2.93E-07	2.79E-07	2.10E-07	1.33E-07	6.99E-08	1.22E-04	2.03E-07	3.06E-06
Sepulveda, Avalon to Alameda	2.17E-02	7.30E-05	7.80E-07	1.08E-07	3.90E-07	3.90E-07	8.67E-07	7.46E-06	1.30E-08	5.42E-07	9.11E-07	8.67E-07	6.50E-07	4.12E-07	2.17E-07	3.77E-04	6.29E-07	9.50E-06
Sepulveda, Alameda to ICTF	2.61E-02	8.79E-05	9.39E-07	1.30E-07	4.69E-07	4.69E-07	1.04E-06	8.97E-06	1.56E-08	6.52E-07	1.10E-06	1.04E-06	7.82E-07	4.96E-07	2.61E-07	4.54E-04	7.56E-07	1.14E-05
Sepulveda, ICTF to SR-103	1.32E-02	4.44E-05	4.74E-07	6.58E-08	2.37E-07	2.37E-07	5.27E-07	4.53E-06	7.90E-09	3.29E-07	5.53E-07	5.27E-07	3.95E-07	2.50E-07	1.32E-07	2.29E-04	3.82E-07	5.77E-06
Del Amo, I-110 to Wilmington	1.75E-02	5.91E-05	6.31E-07	8.76E-08	3.16E-07	3.16E-07	7.01E-07	6.03E-06	1.05E-08	4.38E-07	7.36E-07	7.01E-07	5.26E-07	3.33E-07	1.75E-07	3.05E-04	5.08E-07	7.68E-06
Del Amo, Wilminton to Alameda	6.17E-03	2.08E-05	2.22E-07	3.08E-08	1.11E-07	1.11E-07	2.47E-07	2.12E-06	3.70E-09	1.54E-07	2.59E-07	2.47E-07	1.85E-07	1.17E-07	6.17E-08	1.07E-04	1.79E-07	2.70E-06
Del Amo, Alameda to I-710	6.97E-03	2.35E-05	2.51E-07	3.48E-08	1.25E-07	1.25E-07	2.79E-07	2.40E-06	4.18E-09	1.74E-07	2.93E-07	2.79E-07	2.09E-07	1.32E-07	6.97E-08	1.21E-04	2.02E-07	3.05E-06
223rd Street, I-110 to Avalon	1.96E-03	6.61E-06	7.07E-08	9.82E-09	3.53E-08	3.53E-08	7.85E-08	6.75E-07	1.18E-09	4.91E-08	8.25E-08	7.85E-08	5.89E-08	3.73E-08	1.96E-08	3.42E-05	5.69E-08	8.60E-07
223rd Street, Avalon to Wilmington	1.16E-03	3.92E-06	4.19E-08	5.82E-09	2.10E-08	2.10E-08	4.66E-08	4.01E-07	6.99E-10	2.91E-08	4.89E-08	4.66E-08	3.49E-08	2.21E-08	1.16E-08	2.03E-05	3.38E-08	5.10E-07
223rd Street, Wilmington to Alameda	4.53E-03	1.52E-05	1.63E-07	2.26E-08	8.15E-08	8.15E-08	1.81E-07	1.56E-06	2.72E-09	1.13E-07	1.90E-07	1.81E-07	1.36E-07	8.60E-08	4.53E-08	7.88E-05	1.31E-07	1.98E-06
W Wardlow from Alameda to I-710	1.68E-02	5.67E-05	6.06E-07	8.42E-08	3.03E-07	3.03E-07	6.73E-07	5.79E-06	1.01E-08	4.21E-07	7.07E-07	6.73E-07	5.05E-07	3.20E-07	1.68E-07	2.93E-04	4.88E-07	7.37E-06

Table B-10
2030 No Build
Maximum Hourly Truck Emissions

	SCAG Gasoline Truck Emissions					
	TOG	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
		71432	50000	106990	75070	107028
Baseline 2030	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	9.21E-05	1.94E-06	1.25E-06	4.29E-07	2.26E-07	1.04E-07
Henry Ford Ramps	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Henry Ford n/o Ramps to Alameda	1.89E-03	3.99E-05	2.57E-05	8.81E-06	4.63E-06	2.14E-06
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.17E-04	2.47E-06	1.59E-06	5.46E-07	2.87E-07	1.32E-07
SR-103 Anaheim to PCH	5.14E-04	1.08E-05	6.99E-06	2.39E-06	1.26E-06	5.81E-07
SR-103 PCH to Sepulveda/Willow	9.44E-04	1.99E-05	1.28E-05	4.40E-06	2.31E-06	1.07E-06
E and W Harry Bridges, Figueroa to start Alameda	2.95E-03	6.21E-05	4.01E-05	1.37E-05	7.22E-06	3.33E-06
Alameda beginning (E Harry Bridges) to Anaheim	2.34E-03	4.92E-05	3.18E-05	1.09E-05	5.72E-06	2.64E-06
Alameda Anaheim to Henry Ford	1.26E-03	2.65E-05	1.71E-05	5.85E-06	3.08E-06	1.42E-06
Alameda Henry Ford to PCH	1.00E-03	2.11E-05	1.36E-05	4.67E-06	2.46E-06	1.13E-06
Alameda PCH to 405	2.33E-02	4.92E-04	3.17E-04	1.09E-04	5.72E-05	2.64E-05
Alameda 405 to del Amo	1.85E-02	3.90E-04	2.52E-04	8.62E-05	4.54E-05	2.09E-05
Alameda, del Amo to South Santa Fe Avenue	8.58E-03	1.81E-04	1.17E-04	4.00E-05	2.10E-05	9.70E-06
Alameda, South Santa Fe Avenue to SR-91	8.08E-03	1.70E-04	1.10E-04	3.76E-05	1.98E-05	9.13E-06
I-110, "C" Street Interchange to Anaheim	4.40E-03	9.28E-05	5.99E-05	2.05E-05	1.08E-05	4.98E-06
I-110, Anaheim to PCH	7.90E-03	1.66E-04	1.07E-04	3.68E-05	1.93E-05	8.92E-06
1-110, PCH to Sepulveda	1.74E-02	3.66E-04	2.36E-04	8.09E-05	4.25E-05	1.96E-05
I-110, Sepulveda to Carson	2.75E-02	5.81E-04	3.75E-04	1.28E-04	6.75E-05	3.11E-05
I-110, Carson to Del Amo	1.91E-02	4.02E-04	2.59E-04	8.89E-05	4.67E-05	2.16E-05
I-110, Del Amo to 405	1.73E-02	3.65E-04	2.35E-04	8.07E-05	4.24E-05	1.96E-05
I-110, 405 to SR-91	3.95E-02	8.33E-04	5.37E-04	1.84E-04	9.68E-05	4.46E-05
I-710, Anaheim to PCH	3.66E-03	7.71E-05	4.97E-05	1.70E-05	8.96E-06	4.13E-06
I-710, PCH to Willow	7.98E-03	1.68E-04	1.09E-04	3.72E-05	1.96E-05	9.02E-06
I-710, Willow to 405	1.27E-02	2.68E-04	1.73E-04	5.92E-05	3.11E-05	1.44E-05
I-710, 405 to Del Amo	2.03E-02	4.27E-04	2.76E-04	9.44E-05	4.96E-05	2.29E-05
I-710, Del Amo to Long Beach Blvd Interchange	1.77E-02	3.74E-04	2.41E-04	8.26E-05	4.35E-05	2.00E-05
I-710, Long Beach Boulevard to SR-91	2.48E-02	5.22E-04	3.37E-04	1.15E-04	6.07E-05	2.80E-05
PCH, I110 to Alameda	3.19E-02	6.73E-04	4.34E-04	1.49E-04	7.82E-05	3.61E-05
PCH, Alameda to SR-103	6.24E-03	1.32E-04	8.49E-05	2.91E-05	1.53E-05	7.06E-06
PCH, SR-103 to I-710	5.35E-03	1.13E-04	7.27E-05	2.49E-05	1.31E-05	6.04E-06
Sepulveda, I-110 to Avalon	7.83E-03	1.65E-04	1.06E-04	3.65E-05	1.92E-05	8.85E-06
Sepulveda, Avalon to Alameda	1.11E-02	2.34E-04	1.51E-04	5.17E-05	2.72E-05	1.25E-05
Sepulveda, Alameda to ICTF	1.06E-03	2.24E-05	1.45E-05	4.95E-06	2.60E-06	1.20E-06
Sepulveda, ICTF to SR-103	2.20E-04	4.64E-06	2.99E-06	1.03E-06	5.39E-07	2.49E-07
Del Amo, I-110 to Wilmington	2.02E-02	4.26E-04	2.75E-04	9.41E-05	4.95E-05	2.28E-05
Del Amo, Wilminton to Alameda	8.40E-03	1.77E-04	1.14E-04	3.91E-05	2.06E-05	9.49E-06
Del Amo, Alameda to I-710	1.01E-02	2.12E-04	1.37E-04	4.69E-05	2.47E-05	1.14E-05
223rd Street, I-110 to Avalon	7.48E-03	1.58E-04	1.02E-04	3.48E-05	1.83E-05	8.45E-06
223rd Street, Avalon to Wilmington	6.58E-03	1.39E-04	8.95E-05	3.06E-05	1.61E-05	7.43E-06
223rd Street, Wilmington to Alameda	8.20E-03	1.73E-04	1.11E-04	3.82E-05	2.01E-05	9.26E-06
W Wardlow from Alameda to I-710	1.49E-02	3.15E-04	2.03E-04	6.96E-05	3.66E-05	1.69E-05

Table B-10
2030 No Build
Maximum Hourly Truck Emissions

	SCAG Diesel Truck Exhaust												
	TOG	1,3-Butadiene	Acetaldehyde	Benzene	Ethylbenzene	formaldehyde	n-Hexane	Methanol	MEK	Propylene	Sthrene	Toluene	Xylene
		106990	75070	71432	100414	50000	110543	67561	78933	115071	100425	108883	1330207
Baseline 2030	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	6.07E-04	1.15E-06	4.47E-05	1.22E-05	1.85E-06	8.93E-05	9.53E-07	1.82E-07	8.97E-06	1.58E-05	3.52E-07	8.94E-06	6.32E-06
Henry Ford Ramps	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Henry Ford n/o Ramps to Alameda	1.30E-02	2.47E-05	9.55E-04	2.60E-04	3.96E-05	1.91E-03	2.04E-05	3.90E-06	1.92E-04	3.37E-04	7.53E-06	1.91E-04	1.35E-04
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	7.72E-04	1.47E-06	5.67E-05	1.54E-05	2.35E-06	1.14E-04	1.21E-06	2.32E-07	1.14E-05	2.00E-05	4.48E-07	1.14E-05	8.03E-06
SR-103 Anaheim to PCH	3.39E-03	6.43E-06	2.49E-04	6.78E-05	1.03E-05	4.98E-04	5.32E-06	1.02E-06	5.00E-05	8.79E-05	1.96E-06	4.99E-05	3.53E-05
SR-103 PCH to Sepulveda/Willow	6.22E-03	1.18E-05	4.57E-04	1.24E-04	1.90E-05	9.15E-04	9.77E-06	1.87E-06	9.19E-05	1.62E-04	3.61E-06	9.16E-05	6.48E-05
E and W Harry Bridges, Figueroa to start Alameda	1.54E-02	2.93E-05	1.13E-03	3.09E-04	4.71E-05	2.27E-03	2.42E-05	4.63E-06	2.28E-04	4.01E-04	8.95E-06	2.27E-04	1.61E-04
Alameda beginning (E Harry Bridges) to Anaheim	1.22E-02	2.32E-05	8.99E-04	2.45E-04	3.73E-05	1.80E-03	1.92E-05	3.67E-06	1.81E-04	3.17E-04	7.09E-06	1.80E-04	1.27E-04
Alameda Anaheim to Henry Ford	6.57E-03	1.25E-05	4.83E-04	1.31E-04	2.00E-05	9.67E-04	1.03E-05	1.97E-06	9.70E-05	1.71E-04	3.81E-06	9.68E-05	6.84E-05
Alameda Henry Ford to PCH	5.25E-03	9.97E-06	3.86E-04	1.05E-04	1.60E-05	7.72E-04	8.24E-06	1.57E-06	7.75E-05	1.36E-04	3.04E-06	7.73E-05	5.46E-05
Alameda PCH to 405	1.35E-01	2.57E-04	9.94E-03	2.71E-03	4.12E-04	1.99E-02	2.12E-04	4.06E-05	2.00E-03	3.51E-03	7.84E-05	1.99E-03	1.41E-03
Alameda 405 to del Amo	1.07E-01	2.04E-04	7.88E-03	2.15E-03	3.27E-04	1.58E-02	1.68E-04	3.22E-05	1.58E-03	2.78E-03	6.22E-05	1.58E-03	1.12E-03
Alameda, del Amo to South Santa Fe Avenue	4.97E-02	9.44E-05	3.65E-03	9.95E-04	1.52E-04	7.31E-03	7.80E-05	1.49E-05	7.34E-04	1.29E-03	2.88E-05	7.32E-04	5.17E-04
Alameda, South Santa Fe Avenue to SR-91	4.68E-02	8.89E-05	3.44E-03	9.36E-04	1.43E-04	6.88E-03	7.34E-05	1.40E-05	6.91E-04	1.21E-03	2.71E-05	6.89E-04	4.87E-04
I-110, "C" Street Interchange to Anaheim	2.92E-02	5.56E-05	2.15E-03	5.85E-04	8.92E-05	4.30E-03	4.59E-05	8.77E-06	4.32E-04	7.60E-04	1.70E-05	4.31E-04	3.04E-04
I-110, Anaheim to PCH	5.24E-02	9.96E-05	3.86E-03	1.05E-03	1.60E-04	7.72E-03	8.23E-05	1.57E-05	7.75E-04	1.36E-03	3.04E-05	7.72E-04	5.46E-04
1-110, PCH to Sepulveda	1.15E-01	2.19E-04	8.48E-03	2.31E-03	3.52E-04	1.70E-02	1.81E-04	3.46E-05	1.70E-03	2.99E-03	6.69E-05	1.70E-03	1.20E-03
I-110, Sepulveda to Carson	1.83E-01	3.48E-04	1.35E-02	3.66E-03	5.58E-04	2.69E-02	2.87E-04	5.49E-05	2.70E-03	4.75E-03	1.06E-04	2.69E-03	1.90E-03
I-110, Carson to Del Amo	1.27E-01	2.41E-04	9.32E-03	2.54E-03	3.86E-04	1.86E-02	1.99E-04	3.80E-05	1.87E-03	3.29E-03	7.35E-05	1.87E-03	1.32E-03
I-110, Del Amo to 405	1.15E-01	2.19E-04	8.46E-03	2.30E-03	3.51E-04	1.69E-02	1.81E-04	3.45E-05	1.70E-03	2.99E-03	6.67E-05	1.69E-03	1.20E-03
I-110, 405 to SR-91	2.62E-01	4.98E-04	1.93E-02	5.25E-03	8.00E-04	3.86E-02	4.12E-04	7.87E-05	3.87E-03	6.81E-03	1.52E-04	3.86E-03	2.73E-03
I-710, Anaheim to PCH	2.41E-02	4.58E-05	1.77E-03	4.82E-04	7.35E-05	3.55E-03	3.78E-05	7.23E-06	3.56E-04	6.26E-04	1.40E-05	3.55E-04	2.51E-04
I-710, PCH to Willow	5.26E-02	1.00E-04	3.87E-03	1.05E-03	1.60E-04	7.74E-03	8.26E-05	1.58E-05	7.77E-04	1.37E-03	3.05E-05	7.75E-04	5.48E-04
I-710, Willow to 405	8.37E-02	1.59E-04	6.16E-03	1.68E-03	2.55E-04	1.23E-02	1.31E-04	2.51E-05	1.24E-03	2.17E-03	4.86E-05	1.23E-03	8.72E-04
I-710, 405 to Del Amo	1.34E-01	2.54E-04	9.82E-03	2.67E-03	4.07E-04	1.96E-02	2.10E-04	4.01E-05	1.97E-03	3.47E-03	7.74E-05	1.97E-03	1.39E-03
I-710, Del Amo to Long Beach Blvd Interchange	1.17E-01	2.22E-04	8.60E-03	2.34E-03	3.57E-04	1.72E-02	1.84E-04	3.51E-05	1.73E-03	3.04E-03	6.78E-05	1.72E-03	1.22E-03
I-710, Long Beach Boulevard to SR-91	1.63E-01	3.10E-04	1.20E-02	3.27E-03	4.98E-04	2.40E-02	2.56E-04	4.90E-05	2.41E-03	4.24E-03	9.46E-05	2.40E-03	1.70E-03
PCH, I110 to Alameda	1.43E-01	2.71E-04	1.05E-02	2.86E-03	4.36E-04	2.10E-02	2.24E-04	4.28E-05	2.11E-03	3.71E-03	8.28E-05	2.10E-03	1.49E-03
PCH, Alameda to SR-103	2.79E-02	5.31E-05	2.05E-03	5.59E-04	8.52E-05	4.11E-03	4.38E-05	8.38E-06	4.12E-04	7.25E-04	1.62E-05	4.11E-04	2.91E-04
PCH, SR-103 to I-710	2.39E-02	4.54E-05	1.76E-03	4.79E-04	7.29E-05	3.52E-03	3.75E-05	7.17E-06	3.53E-04	6.21E-04	1.39E-05	3.52E-04	2.49E-04
Sepulveda, I-110 to Avalon	4.10E-02	7.79E-05	3.01E-03	8.20E-04	1.25E-04	6.03E-03	6.43E-05	1.23E-05	6.05E-04	1.06E-03	2.38E-05	6.04E-04	4.27E-04
Sepulveda, Avalon to Alameda	5.81E-02	1.10E-04	4.27E-03	1.16E-03	1.77E-04	8.55E-03	9.12E-05	1.74E-05	8.58E-04	1.51E-03	3.37E-05	8.56E-04	6.05E-04
Sepulveda, Alameda to ICTF	5.56E-03	1.06E-05	4.09E-04	1.11E-04	1.70E-05	8.18E-04	8.73E-06	1.67E-06	8.21E-05	1.44E-04	3.23E-06	8.19E-05	5.79E-05
Sepulveda, ICTF to SR-103	1.15E-03	2.19E-06	8.47E-05	2.30E-05	3.51E-06	1.69E-04	1.81E-06	3.45E-07	1.70E-05	2.99E-05	6.68E-07	1.70E-05	1.20E-05
Del Amo, I-110 to Wilmington	1.06E-01	2.01E-04	7.77E-03	2.12E-03	3.22E-04	1.56E-02	1.66E-04	3.17E-05	1.56E-03	2.75E-03	6.13E-05	1.56E-03	1.10E-03
Del Amo, Wilminton to Alameda	4.40E-02	8.35E-05	3.23E-03	8.80E-04	1.34E-04	6.47E-03	6.90E-05	1.32E-05	6.49E-04	1.14E-03	2.55E-05	6.47E-04	4.58E-04
Del Amo, Alameda to I-710	5.27E-02	1.00E-04	3.88E-03	1.06E-03	1.61E-04	7.76E-03	8.28E-05	1.58E-05	7.79E-04	1.37E-03	3.06E-05	7.77E-04	5.49E-04
223rd Street, I-110 to Avalon	3.91E-02	7.43E-05	2.88E-03	7.83E-04	1.19E-04	5.76E-03	6.14E-05	1.17E-05	5.78E-04	1.02E-03	2.27E-05	5.76E-04	4.07E-04
223rd Street, Avalon to Wilmington	3.44E-02	6.54E-05	2.53E-03	6.89E-04	1.05E-04	5.07E-03	5.41E-05	1.03E-05	5.09E-04	8.94E-04	2.00E-05	5.07E-04	3.58E-04
223rd Street, Wilmington to Alameda	4.29E-02	8.15E-05	3.15E-03	8.58E-04	1.31E-04	6.31E-03	6.73E-05	1.29E-05	6.34E-04	1.11E-03	2.49E-05	6.32E-04	4.47E-04
W Wardlow from Alameda to I-710	7.82E-02	1.49E-04	5.75E-03	1.56E-03	2.39E-04	1.15E-02	1.23E-04	2.35E-05	1.16E-03	2.03E-03	4.54E-05	1.15E-03	8.14E-04

Table B-10
2030 No Build
Maximum Hourly Truck Emissions

	SCAG Diesel Truck Exhaust Emissions																	
	DPM	Ammonia	Antimony	Arsenic	Bromine	Bromine	Cadmium	Chlorine	Chromium (hex)	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Sulfates	Vanadium	Zinc
		7664417	7440360	7440382	7726956	7726956	7440439	7782505	18540299	7440508	7439921	7439965	7439976	7440020	7782492	9960	7440622	7440666
Baseline 2030		lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	1.54E-04	5.18E-07	5.54E-09	7.69E-10	2.77E-09	2.77E-09	6.15E-09	5.29E-08	9.23E-11	3.84E-09	6.46E-09	6.15E-09	4.61E-09	2.92E-09	1.54E-09	2.68E-06	4.46E-09	6.73E-08
Henry Ford Ramps	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Henry Ford n/o Ramps to Alameda	9.95E-04	3.35E-06	3.58E-08	4.97E-09	1.79E-08	1.79E-08	3.98E-08	3.42E-07	5.97E-10	2.49E-08	4.18E-08	3.98E-08	2.98E-08	1.89E-08	9.95E-09	1.73E-05	2.88E-08	4.36E-07
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.95E-04	6.58E-07	7.03E-09	9.77E-10	3.52E-09	3.52E-09	7.82E-09	6.72E-08	1.17E-10	4.88E-09	8.21E-09	7.82E-09	5.86E-09	3.71E-09	1.95E-09	3.40E-06	5.67E-09	8.56E-08
SR-103 Anaheim to PCH	8.57E-04	2.89E-06	3.09E-08	4.29E-09	1.54E-08	1.54E-08	3.43E-08	2.95E-07	5.14E-10	2.14E-08	3.60E-08	3.43E-08	2.57E-08	1.63E-08	8.57E-09	1.49E-05	2.49E-08	3.76E-07
SR-103 PCH to Sepulveda/Willow	1.57E-03	5.31E-06	5.67E-08	7.87E-09	2.83E-08	2.83E-08	6.30E-08	5.42E-07	9.45E-10	3.94E-08	6.61E-08	6.30E-08	4.72E-08	2.99E-08	1.57E-08	2.74E-05	4.57E-08	6.90E-07
E and W Harry Bridges, Figueroa to start Alameda	2.83E-03	9.54E-06	1.02E-07	1.42E-08	5.10E-08	5.10E-08	1.13E-07	9.75E-07	1.70E-09	7.08E-08	1.19E-07	1.13E-07	8.50E-08	5.38E-08	2.83E-08	4.93E-05	8.22E-08	1.24E-06
Alameda beginning (E Harry Bridges) to Anaheim	2.24E-03	7.56E-06	8.08E-08	1.12E-08	4.04E-08	4.04E-08	8.98E-08	7.72E-07	1.35E-09	5.61E-08	9.43E-08	8.98E-08	6.73E-08	4.26E-08	2.24E-08	3.91E-05	6.51E-08	9.83E-07
Alameda Anaheim to Henry Ford	1.21E-03	4.06E-06	4.34E-08	6.03E-09	2.17E-08	2.17E-08	4.83E-08	4.15E-07	7.24E-10	3.02E-08	5.07E-08	4.83E-08	3.62E-08	2.29E-08	1.21E-08	2.10E-05	3.50E-08	5.28E-07
Alameda Henry Ford to PCH	9.63E-04	3.25E-06	3.47E-08	4.82E-09	1.73E-08	1.73E-08	3.85E-08	3.31E-07	5.78E-10	2.41E-08	4.05E-08	3.85E-08	2.89E-08	1.83E-08	9.63E-09	1.68E-05	2.79E-08	4.22E-07
Alameda PCH to 405	2.69E-02	9.06E-05	9.68E-07	1.34E-07	4.84E-07	4.84E-07	1.08E-06	9.25E-06	1.61E-08	6.72E-07	1.13E-06	1.08E-06	8.06E-07	5.11E-07	2.69E-07	4.68E-04	7.80E-07	1.18E-05
Alameda 405 to del Amo	2.13E-02	7.18E-05	7.68E-07	1.07E-07	3.84E-07	3.84E-07	8.53E-07	7.33E-06	1.28E-08	5.33E-07	8.95E-07	8.53E-07	6.40E-07	4.05E-07	2.13E-07	3.71E-04	6.18E-07	9.34E-06
Alameda, del Amo to South Santa Fe Avenue	9.88E-03	3.33E-05	3.56E-07	4.94E-08	1.78E-07	1.78E-07	3.95E-07	3.40E-06	5.93E-09	2.47E-07	4.15E-07	3.95E-07	2.96E-07	1.88E-07	9.88E-08	1.72E-04	2.87E-07	4.33E-06
Alameda, South Santa Fe Avenue to SR-91	9.30E-03	3.13E-05	3.35E-07	4.65E-08	1.67E-07	1.67E-07	3.72E-07	3.20E-06	5.58E-09	2.33E-07	3.91E-07	3.72E-07	2.79E-07	1.77E-07	9.30E-08	1.62E-04	2.70E-07	4.07E-06
I-110, "C" Street Interchange to Anaheim	8.60E-03	2.90E-05	3.10E-07	4.30E-08	1.55E-07	1.55E-07	3.44E-07	2.96E-06	5.16E-09	2.15E-07	3.61E-07	3.44E-07	2.58E-07	1.63E-07	8.60E-08	1.50E-04	2.49E-07	3.77E-06
I-110, Anaheim to PCH	1.54E-02	5.20E-05	5.55E-07	7.71E-08	2.78E-07	2.78E-07	6.17E-07	5.31E-06	9.26E-09	3.86E-07	6.48E-07	6.17E-07	4.63E-07	2.93E-07	1.54E-07	2.68E-04	4.47E-07	6.76E-06
1-110, PCH to Sepulveda	3.39E-02	1.14E-04	1.22E-06	1.70E-07	6.10E-07	6.10E-07	1.36E-06	1.17E-05	2.03E-08	8.48E-07	1.42E-06	1.36E-06	1.02E-06	6.44E-07	3.39E-07	5.90E-04	9.84E-07	1.49E-05
I-110, Sepulveda to Carson	5.38E-02	1.81E-04	1.94E-06	2.69E-07	9.69E-07	9.69E-07	2.15E-06	1.85E-05	3.23E-08	1.35E-06	2.26E-06	2.15E-06	1.61E-06	1.02E-06	5.38E-07	9.36E-04	1.56E-06	2.36E-05
I-110, Carson to Del Amo	3.73E-02	1.26E-04	1.34E-06	1.86E-07	6.71E-07	6.71E-07	1.49E-06	1.28E-05	2.24E-08	9.32E-07	1.57E-06	1.49E-06	1.12E-06	7.08E-07	3.73E-07	6.49E-04	1.08E-06	1.63E-05
I-110, Del Amo to 405	3.38E-02	1.14E-04	1.22E-06	1.69E-07	6.09E-07	6.09E-07	1.35E-06	1.16E-05	2.03E-08	8.46E-07	1.42E-06	1.35E-06	1.01E-06	6.43E-07	3.38E-07	5.89E-04	9.81E-07	1.48E-05
I-110, 405 to SR-91	7.72E-02	2.60E-04	2.78E-06	3.86E-07	1.39E-06	1.39E-06	3.09E-06	2.65E-05	4.63E-08	1.93E-06	3.24E-06	3.09E-06	2.31E-06	1.47E-06	7.72E-07	1.34E-03	2.24E-06	3.38E-05
I-710, Anaheim to PCH	6.10E-03	2.06E-05	2.20E-07	3.05E-08	1.10E-07	1.10E-07	2.44E-07	2.10E-06	3.66E-09	1.53E-07	2.56E-07	2.44E-07	1.83E-07	1.16E-07	6.10E-08	1.06E-04	1.77E-07	2.67E-06
I-710, PCH to Willow	1.33E-02	4.49E-05	4.80E-07	6.66E-08	2.40E-07	2.40E-07	5.33E-07	4.58E-06	7.99E-09	3.33E-07	5.59E-07	5.33E-07	4.00E-07	2.53E-07	1.33E-07	2.32E-04	3.86E-07	5.83E-06
I-710, Willow to 405	2.12E-02	7.14E-05	7.63E-07	1.06E-07	3.82E-07	3.82E-07	8.48E-07	7.29E-06	1.27E-08	5.30E-07	8.90E-07	8.48E-07	6.36E-07	4.03E-07	2.12E-07	3.69E-04	6.15E-07	9.29E-06
I-710, 405 to Del Amo	3.38E-02	1.14E-04	1.22E-06	1.69E-07	6.09E-07	6.09E-07	1.35E-06	1.16E-05	2.03E-08	8.45E-07	1.42E-06	1.35E-06	1.01E-06	6.42E-07	3.38E-07	5.88E-04	9.80E-07	1.48E-05
I-710, Del Amo to Long Beach Blvd Interchange	2.96E-02	9.97E-05	1.07E-06	1.48E-07	5.33E-07	5.33E-07	1.18E-06	1.02E-05	1.78E-08	7.40E-07	1.24E-06	1.18E-06	8.88E-07	5.62E-07	2.96E-07	5.15E-04	8.58E-07	1.30E-05
I-710, Long Beach Boulevard to SR-91	4.13E-02	1.39E-04	1.49E-06	2.07E-07	7.44E-07	7.44E-07	1.65E-06	1.42E-05	2.48E-08	1.03E-06	1.74E-06	1.65E-06	1.24E-06	7.85E-07	4.13E-07	7.19E-04	1.20E-06	1.81E-05
PCH, I110 to Alameda	2.52E-02	8.49E-05	9.07E-07	1.26E-07	4.54E-07	4.54E-07	1.01E-06	8.67E-06	1.51E-08	6.30E-07	1.06E-06	1.01E-06	7.56E-07	4.79E-07	2.52E-07	4.39E-04	7.31E-07	1.10E-05
PCH, Alameda to SR-103	4.93E-03	1.66E-05	1.77E-07	2.46E-08	8.87E-08	8.87E-08	1.97E-07	1.70E-06	2.96E-09	1.23E-07	2.07E-07	1.97E-07	1.48E-07	9.37E-08	4.93E-08	8.58E-05	1.43E-07	2.16E-06
PCH, SR-103 to I-710	4.22E-03	1.42E-05	1.52E-07	2.11E-08	7.60E-08	7.60E-08	1.69E-07	1.45E-06	2.53E-09	1.06E-07	1.77E-07	1.69E-07	1.27E-07	8.02E-08	4.22E-08	7.35E-05	1.22E-07	1.85E-06
Sepulveda, I-110 to Avalon	7.52E-03	2.53E-05	2.71E-07	3.76E-08	1.35E-07	1.35E-07	3.01E-07	2.59E-06	4.51E-09	1.88E-07	3.16E-07	3.01E-07	2.26E-07	1.43E-07	7.52E-08	1.31E-04	2.18E-07	3.30E-06
Sepulveda, Avalon to Alameda	1.07E-02	3.59E-05	3.84E-07	5.33E-08	1.92E-07	1.92E-07	4.27E-07	3.67E-06	6.40E-09	2.67E-07	4.48E-07	4.27E-07	3.20E-07	2.03E-07	1.07E-07	1.86E-04	3.09E-07	4.67E-06
Sepulveda, Alameda to ICTF	1.02E-03	3.44E-06	3.68E-08	5.11E-09	1.84E-08	1.84E-08	4.08E-08	3.51E-07	6.13E-10	2.55E-08	4.29E-08	4.08E-08	3.06E-08	1.94E-08	1.02E-08	1.78E-05	2.96E-08	4.47E-07
Sepulveda, ICTF to SR-103	2.11E-04	7.12E-07	7.61E-09	1.06E-09	3.81E-09	3.81E-09	8.46E-09	7.27E-08	1.27E-10	5.29E-09	8.88E-09	8.46E-09	6.34E-09	4.02E-09	2.11E-09	3.68E-06	6.13E-09	9.26E-08
Del Amo, I-110 to Wilmington	1.94E-02	6.54E-05	6.99E-07	9.71E-08	3.49E-07	3.49E-07	7.76E-07	6.68E-06	1.16E-08	4.85E-07	8.15E-07	7.76E-07	5.82E-07	3.69E-07	1.94E-07	3.38E-04	5.63E-07	8.50E-06
Del Amo, Wilminton to Alameda	8.07E-03	2.72E-05	2.91E-07	4.04E-08	1.45E-07	1.45E-07	3.23E-07	2.78E-06	4.84E-09	2.02E-07	3.39E-07	3.23E-07	2.42E-07	1.53E-07	8.07E-08	1.40E-04	2.34E-07	3.53E-06
Del Amo, Alameda to I-710	9.68E-03	3.26E-05	3.49E-07	4.84E-08	1.74E-07	1.74E-07	3.87E-07	3.33E-06	5.81E-09	2.42E-07	4.07E-07	3.87E-07	2.90E-07	1.84E-07	9.68E-08	1.68E-04	2.81E-07	4.24E-06
223rd Street, I-110 to Avalon	7.18E-03	2.42E-05	2.59E-07	3.59E-08	1.29E-07	1.29E-07	2.87E-07	2.47E-06	4.31E-09	1.80E-07	3.02E-07	2.87E-07	2.16E-07	1.37E-07	7.18E-08	1.25E-04	2.08E-07	3.15E-06
223rd Street, Avalon to Wilmington	6.32E-03	2.13E-05	2.28E-07	3.16E-08	1.14E-07	1.14E-07	2.53E-07	2.17E-06	3.79E-09	1.58E-07	2.66E-07	2.53E-07	1.90E-07	1.20E-07	6.32E-08	1.10E-04	1.83E-07	2.77E-06
223rd Street, Wilmington to Alameda	7.88E-03	2.65E-05	2.84E-07	3.94E-08	1.42E-07	1.42E-07	3.15E-07	2.71E-06	4.73E-09	1.97E-07	3.31E-07	3.15E-07	2.36E-07	1.50E-07	7.88E-08	1.37E-04	2.28E-07	3.45E-06
W Wardlow from Alameda to I-710	1.44E-02	4.84E-05	5.17E-07	7.18E-08	2.58E-07	2.58E-07	5.74E-07	4.94E-06	8.62E-09	3.59E-07	6.03E-07	5.74E-07	4.31E-07	2.73E-07	1.44E-07	2.50E-04	4.16E-07	6.29E-06

Table B-11
2030 Alternative 1
Maximum Hourly Truck Emissions

	Length	Cong Speed	Port Peak Hour trucks	SCAG Peak Hour trucks	Port Peak hr LNG trucks	Port Peak hr Dsl / Alt trucks	SCAG Peak hr Gas trucks	SCAG Peak hr Dsl trucks
Alternative 1, 2030	mile	mph	veh/hr	veh/hr	veh/hr	veh/hr	veh/hr	veh/hr
SR-47 Mainline, New Dock Ramps to Transition		50	3375	29	882	2493		
New Dock Ramps - Cerritos Channel (A1 Line)	0.24	50	3375	29	882	2493	15	14
SB Cerritos Channel - Transition (G1 Line)	0.13	50	1687.5	14.5	441	1247	8	7
NB Cerritos Channel - Transition (E1 Line)	0.15	50	1687.5	14.5	441	1247	8	7
Mainline Transition to HF Ramps & SR-103		50	1725	22	374	1351		
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	0.23	50	862.5	11	187	676	6	5
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	0.20	50	862.5	11	187	676	6	5
Henry Ford Ramps	0.31	20	356	4	70	286	2	2
Henry Ford n/o Ramps to Alameda	0.68	20	687	28	112	575	15	13
SR-47 Extension, HF Ramps to Alameda		50	1651	10	508	1143		
SB, 103 Split to Dominguex Channel (D1 Line)	0.70	50	825.5	5	254	571	3	2
NB, 103 Split to Dominguex Channel (F1 Line)	0.69	50	825.5	5	254	571	3	2
Dominguez Channel - Alameda (I1 Line)	0.83	50	1651	10	508	1143	5	5
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.10	50	1369	18	304	1065	9	9
SR-103 Anaheim to PCH	0.57	50	1518	53	369	1149	28	25
SR-103 PCH to Sepulveda/Willow	1.02	50	800	69	165	635	36	33
E and W Harry Bridges, Figueroa to start Alameda	1.44	35	521	30	167	354	16	14
Alameda beginning (E Harry Bridges) to Anaheim	0.77	35	576	53	213	363	28	25
Alameda Anaheim to Henry Ford	0.42	35	369	69	132	237	36	33
Alameda, Henry Ford to PCH	0.34	35	848	67	214	634	35	32
Alameda PCH to 405	2.27	30	2228	174	659	1569	90	84
Alameda 405 to del Amo	1.72	35	1644	208	426	1218	108	100
Alameda, del Amo to South Santa Fe Avenue	0.84	35	1357	192	543	814	100	92
Alameda, South Santa Fe Avenue to SR-91	1.15	35	852	122	224	628	63	59
I-110, "C" Street Interchange to Anaheim	0.49	45	1771	315	554	1217	163	152
I-110, Anaheim to PCH	0.80	45	1788	356	556	1232	185	171
1-110, PCH to Sepulveda	1.39	45	1850	468	578	1272	243	225
I-110, Sepulveda to Carson	1.56	45	1755	651	547	1208	338	313
I-110, Carson to Del Amo	1.02	45	1679	684	527	1152	355	329
I-110, Del Amo to 405	0.74	45	1622	863	511	1111	448	415
I-110, 405 to SR-91	1.09	45	1426	1274	454	972	661	613
I-710, Anaheim to PCH	0.50	40	4239	246	1181	3058	128	118
I-710, PCH to Willow	1.01	40	4417	273	1290	3127	142	131
I-710, Willow to 405	1.52	40	4400	293	1284	3116	152	141
I-710, 405 to Del Amo	1.42	40	4111	523	1201	2910	271	252
I-710, Del Amo to Long Beach Blvd Interchange	1.17	40	4015	553	1184	2831	287	266
I-710, Long Beach Boulevard to SR-91	0.96	40	4036	857	1173	2863	445	412
PCH, I110 to Alameda	2.38	20	365	132	100	265	69	63
PCH, Alameda to SR-103	0.94	20	110	116	26	84	60	56
PCH, SR-103 to I-710	0.98	20	871	90	260	611	47	43
Sepulveda, I-110 to Avalon	1.37	25	75	91	14	61	47	44
Sepulveda, Avalon to Alameda	1.70	25	163	105	27	136	54	51
Sepulveda, Alameda to ICTF	0.67	25	373	38	69	304	20	18
Sepulveda, ICTF to SR-103	0.17	25	800	31	165	635	16	15
Del Amo, I-110 to Wilmington	2.96	25	60	85	12	48	44	41
Del Amo, Wilminton to Alameda	0.77	25	115	181	43	72	94	87
Del Amo, Alameda to I-710	0.87	25	124	197	45	79	102	95
223rd Street, I-110 to Avalon	1.36	25	18	106	3	15	55	51
223rd Street, Avalon to Wilmington	1.23	25	21	105	1	20	54	51
223rd Street, Wilmington to Alameda	0.79	25	110	180	44	66	93	87
W Wardlow from Alameda to I-710	1.30	25	197	183	13	184	95	88

Table B-11
2030 Alternative 1
Maximum Hourly Truck Emissions

	Port - LNG Trucks				Port - Diesel Trucks		SCAG	SCAG - Diesel Trucks	
	LNG Exhst TOG	LNG Exhst Dsl TOG	LNG Exhst PM	LNG Exhst DPM	Dsl Exhst TOG	Dsl Exhst PM	Gasoline Trucks TOG	Dsl Exhst TOG	Dsl Exhst PM
Alternative 1, 2030	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi
SR-47 Mainline, New Dock Ramps to Transition									
New Dock Ramps - Cerritos Channel (A1 Line)	0.4890	0.0257	0.1114	0.0059	0.202	0.066	0.022	0.157	0.055
SB Cerritos Channel - Transition (G1 Line)	0.4890	0.0257	0.1114	0.0059	0.202	0.066	0.022	0.157	0.055
NB Cerritos Channel - Transition (E1 Line)	0.4890	0.0257	0.1114	0.0059	0.202	0.066	0.022	0.157	0.055
Mainline Transition to HF Ramps & SR-103									
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	0.4890	0.0257	0.1114	0.0059	0.202	0.066	0.022	0.157	0.055
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	0.4890	0.0257	0.1114	0.0059	0.202	0.066	0.022	0.157	0.055
Henry Ford Ramps	0.4890	0.0257	0.1114	0.0059	0.431	0.046	0.069	0.333	0.059
Henry Ford n/o Ramps to Alameda	0.4890	0.0257	0.1114	0.0059	0.431	0.046	0.069	0.333	0.059
SR-47 Extension, HF Ramps to Alameda	0.4890	0.0257	0.1114	0.0059					
SB, 103 Split to Dominguex Channel (D1 Line)	0.4890	0.0257	0.1114	0.0059	0.202	0.066	0.022	0.157	0.055
NB, 103 Split to Dominguex Channel (F1 Line)	0.4890	0.0257	0.1114	0.0059	0.202	0.066	0.022	0.157	0.055
Dominguez Channel - Alameda (I1 Line)	0.4890	0.0257	0.1114	0.0059	0.202	0.066	0.022	0.157	0.055
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	0.4890	0.0257	0.1114	0.0059	0.202	0.066	0.022	0.157	0.055
SR-103 Anaheim to PCH	0.4890	0.0257	0.1114	0.0059	0.202	0.066	0.022	0.157	0.055
SR-103 PCH to Sepulveda/Willow	0.4890	0.0257	0.1114	0.0059	0.202	0.066	0.022	0.157	0.055
E and W Harry Bridges, Figueroa to start Alameda	0.4890	0.0257	0.1114	0.0059	0.286	0.047	0.032	0.218	0.048
Alameda beginning (E Harry Bridges) to Anaheim	0.4890	0.0257	0.1114	0.0059	0.286	0.047	0.032	0.218	0.048
Alameda Anaheim to Henry Ford	0.4890	0.0257	0.1114	0.0059	0.286	0.047	0.032	0.218	0.048
Alameda, Henry Ford to PCH	0.4890	0.0257	0.1114	0.0059	0.286	0.047	0.032	0.218	0.048
Alameda PCH to 405	0.4890	0.0257	0.1114	0.0059	0.328	0.046	0.040	0.250	0.050
Alameda 405 to del Amo	0.4890	0.0257	0.1114	0.0059	0.286	0.047	0.032	0.218	0.048
Alameda, del Amo to South Santa Fe Avenue	0.4890	0.0257	0.1114	0.0059	0.286	0.047	0.032	0.218	0.048
Alameda, South Santa Fe Avenue to SR-91	0.4890	0.0257	0.1114	0.0059	0.286	0.047	0.032	0.218	0.048
I-110, "C" Street Interchange to Anaheim	0.4890	0.0257	0.1114	0.0059	0.223	0.058	0.024	0.172	0.051
I-110, Anaheim to PCH	0.4890	0.0257	0.1114	0.0059	0.223	0.058	0.024	0.172	0.051
1-110, PCH to Sepulveda	0.4890	0.0257	0.1114	0.0059	0.223	0.058	0.024	0.172	0.051
I-110, Sepulveda to Carson	0.4890	0.0257	0.1114	0.0059	0.223	0.058	0.024	0.172	0.051
I-110, Carson to Del Amo	0.4890	0.0257	0.1114	0.0059	0.223	0.058	0.024	0.172	0.051
I-110, Del Amo to 405	0.4890	0.0257	0.1114	0.0059	0.223	0.058	0.024	0.172	0.051
I-110, 405 to SR-91	0.4890	0.0257	0.1114	0.0059	0.223	0.058	0.024	0.172	0.051
I-710, Anaheim to PCH	0.4890	0.0257	0.1114	0.0059	0.252	0.052	0.027	0.192	0.049
I-710, PCH to Willow	0.4890	0.0257	0.1114	0.0059	0.252	0.052	0.027	0.192	0.049
I-710, Willow to 405	0.4890	0.0257	0.1114	0.0059	0.252	0.052	0.027	0.192	0.049
I-710, 405 to Del Amo	0.4890	0.0257	0.1114	0.0059	0.252	0.052	0.027	0.192	0.049
I-710, Del Amo to Long Beach Blvd Interchange	0.4890	0.0257	0.1114	0.0059	0.252	0.052	0.027	0.192	0.049
I-710, Long Beach Boulevard to SR-91	0.4890	0.0257	0.1114	0.0059	0.252	0.052	0.027	0.192	0.049
PCH, I110 to Alameda	0.4890	0.0257	0.1114	0.0059	0.431	0.046	0.069	0.333	0.059
PCH, Alameda to SR-103	0.4890	0.0257	0.1114	0.0059	0.431	0.046	0.069	0.333	0.059
PCH, SR-103 to I-710	0.4890	0.0257	0.1114	0.0059	0.431	0.046	0.069	0.333	0.059
Sepulveda, I-110 to Avalon	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
Sepulveda, Avalon to Alameda	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
Sepulveda, Alameda to ICTF	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
Sepulveda, ICTF to SR-103	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
Del Amo, I-110 to Wilmington	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
Del Amo, Wilminton to Alameda	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
Del Amo, Alameda to I-710	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
223rd Street, I-110 to Avalon	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
223rd Street, Avalon to Wilmington	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
223rd Street, Wilmington to Alameda	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
W Wardlow from Alameda to I-710	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053

Table B-11
2030 Alternative 1
Maximum Hourly Truck Emissions

	Port		Port		SCAG	SCAG	
	LNG TOG	LNG PM	Dsl + LNG Dsl TOG	Dsl + LNG DPM	Gasoline TOG	Dsl Exhst TOG	Dsl Exhst PM
Alternative 1, 2030	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to Transition							
New Dock Ramps - Cerritos Channel (A1 Line)	0.228	0.052	0.278	0.090	0.0002	0.0012	0.0004
SB Cerritos Channel - Transition (G1 Line)	0.062	0.014	0.08	0.024	0.0000	0.0003	0.0001
NB Cerritos Channel - Transition (E1 Line)	0.071	0.016	0.09	0.028	0.0001	0.0004	0.0001
Mainline Transition to HF Ramps & SR-103	0.000	0.000	0.00	0.000			
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	0.046	0.011	0.07	0.023	0.0001	0.0004	0.0001
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	0.040	0.009	0.06	0.020	0.0001	0.0004	0.0001
Henry Ford Ramps	0.023	0.005	0.09	0.009	0.0001	0.0004	0.0001
Henry Ford n/o Ramps to Alameda	0.082	0.019	0.38	0.041	0.0015	0.0067	0.0012
SR-47 Extension, HF Ramps to Alameda	0.000	0.000	0.00	0.000			
SB, 103 Split to Dominguex Channel (D1 Line)	0.192	0.044	0.19	0.061	0.0001	0.0006	0.0002
NB, 103 Split to Dominguex Channel (F1 Line)	0.189	0.043	0.19	0.060	0.0001	0.0006	0.0002
Dominguez Channel - Alameda (I1 Line)	0.455	0.104	0.45	0.144	0.0002	0.0014	0.0005
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	0.361	0.082	0.54	0.176	0.0005	0.0033	0.0011
SR-103 Anaheim to PCH	0.227	0.052	0.30	0.098	0.0008	0.0050	0.0017
SR-103 PCH to Sepulveda/Willow	0.182	0.041	0.30	0.097	0.0018	0.0117	0.0041
E and W Harry Bridges, Figueroa to start Alameda	0.260	0.059	0.34	0.057	0.0016	0.0100	0.0022
Alameda beginning (E Harry Bridges) to Anaheim	0.177	0.040	0.19	0.031	0.0015	0.0094	0.0021
Alameda Anaheim to Henry Ford	0.060	0.014	0.07	0.011	0.0011	0.0067	0.0015
Alameda, Henry Ford to PCH	0.079	0.018	0.14	0.024	0.0008	0.0053	0.0012
Alameda PCH to 405	1.611	0.367	2.66	0.376	0.0181	0.1046	0.0208
Alameda 405 to del Amo	0.790	0.180	1.36	0.229	0.0131	0.0828	0.0182
Alameda, del Amo to South Santa Fe Avenue	0.492	0.112	0.46	0.078	0.0059	0.0373	0.0082
Alameda, South Santa Fe Avenue to SR-91	0.279	0.064	0.47	0.079	0.0052	0.0325	0.0072
I-110, "C" Street Interchange to Anaheim	0.294	0.067	0.31	0.080	0.0043	0.0283	0.0083
I-110, Anaheim to PCH	0.482	0.110	0.51	0.132	0.0079	0.0521	0.0153
1-110, PCH to Sepulveda	0.863	0.197	0.91	0.235	0.0178	0.1183	0.0348
I-110, Sepulveda to Carson	0.918	0.209	0.97	0.251	0.0278	0.1849	0.0544
I-110, Carson to Del Amo	0.581	0.132	0.61	0.157	0.0192	0.1275	0.0375
I-110, Del Amo to 405	0.408	0.093	0.43	0.110	0.0176	0.1166	0.0343
I-110, 405 to SR-91	0.535	0.122	0.55	0.142	0.0382	0.2540	0.0747
I-710, Anaheim to PCH	0.636	0.145	0.88	0.183	0.0038	0.0250	0.0063
I-710, PCH to Willow	1.398	0.319	1.82	0.377	0.0085	0.0559	0.0141
I-710, Willow to 405	2.108	0.481	2.75	0.569	0.0138	0.0909	0.0230
I-710, 405 to Del Amo	1.838	0.419	2.39	0.496	0.0229	0.1512	0.0383
I-710, Del Amo to Long Beach Blvd Interchange	1.499	0.342	1.93	0.399	0.0201	0.1322	0.0335
I-710, Long Beach Boulevard to SR-91	1.215	0.277	1.59	0.330	0.0254	0.1677	0.0425
PCH, I110 to Alameda	0.255	0.058	0.61	0.067	0.0248	0.1109	0.0196
PCH, Alameda to SR-103	0.027	0.006	0.08	0.008	0.0086	0.0386	0.0068
PCH, SR-103 to I-710	0.276	0.063	0.58	0.064	0.0070	0.0312	0.0055
Sepulveda, I-110 to Avalon	0.021	0.005	0.07	0.009	0.0073	0.0380	0.0070
Sepulveda, Avalon to Alameda	0.049	0.011	0.19	0.023	0.0104	0.0545	0.0100
Sepulveda, Alameda to ICTF	0.050	0.011	0.17	0.021	0.0015	0.0078	0.0014
Sepulveda, ICTF to SR-103	0.031	0.007	0.09	0.011	0.0003	0.0016	0.0003
Del Amo, I-110 to Wilmington	0.037	0.008	0.12	0.015	0.0147	0.0768	0.0141
Del Amo, Wilminton to Alameda	0.035	0.008	0.05	0.006	0.0081	0.0423	0.0078
Del Amo, Alameda to I-710	0.042	0.010	0.06	0.007	0.0100	0.0525	0.0096
223rd Street, I-110 to Avalon	0.004	0.001	0.02	0.002	0.0084	0.0441	0.0081
223rd Street, Avalon to Wilmington	0.002	0.000	0.02	0.002	0.0075	0.0393	0.0072
223rd Street, Wilmington to Alameda	0.037	0.008	0.05	0.006	0.0083	0.0434	0.0080
W Wardlow from Alameda to I-710	0.018	0.004	0.20	0.024	0.0139	0.0726	0.0133

Table B-11
2030 Alternative 1
Maximum Hourly Truck Emissions

	Maximum Hourly Toxic Emissions from Trucks														
	DPM	Acetaldehyde	Acrolein	Ammonia	Antimony	Arsenic	Benzene	Bromine	1,3-Butadiene	Cadmium	Chlorine	Chromium (hex)	Copper	Ethylbenzene	Formaldehyde
	9901	75070	107028	7664417	7440360	7440382	71432	7726956	106990	7440439	7782505	18540299	7440508	100414	50000
Alternative 1, 2030	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to Transition															
New Dock Ramps - Cerritos Channel (A1 Line)	9.06E-02	2.06E-02	1.98E-07	3.05E-04	3.26E-06	4.53E-07	5.60E-03	3.26E-06	5.32E-04	3.62E-06	3.12E-05	5.44E-08	2.26E-06	8.53E-04	4.11E-02
SB Cerritos Channel - Transition (G1 Line)	2.45E-02	5.57E-03	5.36E-08	8.27E-05	8.83E-07	1.23E-07	1.52E-03	8.83E-07	1.44E-04	9.81E-07	8.44E-06	1.47E-08	6.13E-07	2.31E-04	1.11E-02
NB Cerritos Channel - Transition (E1 Line)	2.83E-02	6.43E-03	6.19E-08	9.54E-05	1.02E-06	1.42E-07	1.75E-03	1.02E-06	1.66E-04	1.13E-06	9.74E-06	1.70E-08	7.08E-07	2.67E-04	1.29E-02
Mainline Transition to HF Ramps & SR-103															
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	2.34E-02	5.30E-03	7.20E-08	7.89E-05	8.43E-07	1.17E-07	1.44E-03	8.43E-07	1.37E-04	9.36E-07	8.05E-06	1.40E-08	5.85E-07	2.20E-04	1.06E-02
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	2.04E-02	4.61E-03	6.26E-08	6.86E-05	7.33E-07	1.02E-07	1.25E-03	7.33E-07	1.19E-04	8.14E-07	7.00E-06	1.22E-08	5.09E-07	1.91E-04	9.22E-03
Henry Ford Ramps	9.39E-03	6.33E-03	1.11E-07	3.16E-05	3.38E-07	4.69E-08	1.72E-03	3.38E-07	1.64E-04	3.76E-07	3.23E-06	5.63E-09	2.35E-07	2.62E-04	1.27E-02
Henry Ford n/o Ramps to Alameda	4.19E-02	2.81E-02	1.70E-06	1.41E-04	1.51E-06	2.10E-07	7.68E-03	1.51E-06	7.33E-04	1.68E-06	1.44E-05	2.52E-08	1.05E-06	1.17E-03	5.63E-02
SR-47 Extension, HF Ramps to Alameda															
SB, 103 Split to Dominguex Channel (D1 Line)	6.10E-02	1.39E-02	9.96E-08	2.05E-04	2.19E-06	3.05E-07	3.78E-03	2.19E-06	3.59E-04	2.44E-06	2.10E-05	3.66E-08	1.52E-06	5.76E-04	2.78E-02
NB, 103 Split to Dominguex Channel (F1 Line)	6.01E-02	1.37E-02	9.81E-08	2.02E-04	2.16E-06	3.00E-07	3.73E-03	2.16E-06	3.54E-04	2.40E-06	2.07E-05	3.61E-08	1.50E-06	5.68E-04	2.74E-02
Dominguez Channel - Alameda (I1 Line)	1.45E-01	3.29E-02	2.36E-07	4.87E-04	5.20E-06	7.23E-07	8.96E-03	5.20E-06	8.52E-04	5.78E-06	4.97E-05	8.67E-08	3.61E-06	1.37E-03	6.59E-02
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.77E-01	4.00E-02	5.63E-07	5.95E-04	6.36E-06	8.83E-07	1.09E-02	6.36E-06	1.04E-03	7.07E-06	6.08E-05	1.06E-07	4.42E-06	1.66E-03	8.00E-02
SR-103 Anaheim to PCH	1.00E-01	2.27E-02	8.59E-07	3.38E-04	3.61E-06	5.01E-07	6.19E-03	3.61E-06	5.90E-04	4.01E-06	3.45E-05	6.01E-08	2.50E-06	9.41E-04	4.54E-02
SR-103 PCH to Sepulveda/Willow	1.01E-01	2.28E-02	2.00E-06	3.40E-04	3.63E-06	5.04E-07	6.23E-03	3.63E-06	5.97E-04	4.04E-06	3.47E-05	6.05E-08	2.52E-06	9.44E-04	4.56E-02
E and W Harry Bridges, Figueroa to start Alameda	5.88E-02	2.54E-02	1.79E-06	1.98E-04	2.12E-06	2.94E-07	6.96E-03	2.12E-06	6.65E-04	2.35E-06	2.02E-05	3.53E-08	1.47E-06	1.06E-03	5.09E-02
Alameda beginning (E Harry Bridges) to Anaheim	3.34E-02	1.43E-02	1.69E-06	1.13E-04	1.20E-06	1.67E-07	3.93E-03	1.20E-06	3.77E-04	1.34E-06	1.15E-05	2.01E-08	8.36E-07	5.95E-04	2.87E-02
Alameda Anaheim to Henry Ford	1.27E-02	5.37E-03	1.20E-06	4.27E-05	4.56E-07	6.34E-08	1.48E-03	4.56E-07	1.44E-04	5.07E-07	4.36E-06	7.61E-09	3.17E-07	2.23E-04	1.08E-02
Alameda, Henry Ford to PCH	2.49E-02	1.08E-02	9.53E-07	8.39E-05	8.97E-07	1.25E-07	2.96E-03	8.97E-07	2.83E-04	9.96E-07	8.57E-06	1.49E-08	6.23E-07	4.48E-04	2.16E-02
Alameda PCH to 405	3.97E-01	2.03E-01	2.04E-05	1.34E-03	1.43E-05	1.98E-06	5.56E-02	1.43E-05	5.33E-03	1.59E-05	1.37E-04	2.38E-07	9.92E-06	8.42E-03	4.06E-01
Alameda 405 to del Amo	2.47E-01	1.06E-01	1.48E-05	8.32E-04	8.89E-06	1.24E-06	2.92E-02	8.89E-06	2.81E-03	9.88E-06	8.50E-05	1.48E-07	6.18E-06	4.41E-03	2.13E-01
Alameda, del Amo to South Santa Fe Avenue	8.57E-02	3.64E-02	6.68E-06	2.89E-04	3.09E-06	4.29E-07	1.00E-02	3.09E-06	9.68E-04	3.43E-06	2.95E-05	5.14E-08	2.14E-06	1.51E-03	7.29E-02
Alameda, South Santa Fe Avenue to SR-91	8.62E-02	3.70E-02	5.82E-06	2.90E-04	3.10E-06	4.31E-07	1.02E-02	3.10E-06	9.81E-04	3.45E-06	2.97E-05	5.17E-08	2.16E-06	1.54E-03	7.42E-02
I-110, "C" Street Interchange to Anaheim	8.82E-02	2.49E-02	4.81E-06	2.97E-04	3.17E-06	4.41E-07	6.85E-03	3.17E-06	6.62E-04	3.53E-06	3.03E-05	5.29E-08	2.20E-06	1.03E-03	4.98E-02
I-110, Anaheim to PCH	1.47E-01	4.15E-02	8.87E-06	4.96E-04	5.30E-06	7.36E-07	1.14E-02	5.30E-06	1.11E-03	5.89E-06	5.07E-05	8.84E-08	3.68E-06	1.72E-03	8.31E-02
1-110, PCH to Sepulveda	2.70E-01	7.58E-02	2.01E-05	9.10E-04	9.72E-06	1.35E-06	2.10E-02	9.72E-06	2.04E-03	1.08E-05	9.29E-05	1.62E-07	6.75E-06	3.14E-03	1.52E-01
I-110, Sepulveda to Carson	3.05E-01	8.52E-02	3.15E-05	1.03E-03	1.10E-05	1.53E-06	2.38E-02	1.10E-05	2.33E-03	1.22E-05	1.05E-04	1.83E-07	7.63E-06	3.53E-03	1.71E-01
I-110, Carson to Del Amo	1.95E-01	5.42E-02	2.17E-05	6.55E-04	7.00E-06	9.73E-07	1.51E-02	7.00E-06	1.49E-03	7.78E-06	6.69E-05	1.17E-07	4.86E-06	2.25E-03	1.09E-01
I-110, Del Amo to 405	1.44E-01	4.00E-02	1.98E-05	4.86E-04	5.19E-06	7.21E-07	1.12E-02	5.19E-06	1.11E-03	5.77E-06	4.96E-05	8.65E-08	3.61E-06	1.66E-03	8.01E-02
I-110, 405 to SR-91	2.17E-01	5.92E-02	4.32E-05	7.30E-04	7.80E-06	1.08E-06	1.69E-02	7.80E-06	1.71E-03	8.66E-06	7.45E-05	1.30E-07	5.41E-06	2.45E-03	1.19E-01
I-710, Anaheim to PCH	1.89E-01	6.67E-02	4.29E-06	6.37E-04	6.81E-06	9.45E-07	1.82E-02	6.81E-06	1.74E-03	7.56E-06	6.50E-05	1.13E-07	4.73E-06	2.77E-03	1.34E-01
I-710, PCH to Willow	3.91E-01	1.38E-01	9.58E-06	1.32E-03	1.41E-05	1.96E-06	3.77E-02	1.41E-05	3.60E-03	1.57E-05	1.35E-04	2.35E-07	9.78E-06	5.72E-03	2.76E-01
I-710, Willow to 405	5.92E-01	2.09E-01	1.56E-05	2.00E-03	2.13E-05	2.96E-06	5.71E-02	2.13E-05	5.46E-03	2.37E-05	2.04E-04	3.55E-07	1.48E-05	8.66E-03	4.18E-01
I-710, 405 to Del Amo	5.34E-01	1.87E-01	2.59E-05	1.80E-03	1.92E-05	2.67E-06	5.14E-02	1.92E-05	4.94E-03	2.14E-05	1.84E-04	3.20E-07	1.33E-05	7.76E-03	3.74E-01
I-710, Del Amo to Long Beach Blvd Interchange	4.32E-01	1.51E-01	2.27E-05	1.46E-03	1.56E-05	2.16E-06	4.16E-02	1.56E-05	4.00E-03	1.73E-05	1.49E-04	2.59E-07	1.08E-05	6.28E-03	3.03E-01
I-710, Long Beach Boulevard to SR-91	3.72E-01	1.29E-01	2.87E-05	1.25E-03	1.34E-05	1.86E-06	3.58E-02	1.34E-05	3.46E-03	1.49E-05	1.28E-04	2.23E-07	9.31E-06	5.37E-03	2.59E-01
PCH, I110 to Alameda	8.69E-02	5.33E-02	2.80E-05	2.93E-04	3.13E-06	4.34E-07	1.50E-02	3.13E-06	1.49E-03	3.48E-06	2.99E-05	5.21E-08	2.17E-06	2.21E-03	1.07E-01
PCH, Alameda to SR-103	1.51E-02	8.46E-03	9.74E-06	5.10E-05	5.45E-07	7.57E-08	2.48E-03	5.45E-07	2.58E-04	6.05E-07	5.21E-06	9.08E-09	3.78E-07	3.50E-04	1.70E-02
PCH, SR-103 to I-710	6.98E-02	4.53E-02	7.88E-06	2.35E-04	2.51E-06	3.49E-07	1.25E-02	2.51E-06	1.20E-03	2.79E-06	2.40E-05	4.19E-08	1.74E-06	1.88E-03	9.06E-02
Sepulveda, I-110 to Avalon	1.55E-02	7.99E-03	8.22E-06	5.22E-05	5.58E-07	7.75E-08	2.32E-03	5.58E-07	2.40E-04	6.20E-07	5.33E-06	9.29E-09	3.87E-07	3.31E-04	1.60E-02
Sepulveda, Avalon to Alameda	3.35E-02	1.83E-02	1.18E-05	1.13E-04	1.20E-06	1.67E-07	5.20E-03	1.20E-06	5.21E-04	1.34E-06	1.15E-05	2.01E-08	8.37E-07	7.59E-04	3.68E-02
Sepulveda, Alameda to ICTF	2.23E-02	1.33E-02	1.69E-06	7.51E-05	8.03E-07	1.11E-07	3.64E-03	8.03E-07	3.50E-04	8.92E-07	7.67E-06	1.34E-08	5.57E-07	5.50E-04	2.66E-02
Sepulveda, ICTF to SR-103	1.14E-02	6.87E-03	3.50E-07	3.85E-05	4.11E-07	5.71E-08	1.88E-03	4.11E-07	1.79E-04	4.57E-07	3.93E-06	6.85E-09	2.86E-07	2.85E-04	1.37E-02
Del Amo, I-110 to Wilmington	2.87E-02	1.46E-02	1.66E-05	9.67E-05	1.03E-06	1.44E-07	4.26E-03	1.03E-06	4.44E-04	1.15E-06	9.88E-06	1.72E-08	7.18E-07	6.02E-04	2.93E-02
Del Amo, Wilminton to Alameda	1.37E-02	6.64E-03	9.14E-06	4.60E-05	4.92E-07	6.83E-08	1.97E-03	4.92E-07	2.09E-04	5.46E-07	4.70E-06	8.20E-09	3.41E-07	2.74E-04	1.34E-02
Del Amo, Alameda to I-710	1.69E-02	8.24E-03	1.13E-05	5.71E-05	6.10E-07	8.47E-08	2.45E-03	6.10E-07	2.59E-04	6.78E-07	5.83E-06	1.02E-08	4.23E-07	3.41E-04	1.66E-02
223rd Street, I-110 to Avalon	1.02E-02	4.54E-03	9.53E-06	3.44E-05	3.67E-07	5.10E-08	1.41E-03	3.67E-07	1.56E-04	4.08E-07	3.51E-06	6.12E-09	2.55E-07	1.88E-04	9.17E-03
223rd Street, Avalon to Wilmington	9.63E-03	4.39E-03	8.48E-06	3.25E-05	3.47E-07	4.82E-08	1.35E-03	3.47E-07	1.48E-04	3.85E-07	3.31E-06	5.78E-09	2.41E-07	1.81E-04	8.86E-03
223rd Street, Wilmington to Alameda	1.36E-02	6.55E-03	9.37E-06	4.58E-05	4.89E-07	6.79E-08	1.95E-03	4.89E-07	2.07E-04	5.44E-07	4.67E-06	8.15E-09	3.40E-07	2.71E-04	1.32E-02
W Wardlow from Alameda to I-710	3.72E-02	2.00E-02	1.57E-05	1.25E-04	1.34E-06	1.86E-07	5.74E-03	1.34E-06	5.82E-04	1.49E-06	1.28E-05	2.23E-08	9.31E-07	8.30E-04	4.02E-02

Table B-11
2030 Alternative 1
Maximum Hourly Truck Emissions

	Maximum Hourly Toxic Emissions from Trucks (continued)														
	n-Hexane	Lead	Manganese	MEK	Mercury	Methanol	Nickel	Propylene	Selenium	Sthrene	Sulfates	Toluene	Vanadium	Xylene	Zinc
	110543	7439921	7439965	78933	7439976	67561	7440020	115071	7782492	100425	9960	108883	7440622	1330207	7440666
Alternative 1, 2030	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to Transition															
New Dock Ramps - Cerritos Channel (A1 Line)	4.39E-04	3.80E-06	3.62E-06	4.13E-03	2.72E-06	8.39E-05	1.72E-06	7.26E-03	9.06E-07	1.62E-04	1.58E-03	4.12E-03	2.63E-06	2.91E-03	3.97E-05
SB Cerritos Channel - Transition (G1 Line)	1.19E-04	1.03E-06	9.81E-07	1.12E-03	7.36E-07	2.27E-05	4.66E-07	1.97E-03	2.45E-07	4.39E-05	4.27E-04	1.12E-03	7.12E-07	7.88E-04	1.07E-05
NB Cerritos Channel - Transition (E1 Line)	1.37E-04	1.19E-06	1.13E-06	1.29E-03	8.49E-07	2.62E-05	5.38E-07	2.27E-03	2.83E-07	5.07E-05	4.93E-04	1.29E-03	8.21E-07	9.10E-04	1.24E-05
Mainline Transition to HF Ramps & SR-103															
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	1.13E-04	9.83E-07	9.36E-07	1.06E-03	7.02E-07	2.16E-05	4.45E-07	1.87E-03	2.34E-07	4.18E-05	4.07E-04	1.06E-03	6.79E-07	7.50E-04	1.03E-05
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	9.84E-05	8.55E-07	8.14E-07	9.25E-04	6.11E-07	1.88E-05	3.87E-07	1.63E-03	2.04E-07	3.63E-05	3.54E-04	9.23E-04	5.90E-07	6.52E-04	8.92E-06
Henry Ford Ramps	1.35E-04	3.94E-07	3.76E-07	1.27E-03	2.82E-07	2.58E-05	1.78E-07	2.23E-03	9.39E-08	4.99E-05	1.63E-04	1.27E-03	2.72E-07	8.96E-04	4.11E-06
Henry Ford n/o Ramps to Alameda	6.00E-04	1.76E-06	1.68E-06	5.65E-03	1.26E-06	1.15E-04	7.97E-07	9.93E-03	4.19E-07	2.22E-04	7.30E-04	5.63E-03	1.22E-06	3.98E-03	1.84E-05
SR-47 Extension, HF Ramps to Alameda															
SB, 103 Split to Dominguex Channel (D1 Line)	2.96E-04	2.56E-06	2.44E-06	2.79E-03	1.83E-06	5.66E-05	1.16E-06	4.90E-03	6.10E-07	1.09E-04	1.06E-03	2.78E-03	1.77E-06	1.97E-03	2.67E-05
NB, 103 Split to Dominguex Channel (F1 Line)	2.92E-04	2.52E-06	2.40E-06	2.75E-03	1.80E-06	5.58E-05	1.14E-06	4.83E-03	6.01E-07	1.08E-04	1.05E-03	2.74E-03	1.74E-06	1.94E-03	2.63E-05
Dominguez Channel - Alameda (I1 Line)	7.03E-04	6.07E-06	5.78E-06	6.61E-03	4.34E-06	1.34E-04	2.75E-06	1.16E-02	1.45E-06	2.60E-04	2.52E-03	6.59E-03	4.19E-06	4.66E-03	6.33E-05
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	8.54E-04	7.42E-06	7.07E-06	8.03E-03	5.30E-06	1.63E-04	3.36E-06	1.41E-02	1.77E-06	3.15E-04	3.07E-03	8.01E-03	5.12E-06	5.66E-03	7.74E-05
SR-103 Anaheim to PCH	4.84E-04	4.21E-06	4.01E-06	4.56E-03	3.01E-06	9.26E-05	1.90E-06	8.01E-03	1.00E-06	1.79E-04	1.74E-03	4.55E-03	2.91E-06	3.21E-03	4.39E-05
SR-103 PCH to Sepulveda/Willow	4.86E-04	4.24E-06	4.04E-06	4.57E-03	3.03E-06	9.29E-05	1.92E-06	8.04E-03	1.01E-06	1.80E-04	1.76E-03	4.56E-03	2.93E-06	3.22E-03	4.42E-05
E and W Harry Bridges, Figueroa to start Alameda	5.43E-04	2.47E-06	2.35E-06	5.11E-03	1.76E-06	1.04E-04	1.12E-06	8.99E-03	5.88E-07	2.01E-04	1.02E-03	5.10E-03	1.71E-06	3.60E-03	2.58E-05
Alameda beginning (E Harry Bridges) to Anaheim	3.06E-04	1.40E-06	1.34E-06	2.88E-03	1.00E-06	5.85E-05	6.35E-07	5.06E-03	3.34E-07	1.13E-04	5.82E-04	2.87E-03	9.70E-07	2.03E-03	1.46E-05
Alameda Anaheim to Henry Ford	1.15E-04	5.32E-07	5.07E-07	1.08E-03	3.80E-07	2.19E-05	2.41E-07	1.90E-03	1.27E-07	4.24E-05	2.21E-04	1.08E-03	3.68E-07	7.60E-04	5.55E-06
Alameda, Henry Ford to PCH	2.31E-04	1.05E-06	9.96E-07	2.17E-03	7.47E-07	4.41E-05	4.73E-07	3.81E-03	2.49E-07	8.52E-05	4.33E-04	2.16E-03	7.22E-07	1.53E-03	1.09E-05
Alameda PCH to 405	4.33E-03	1.67E-05	1.59E-05	4.08E-02	1.19E-05	8.28E-04	7.54E-06	7.17E-02	3.97E-06	1.60E-03	6.90E-03	4.07E-02	1.15E-05	2.87E-02	1.74E-04
Alameda 405 to del Amo	2.27E-03	1.04E-05	9.88E-06	2.14E-02	7.41E-06	4.34E-04	4.69E-06	3.76E-02	2.47E-06	8.39E-04	4.30E-03	2.13E-02	7.16E-06	1.51E-02	1.08E-04
Alameda, del Amo to South Santa Fe Avenue	7.77E-04	3.60E-06	3.43E-06	7.31E-03	2.57E-06	1.48E-04	1.63E-06	1.28E-02	8.57E-07	2.87E-04	1.49E-03	7.29E-03	2.49E-06	5.15E-03	3.75E-05
Alameda, South Santa Fe Avenue to SR-91	7.91E-04	3.62E-06	3.45E-06	7.44E-03	2.59E-06	1.51E-04	1.64E-06	1.31E-02	8.62E-07	2.92E-04	1.50E-03	7.42E-03	2.50E-06	5.24E-03	3.78E-05
I-110, "C" Street Interchange to Anaheim	5.31E-04	3.70E-06	3.53E-06	4.99E-03	2.65E-06	1.01E-04	1.68E-06	8.78E-03	8.82E-07	1.96E-04	1.53E-03	4.98E-03	2.56E-06	3.52E-03	3.86E-05
I-110, Anaheim to PCH	8.85E-04	6.19E-06	5.89E-06	8.33E-03	4.42E-06	1.69E-04	2.80E-06	1.46E-02	1.47E-06	3.27E-04	2.56E-03	8.30E-03	4.27E-06	5.87E-03	6.45E-05
1-110, PCH to Sepulveda	1.62E-03	1.13E-05	1.08E-05	1.52E-02	8.10E-06	3.09E-04	5.13E-06	2.68E-02	2.70E-06	5.98E-04	4.70E-03	1.52E-02	7.83E-06	1.07E-02	1.18E-04
I-110, Sepulveda to Carson	1.82E-03	1.28E-05	1.22E-05	1.71E-02	9.16E-06	3.47E-04	5.80E-06	3.01E-02	3.05E-06	6.72E-04	5.31E-03	1.71E-02	8.86E-06	1.21E-02	1.34E-04
I-110, Carson to Del Amo	1.16E-03	8.17E-06	7.78E-06	1.09E-02	5.84E-06	2.21E-04	3.70E-06	1.91E-02	1.95E-06	4.27E-04	3.39E-03	1.08E-02	5.64E-06	7.67E-03	8.52E-05
I-110, Del Amo to 405	8.52E-04	6.06E-06	5.77E-06	8.02E-03	4.33E-06	1.63E-04	2.74E-06	1.41E-02	1.44E-06	3.15E-04	2.51E-03	8.00E-03	4.18E-06	5.65E-03	6.32E-05
I-110, 405 to SR-91	1.26E-03	9.10E-06	8.66E-06	1.19E-02	6.50E-06	2.41E-04	4.11E-06	2.09E-02	2.17E-06	4.66E-04	3.77E-03	1.18E-02	6.28E-06	8.37E-03	9.49E-05
I-710, Anaheim to PCH	1.42E-03	7.94E-06	7.56E-06	1.34E-02	5.67E-06	2.72E-04	3.59E-06	2.36E-02	1.89E-06	5.26E-04	3.29E-03	1.34E-02	5.48E-06	9.44E-03	8.28E-05
I-710, PCH to Willow	2.95E-03	1.64E-05	1.57E-05	2.77E-02	1.17E-05	5.63E-04	7.44E-06	4.87E-02	3.91E-06	1.09E-03	6.81E-03	2.76E-02	1.13E-05	1.95E-02	1.71E-04
I-710, Willow to 405	4.46E-03	2.49E-05	2.37E-05	4.19E-02	1.78E-05	8.52E-04	1.13E-05	7.37E-02	5.92E-06	1.65E-03	1.03E-02	4.18E-02	1.72E-05	2.96E-02	2.59E-04
I-710, 405 to Del Amo	3.99E-03	2.24E-05	2.14E-05	3.76E-02	1.60E-05	7.63E-04	1.01E-05	6.60E-02	5.34E-06	1.47E-03	9.29E-03	3.75E-02	1.55E-05	2.65E-02	2.34E-04
I-710, Del Amo to Long Beach Blvd Interchange	3.23E-03	1.82E-05	1.73E-05	3.04E-02	1.30E-05	6.17E-04	8.22E-06	5.34E-02	4.32E-06	1.19E-03	7.52E-03	3.03E-02	1.25E-05	2.14E-02	1.89E-04
I-710, Long Beach Boulevard to SR-91	2.76E-03	1.56E-05	1.49E-05	2.60E-02	1.12E-05	5.28E-04	7.08E-06	4.57E-02	3.72E-06	1.02E-03	6.48E-03	2.59E-02	1.08E-05	1.83E-02	1.63E-04
PCH, I110 to Alameda	1.14E-03	3.65E-06	3.48E-06	1.07E-02	2.61E-06	2.17E-04	1.65E-06	1.88E-02	8.69E-07	4.20E-04	1.51E-03	1.07E-02	2.52E-06	7.54E-03	3.81E-05
PCH, Alameda to SR-103	1.80E-04	6.36E-07	6.05E-07	1.70E-03	4.54E-07	3.44E-05	2.88E-07	2.98E-03	1.51E-07	6.66E-05	2.63E-04	1.69E-03	4.39E-07	1.19E-03	6.63E-06
PCH, SR-103 to I-710	9.66E-04	2.93E-06	2.79E-06	9.09E-03	2.09E-06	1.85E-04	1.33E-06	1.60E-02	6.98E-07	3.57E-04	1.21E-03	9.06E-03	2.02E-06	6.40E-03	3.06E-05
Sepulveda, I-110 to Avalon	1.70E-04	6.51E-07	6.20E-07	1.60E-03	4.65E-07	3.25E-05	2.94E-07	2.81E-03	1.55E-07	6.29E-05	2.70E-04	1.60E-03	4.49E-07	1.13E-03	6.79E-06
Sepulveda, Avalon to Alameda	3.91E-04	1.41E-06	1.34E-06	3.68E-03	1.00E-06	7.47E-05	6.36E-07	6.46E-03	3.35E-07	1.44E-04	5.82E-04	3.67E-03	9.71E-07	2.59E-03	1.47E-05
Sepulveda, Alameda to ICTF	2.83E-04	9.37E-07	8.92E-07	2.66E-03	6.69E-07	5.41E-05	4.24E-07	4.68E-03	2.23E-07	1.05E-04	3.88E-04	2.66E-03	6.47E-07	1.88E-03	9.77E-06
Sepulveda, ICTF to SR-103	1.47E-04	4.80E-07	4.57E-07	1.38E-03	3.43E-07	2.80E-05	2.17E-07	2.43E-03	1.14E-07	5.42E-05	1.99E-04	1.38E-03	3.31E-07	9.72E-04	5.00E-06
Del Amo, I-110 to Wilmington	3.10E-04	1.21E-06	1.15E-06	2.92E-03	8.61E-07	5.92E-05	5.45E-07	5.13E-03	2.87E-07	1.15E-04	5.00E-04	2.91E-03	8.33E-07	2.06E-03	1.26E-05
Del Amo, Wilminton to Alameda	1.41E-04	5.74E-07	5.46E-07	1.33E-03	4.10E-07	2.70E-05	2.60E-07	2.34E-03	1.37E-07	5.22E-05	2.38E-04	1.33E-03	3.96E-07	9.37E-04	5.98E-06
Del Amo, Alameda to I-710	1.75E-04	7.11E-07	6.78E-07	1.65E-03	5.08E-07	3.35E-05	3.22E-07	2.90E-03	1.69E-07	6.48E-05	2.95E-04	1.64E-03	4.91E-07	1.16E-03	7.42E-06
223rd Street, I-110 to Avalon	9.66E-05	4.28E-07	4.08E-07	9.09E-04	3.06E-07	1.85E-05	1.94E-07	1.60E-03	1.02E-07	3.57E-05	1.77E-04	9.06E-04	2.96E-07	6.40E-04	4.47E-06
223rd Street, Avalon to Wilmington	9.34E-05	4.05E-07	3.85E-07	8.79E-04	2.89E-07	1.78E-05	1.83E-07	1.55E-03	9.63E-08	3.45E-05	1.68E-04	8.76E-04	2.79E-07	6.19E-04	4.22E-06
223rd Street, Wilmington to Alameda	1.39E-04	5.71E-07	5.44E-07	1.31E-03	4.08E-07	2.66E-05	2.58E-07	2.31E-03	1.36E-07	5.15E-05	2.36E-04	1.31E-03	3.94E-07	9.24E-04	5.95E-06
W Wardlow from Alameda to I-710	4.27E-04	1.56E-06	1.49E-06	4.02E-03	1.12E-06	8.16E-05	7.07E-07	7.07E-03	3.72E-07	1.58E-04	6.48E-04	4.01E-03	1.08E-06	2.83E-03	1.63E-05

Table B-11
2030 Alternative 1
Maximum Hourly Truck Emissions

	Port Trucks - - LNG Exhaust								Port Trucks - - LNG Exhaust								
	TOG	Acetaldehyde	Benzene	Formaldehyde	n-Hexane	Propylene	Toluene	Xylenes	PM10	Bromine	Chlorine	Chromium (hex)	Copper	Manganese	Nickel	Sulfates	Zinc
		75070	71432	50000	110543	115071	108883	1330207		7726956	7782505	18540299	7440508	7439965	7440020	9960	7440666
Alternative 1, 2030	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to Transition																	
New Dock Ramps - Cerritos Channel (A1 Line)	2.28E-01	6.85E-05	2.51E-04	1.85E-03	4.56E-05	3.86E-03	9.13E-05	4.56E-05	0.052	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SB Cerritos Channel - Transition (G1 Line)	6.18E-02	1.85E-05	6.80E-05	5.01E-04	1.24E-05	1.04E-03	2.47E-05	1.24E-05	0.014	3.56E-10	4.98E-08	1.78E-11	3.56E-10	3.56E-10	3.56E-10	3.20E-07	3.56E-10
NB Cerritos Channel - Transition (E1 Line)	7.13E-02	2.14E-05	7.84E-05	5.78E-04	1.43E-05	1.21E-03	2.85E-05	1.43E-05	0.016	4.11E-10	5.75E-08	2.05E-11	4.11E-10	4.11E-10	4.11E-10	3.69E-07	4.11E-10
Mainline Transition to HF Ramps & SR-103	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	4.64E-02	1.39E-05	5.10E-05	3.76E-04	9.27E-06	7.84E-04	1.85E-05	9.27E-06	0.011	3.39E-10	4.75E-08	1.70E-11	3.39E-10	3.39E-10	3.39E-10	3.06E-07	3.39E-10
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	4.03E-02	1.21E-05	4.43E-05	3.27E-04	8.06E-06	6.81E-04	1.61E-05	8.06E-06	0.009	2.95E-10	4.13E-08	1.48E-11	2.95E-10	2.95E-10	2.95E-10	2.66E-07	2.95E-10
Henry Ford Ramps	2.33E-02	6.98E-06	2.56E-05	1.88E-04	4.65E-06	3.93E-04	9.30E-06	4.65E-06	0.005	1.36E-10	1.91E-08	6.81E-12	1.36E-10	1.36E-10	1.36E-10	1.23E-07	1.36E-10
Henry Ford n/o Ramps to Alameda	8.24E-02	2.47E-05	9.06E-05	6.67E-04	1.65E-05	1.39E-03	3.30E-05	1.65E-05	0.019	6.08E-10	8.51E-08	3.04E-11	6.08E-10	6.08E-10	6.08E-10	5.47E-07	6.08E-10
SR-47 Extension, HF Ramps to Alameda	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB, 103 Split to Dominguex Channel (D1 Line)	1.92E-01	5.75E-05	2.11E-04	1.55E-03	3.84E-05	3.24E-03	7.67E-05	3.84E-05	0.044	8.84E-10	1.24E-07	4.42E-11	8.84E-10	8.84E-10	8.84E-10	7.95E-07	8.84E-10
NB, 103 Split to Dominguex Channel (F1 Line)	1.89E-01	5.67E-05	2.08E-04	1.53E-03	3.78E-05	3.20E-03	7.56E-05	3.78E-05	0.043	8.71E-10	1.22E-07	4.36E-11	8.71E-10	8.71E-10	8.71E-10	7.84E-07	8.71E-10
Dominguez Channel - Alameda (I1 Line)	4.55E-01	1.36E-04	5.00E-04	3.68E-03	9.10E-05	7.69E-03	1.82E-04	9.10E-05	0.104	2.10E-09	2.93E-07	1.05E-10	2.10E-09	2.10E-09	2.10E-09	1.89E-06	2.10E-09
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	3.61E-01	1.08E-04	3.97E-04	2.92E-03	7.22E-05	6.10E-03	1.44E-04	7.22E-05	0.082	2.56E-09	3.59E-07	1.28E-10	2.56E-09	2.56E-09	2.56E-09	2.31E-06	2.56E-09
SR-103 Anaheim to PCH	2.27E-01	6.81E-05	2.50E-04	1.84E-03	4.54E-05	3.83E-03	9.07E-05	4.54E-05	0.052	1.45E-09	2.03E-07	7.26E-11	1.45E-09	1.45E-09	1.45E-09	1.31E-06	1.45E-09
SR-103 PCH to Sepulveda/Willow	1.82E-01	5.45E-05	2.00E-04	1.47E-03	3.63E-05	3.07E-03	7.27E-05	3.63E-05	0.041	1.46E-09	2.05E-07	7.31E-11	1.46E-09	1.46E-09	1.46E-09	1.32E-06	1.46E-09
E and W Harry Bridges, Figueroa to start Alameda	2.60E-01	7.79E-05	2.86E-04	2.10E-03	5.19E-05	4.39E-03	1.04E-04	5.19E-05	0.059	8.53E-10	1.19E-07	4.26E-11	8.53E-10	8.53E-10	8.53E-10	7.67E-07	8.53E-10
Alameda beginning (E Harry Bridges) to Anaheim	1.77E-01	5.30E-05	1.94E-04	1.43E-03	3.53E-05	2.98E-03	7.06E-05	3.53E-05	0.040	4.85E-10	6.79E-08	2.42E-11	4.85E-10	4.85E-10	4.85E-10	4.36E-07	4.85E-10
Alameda Anaheim to Henry Ford	5.98E-02	1.80E-05	6.58E-05	4.85E-04	1.20E-05	1.01E-03	2.39E-05	1.20E-05	0.014	1.84E-10	2.57E-08	9.19E-12	1.84E-10	1.84E-10	1.84E-10	1.65E-07	1.84E-10
Alameda, Henry Ford to PCH	7.93E-02	2.38E-05	8.72E-05	6.42E-04	1.59E-05	1.34E-03	3.17E-05	1.59E-05	0.018	3.61E-10	5.06E-08	1.81E-11	3.61E-10	3.61E-10	3.61E-10	3.25E-07	3.61E-10
Alameda PCH to 405	1.61E+00	4.83E-04	1.77E-03	1.30E-02	3.22E-04	2.72E-02	6.44E-04	3.22E-04	0.367	5.75E-09	8.06E-07	2.88E-10	5.75E-09	5.75E-09	5.75E-09	5.18E-06	5.75E-09
Alameda 405 to del Amo	7.90E-01	2.37E-04	8.69E-04	6.40E-03	1.58E-04	1.34E-02	3.16E-04	1.58E-04	0.180	3.58E-09	5.01E-07	1.79E-10	3.58E-09	3.58E-09	3.58E-09	3.22E-06	3.58E-09
Alameda, del Amo to South Santa Fe Avenue	4.92E-01	1.48E-04	5.41E-04	3.98E-03	9.84E-05	8.31E-03	1.97E-04	9.84E-05	0.112	1.24E-09	1.74E-07	6.22E-11	1.24E-09	1.24E-09	1.24E-09	1.12E-06	1.24E-09
Alameda, South Santa Fe Avenue to SR-91	2.79E-01	8.37E-05	3.07E-04	2.26E-03	5.58E-05	4.71E-03	1.12E-04	5.58E-05	0.064	1.25E-09	1.75E-07	6.25E-11	1.25E-09	1.25E-09	1.25E-09	1.13E-06	1.25E-09
I-110, "C" Street Interchange to Anaheim	2.94E-01	8.81E-05	3.23E-04	2.38E-03	5.87E-05	4.96E-03	1.17E-04	5.87E-05	0.067	1.28E-09	1.79E-07	6.39E-11	1.28E-09	1.28E-09	1.28E-09	1.15E-06	1.28E-09
I-110, Anaheim to PCH	4.82E-01	1.45E-04	5.30E-04	3.90E-03	9.63E-05	8.14E-03	1.93E-04	9.63E-05	0.110	2.14E-09	2.99E-07	1.07E-10	2.14E-09	2.14E-09	2.14E-09	1.92E-06	2.14E-09
1-110, PCH to Sepulveda	8.63E-01	2.59E-04	9.49E-04	6.99E-03	1.73E-04	1.46E-02	3.45E-04	1.73E-04	0.197	3.92E-09	5.48E-07	1.96E-10	3.92E-09	3.92E-09	3.92E-09	3.53E-06	3.92E-09
I-110, Sepulveda to Carson	9.18E-01	2.75E-04	1.01E-03	7.44E-03	1.84E-04	1.55E-02	3.67E-04	1.84E-04	0.209	4.43E-09	6.20E-07	2.21E-10	4.43E-09	4.43E-09	4.43E-09	3.99E-06	4.43E-09
I-110, Carson to Del Amo	5.81E-01	1.74E-04	6.39E-04	4.70E-03	1.16E-04	9.81E-03	2.32E-04	1.16E-04	0.132	2.82E-09	3.95E-07	1.41E-10	2.82E-09	2.82E-09	2.82E-09	2.54E-06	2.82E-09
I-110, Del Amo to 405	4.08E-01	1.22E-04	4.49E-04	3.30E-03	8.16E-05	6.90E-03	1.63E-04	8.16E-05	0.093	2.09E-09	2.93E-07	1.05E-10	2.09E-09	2.09E-09	2.09E-09	1.88E-06	2.09E-09
I-110, 405 to SR-91	5.35E-01	1.61E-04	5.89E-04	4.34E-03	1.07E-04	9.05E-03	2.14E-04	1.07E-04	0.122	3.14E-09	4.40E-07	1.57E-10	3.14E-09	3.14E-09	3.14E-09	2.83E-06	3.14E-09
I-710, Anaheim to PCH	6.36E-01	1.91E-04	7.00E-04	5.15E-03	1.27E-04	1.07E-02	2.54E-04	1.27E-04	0.145	2.74E-09	3.84E-07	1.37E-10	2.74E-09	2.74E-09	2.74E-09	2.47E-06	2.74E-09
I-710, PCH to Willow	1.40E+00	4.19E-04	1.54E-03	1.13E-02	2.80E-04	2.36E-02	5.59E-04	2.80E-04	0.319	5.67E-09	7.94E-07	2.84E-10	5.67E-09	5.67E-09	5.67E-09	5.11E-06	5.67E-09
I-710, Willow to 405	2.11E+00	6.32E-04	2.32E-03	1.71E-02	4.22E-04	3.56E-02	8.43E-04	4.22E-04	0.481	8.59E-09	1.20E-06	4.29E-10	8.59E-09	8.59E-09	8.59E-09	7.73E-06	8.59E-09
I-710, 405 to Del Amo	1.84E+00	5.51E-04	2.02E-03	1.49E-02	3.68E-04	3.11E-02	7.35E-04	3.68E-04	0.419	7.74E-09	1.08E-06	3.87E-10	7.74E-09	7.74E-09	7.74E-09	6.97E-06	7.74E-09
I-710, Del Amo to Long Beach Blvd Interchange	1.50E+00	4.50E-04	1.65E-03	1.21E-02	3.00E-04	2.53E-02	6.00E-04	3.00E-04	0.342	6.27E-09	8.78E-07	3.14E-10	6.27E-09	6.27E-09	6.27E-09	5.64E-06	6.27E-09
I-710, Long Beach Boulevard to SR-91	1.21E+00	3.64E-04	1.34E-03	9.84E-03	2.43E-04	2.05E-02	4.86E-04	2.43E-04	0.277	5.40E-09	7.56E-07	2.70E-10	5.40E-09	5.40E-09	5.40E-09	4.86E-06	5.40E-09
PCH, I110 to Alameda	2.55E-01	7.66E-05	2.81E-04	2.07E-03	5.11E-05	4.32E-03	1.02E-04	5.11E-05	0.058	1.26E-09	1.76E-07	6.30E-11	1.26E-09	1.26E-09	1.26E-09	1.13E-06	1.26E-09
PCH, Alameda to SR-103	2.68E-02	8.04E-06	2.95E-05	2.17E-04	5.36E-06	4.53E-04	1.07E-05	5.36E-06	0.006	2.19E-10	3.07E-08	1.10E-11	2.19E-10	2.19E-10	2.19E-10	1.98E-07	2.19E-10
PCH, SR-103 to I-710	2.76E-01	8.27E-05	3.03E-04	2.23E-03	5.51E-05	4.66E-03	1.10E-04	5.51E-05	0.063	1.01E-09	1.42E-07	5.06E-11	1.01E-09	1.01E-09	1.01E-09	9.11E-07	1.01E-09
Sepulveda, I-110 to Avalon	2.07E-02	6.20E-06	2.27E-05	1.67E-04	4.13E-06	3.49E-04	8.26E-06	4.13E-06	0.005	2.25E-10	3.14E-08	1.12E-11	2.25E-10	2.25E-10	2.25E-10	2.02E-07	2.25E-10
Sepulveda, Avalon to Alameda	4.91E-02	1.47E-05	5.40E-05	3.98E-04	9.82E-06	8.29E-04	1.96E-05	9.82E-06	0.011	4.85E-10	6.79E-08	2.43E-11	4.85E-10	4.85E-10	4.85E-10	4.37E-07	4.85E-10
Sepulveda, Alameda to ICTF	5.03E-02	1.51E-05	5.53E-05	4.08E-04	1.01E-05	8.50E-04	2.01E-05	1.01E-05	0.011	3.23E-10	4.53E-08	1.62E-11	3.23E-10	3.23E-10	3.23E-10	2.91E-07	3.23E-10
Sepulveda, ICTF to SR-103	3.05E-02	9.16E-06	3.36E-05	2.47E-04	6.10E-06	5.16E-04	1.22E-05	6.10E-06	0.007	1.66E-10	2.32E-08	8.28E-12	1.66E-10	1.66E-10	1.66E-10	1.49E-07	1.66E-10
Del Amo, I-110 to Wilmington	3.70E-02	1.11E-05	4.07E-05	3.00E-04	7.40E-06	6.25E-04	1.48E-05	7.40E-06	0.008	4.16E-10	5.83E-08	2.08E-11	4.16E-10	4.16E-10	4.16E-10	3.75E-07	4.16E-10
Del Amo, Wilminton to Alameda	3.53E-02	1.06E-05	3.89E-05	2.86E-04	7.06E-06	5.97E-04	1.41E-05	7.06E-06	0.008	1.98E-10	2.77E-08	9.90E-12	1.98E-10	1.98E-10	1.98E-10	1.78E-07	1.98E-10
Del Amo, Alameda to I-710	4.25E-02	1.27E-05	4.67E-05	3.44E-04	8.50E-06	7.18E-04	1.70E-05	8.50E-06	0.010	2.46E-10	3.44E-08	1.23E-11	2.46E-10	2.46E-10	2.46E-10	2.21E-07	2.46E-10
223rd Street, I-110 to Avalon	4.11E-03	1.23E-06	4.53E-06	3.33E-05	8.23E-07	6.95E-05	1.65E-06	8.23E-07	0.001	1.48E-10	2.07E-08	7.40E-12	1.48E-10	1.48E-10	1.48E-10	1.33E-07	1.48E-10
223rd Street, Avalon to Wilmington	1.59E-03	4.76E-07	1.74E-06	1.28E-05	3.17E-07	2.68E-05	6.34E-07	3.17E-07	0.000	1.40E-10	1.96E-08	6.98E-12	1.40E-10	1.40E-10	1.40E-10	1.26E-07	1.40E-10
223rd Street, Wilmington to Alameda	3.71E-02	1.11E-05	4.08E-05	3.00E-04	7.42E-06	6.27E-04	1.48E-05	7.42E-06	0.008	1.97E-10	2.76E-08	9.85E-12	1.97E-10	1.97E-10	1.97E-10	1.77E-07	1.97E-10
W Wardlow from Alameda to I-710	1.79E-02	5.38E-06	1.97E-05	1.45E-04	3.59E-06	3.03E-04	7.17E-06	3.59E-06	0.004	5.40E-10	7.56E-08	2.70E-11	5.40E-10	5.40E-10	5.40E-10	4.86E-07	5.40E-10

Table B-11
2030 Alternative 1
Maximum Hourly Truck Emissions

	Port Trucks - Diesel Exhaust (LNG & Diesel Trucks)												
	TOG	1,3-Butadiene	Acetaldehyde	Benzene	Ethylbenzene	formaldehyde	n-Hexane	Methanol	MEK	Propylene	Sthrene	Toluene	Xylene
		106990	75070	71432	100414	50000	110543	67561	78933	115071	100425	108883	1330207
Alternative 1, 2030	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to Transition													
New Dock Ramps - Cerritos Channel (A1 Line)	2.78E-01	5.29E-04	2.05E-02	5.57E-03	8.49E-04	4.10E-02	4.37E-04	8.35E-05	4.11E-03	7.23E-03	1.62E-04	4.10E-03	2.90E-03
SB Cerritos Channel - Transition (G1 Line)	7.54E-02	1.43E-04	5.55E-03	1.51E-03	2.30E-04	1.11E-02	1.18E-04	2.26E-05	1.11E-03	1.96E-03	4.37E-05	1.11E-03	7.85E-04
NB Cerritos Channel - Transition (E1 Line)	8.70E-02	1.65E-04	6.40E-03	1.74E-03	2.65E-04	1.28E-02	1.37E-04	2.61E-05	1.29E-03	2.26E-03	5.05E-05	1.28E-03	9.06E-04
Mainline Transition to HF Ramps & SR-103													
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	7.16E-02	1.36E-04	5.27E-03	1.43E-03	2.18E-04	1.05E-02	1.12E-04	2.15E-05	1.06E-03	1.86E-03	4.15E-05	1.06E-03	7.46E-04
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	6.23E-02	1.18E-04	4.58E-03	1.25E-03	1.90E-04	9.16E-03	9.78E-05	1.87E-05	9.20E-04	1.62E-03	3.61E-05	9.17E-04	6.48E-04
Henry Ford Ramps	8.56E-02	1.63E-04	6.29E-03	1.71E-03	2.61E-04	1.26E-02	1.34E-04	2.57E-05	1.26E-03	2.22E-03	4.96E-05	1.26E-03	8.91E-04
Henry Ford n/o Ramps to Alameda	3.76E-01	7.14E-04	2.76E-02	7.52E-03	1.15E-03	5.53E-02	5.90E-04	1.13E-04	5.55E-03	9.75E-03	2.18E-04	5.53E-03	3.91E-03
SR-47 Extension, HF Ramps to Alameda													
SB, 103 Split to Dominguex Channel (D1 Line)	1.88E-01	3.58E-04	1.38E-02	3.77E-03	5.74E-04	2.77E-02	2.95E-04	5.65E-05	2.78E-03	4.89E-03	1.09E-04	2.77E-03	1.96E-03
NB, 103 Split to Dominguex Channel (F1 Line)	1.86E-01	3.52E-04	1.36E-02	3.71E-03	5.66E-04	2.73E-02	2.91E-04	5.57E-05	2.74E-03	4.82E-03	1.08E-04	2.73E-03	1.93E-03
Dominguez Channel - Alameda (I1 Line)	4.46E-01	8.48E-04	3.28E-02	8.93E-03	1.36E-03	6.57E-02	7.01E-04	1.34E-04	6.59E-03	1.16E-02	2.59E-04	6.57E-03	4.65E-03
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	5.41E-01	1.03E-03	3.97E-02	1.08E-02	1.65E-03	7.95E-02	8.49E-04	1.62E-04	7.98E-03	1.40E-02	3.13E-04	7.96E-03	5.63E-03
SR-103 Anaheim to PCH	3.04E-01	5.77E-04	2.23E-02	6.07E-03	9.26E-04	4.47E-02	4.77E-04	9.11E-05	4.48E-03	7.88E-03	1.76E-04	4.47E-03	3.16E-03
SR-103 PCH to Sepulveda/Willow	2.98E-01	5.66E-04	2.19E-02	5.96E-03	9.09E-04	4.38E-02	4.68E-04	8.94E-05	4.40E-03	7.74E-03	1.73E-04	4.39E-03	3.10E-03
E and W Harry Bridges, Figueroa to start Alameda	3.36E-01	6.38E-04	2.47E-02	6.72E-03	1.02E-03	4.94E-02	5.28E-04	1.01E-04	4.96E-03	8.73E-03	1.95E-04	4.95E-03	3.50E-03
Alameda beginning (E Harry Bridges) to Anaheim	1.86E-01	3.53E-04	1.36E-02	3.71E-03	5.66E-04	2.73E-02	2.91E-04	5.57E-05	2.74E-03	4.82E-03	1.08E-04	2.73E-03	1.93E-03
Alameda Anaheim to Henry Ford	6.63E-02	1.26E-04	4.87E-03	1.33E-03	2.02E-04	9.75E-03	1.04E-04	1.99E-05	9.79E-04	1.72E-03	3.85E-05	9.77E-04	6.90E-04
Alameda, Henry Ford to PCH	1.42E-01	2.69E-04	1.04E-02	2.83E-03	4.32E-04	2.08E-02	2.22E-04	4.25E-05	2.09E-03	3.68E-03	8.21E-05	2.08E-03	1.47E-03
Alameda PCH to 405	2.66E+00	5.05E-03	1.95E-01	5.31E-02	8.10E-03	3.91E-01	4.17E-03	7.97E-04	3.92E-02	6.90E-02	1.54E-03	3.91E-02	2.77E-02
Alameda 405 to del Amo	1.36E+00	2.59E-03	1.00E-01	2.73E-02	4.16E-03	2.01E-01	2.14E-03	4.09E-04	2.01E-02	3.54E-02	7.91E-04	2.01E-02	1.42E-02
Alameda, del Amo to South Santa Fe Avenue	4.57E-01	8.69E-04	3.36E-02	9.15E-03	1.40E-03	6.73E-02	7.18E-04	1.37E-04	6.76E-03	1.19E-02	2.65E-04	6.74E-03	4.76E-03
Alameda, South Santa Fe Avenue to SR-91	4.71E-01	8.95E-04	3.46E-02	9.43E-03	1.44E-03	6.93E-02	7.40E-04	1.41E-04	6.96E-03	1.22E-02	2.73E-04	6.94E-03	4.90E-03
I-110, "C" Street Interchange to Anaheim	3.10E-01	5.89E-04	2.28E-02	6.20E-03	9.45E-04	4.56E-02	4.86E-04	9.29E-05	4.58E-03	8.04E-03	1.80E-04	4.56E-03	3.22E-03
I-110, Anaheim to PCH	5.12E-01	9.72E-04	3.76E-02	1.02E-02	1.56E-03	7.53E-02	8.03E-04	1.53E-04	7.56E-03	1.33E-02	2.97E-04	7.54E-03	5.33E-03
1-110, PCH to Sepulveda	9.13E-01	1.73E-03	6.71E-02	1.83E-02	2.78E-03	1.34E-01	1.43E-03	2.74E-04	1.35E-02	2.37E-02	5.29E-04	1.34E-02	9.50E-03
I-110, Sepulveda to Carson	9.73E-01	1.85E-03	7.16E-02	1.95E-02	2.97E-03	1.43E-01	1.53E-03	2.92E-04	1.44E-02	2.53E-02	5.65E-04	1.43E-02	1.01E-02
I-110, Carson to Del Amo	6.09E-01	1.16E-03	4.48E-02	1.22E-02	1.86E-03	8.96E-02	9.56E-04	1.83E-04	9.00E-03	1.58E-02	3.53E-04	8.97E-03	6.34E-03
I-110, Del Amo to 405	4.26E-01	8.10E-04	3.13E-02	8.53E-03	1.30E-03	6.27E-02	6.69E-04	1.28E-04	6.30E-03	1.11E-02	2.47E-04	6.28E-03	4.44E-03
I-110, 405 to SR-91	5.50E-01	1.05E-03	4.05E-02	1.10E-02	1.68E-03	8.10E-02	8.64E-04	1.65E-04	8.13E-03	1.43E-02	3.19E-04	8.10E-03	5.73E-03
I-710, Anaheim to PCH	8.82E-01	1.68E-03	6.48E-02	1.76E-02	2.69E-03	1.30E-01	1.38E-03	2.65E-04	1.30E-02	2.29E-02	5.12E-04	1.30E-02	9.18E-03
I-710, PCH to Willow	1.82E+00	3.46E-03	1.34E-01	3.64E-02	5.55E-03	2.68E-01	2.86E-03	5.46E-04	2.69E-02	4.73E-02	1.06E-03	2.68E-02	1.90E-02
I-710, Willow to 405	2.75E+00	5.22E-03	2.02E-01	5.50E-02	8.38E-03	4.04E-01	4.31E-03	8.24E-04	4.06E-02	7.14E-02	1.59E-03	4.05E-02	2.86E-02
I-710, 405 to Del Amo	2.39E+00	4.54E-03	1.76E-01	4.79E-02	7.29E-03	3.52E-01	3.75E-03	7.17E-04	3.53E-02	6.21E-02	1.39E-03	3.52E-02	2.49E-02
I-710, Del Amo to Long Beach Blvd Interchange	1.93E+00	3.66E-03	1.42E-01	3.85E-02	5.87E-03	2.83E-01	3.02E-03	5.78E-04	2.84E-02	5.00E-02	1.12E-03	2.84E-02	2.00E-02
I-710, Long Beach Boulevard to SR-91	1.59E+00	3.03E-03	1.17E-01	3.19E-02	4.86E-03	2.34E-01	2.50E-03	4.78E-04	2.35E-02	4.14E-02	9.24E-04	2.35E-02	1.66E-02
PCH, I110 to Alameda	6.13E-01	1.17E-03	4.51E-02	1.23E-02	1.87E-03	9.03E-02	9.63E-04	1.84E-04	9.06E-03	1.59E-02	3.56E-04	9.03E-03	6.39E-03
PCH, Alameda to SR-103	7.62E-02	1.45E-04	5.60E-03	1.52E-03	2.32E-04	1.12E-02	1.20E-04	2.29E-05	1.13E-03	1.98E-03	4.42E-05	1.12E-03	7.93E-04
PCH, SR-103 to I-710	5.84E-01	1.11E-03	4.29E-02	1.17E-02	1.78E-03	8.59E-02	9.17E-04	1.75E-04	8.63E-03	1.52E-02	3.39E-04	8.60E-03	6.08E-03
Sepulveda, I-110 to Avalon	7.03E-02	1.34E-04	5.17E-03	1.41E-03	2.14E-04	1.03E-02	1.10E-04	2.11E-05	1.04E-03	1.83E-03	4.08E-05	1.04E-03	7.32E-04
Sepulveda, Avalon to Alameda	1.94E-01	3.69E-04	1.43E-02	3.89E-03	5.93E-04	2.86E-02	3.05E-04	5.83E-05	2.87E-03	5.05E-03	1.13E-04	2.86E-03	2.02E-03
Sepulveda, Alameda to ICTF	1.72E-01	3.28E-04	1.27E-02	3.45E-03	5.26E-04	2.54E-02	2.71E-04	5.17E-05	2.55E-03	4.48E-03	1.00E-04	2.54E-03	1.80E-03
Sepulveda, ICTF to SR-103	9.18E-02	1.74E-04	6.75E-03	1.84E-03	2.80E-04	1.35E-02	1.44E-04	2.75E-05	1.36E-03	2.38E-03	5.32E-05	1.35E-03	9.56E-04
Del Amo, I-110 to Wilmington	1.21E-01	2.29E-04	8.87E-03	2.41E-03	3.68E-04	1.78E-02	1.89E-04	3.62E-05	1.78E-03	3.13E-03	7.00E-05	1.78E-03	1.26E-03
Del Amo, Wilminton to Alameda	4.77E-02	9.06E-05	3.51E-03	9.54E-04	1.45E-04	7.02E-03	7.49E-05	1.43E-05	7.04E-04	1.24E-03	2.77E-05	7.02E-04	4.96E-04
Del Amo, Alameda to I-710	5.92E-02	1.12E-04	4.35E-03	1.18E-03	1.81E-04	8.71E-03	9.30E-05	1.78E-05	8.74E-04	1.54E-03	3.43E-05	8.72E-04	6.16E-04
223rd Street, I-110 to Avalon	1.74E-02	3.30E-05	1.28E-03	3.48E-04	5.30E-05	2.56E-03	2.73E-05	5.22E-06	2.57E-04	4.52E-04	1.01E-05	2.56E-04	1.81E-04
223rd Street, Avalon to Wilmington	2.02E-02	3.84E-05	1.49E-03	4.04E-04	6.16E-05	2.97E-03	3.17E-05	6.06E-06	2.98E-04	5.25E-04	1.17E-05	2.97E-04	2.10E-04
223rd Street, Wilmington to Alameda	4.54E-02	8.62E-05	3.34E-03	9.08E-04	1.38E-04	6.68E-03	7.13E-05	1.36E-05	6.70E-04	1.18E-03	2.63E-05	6.68E-04	4.72E-04
W Wardlow from Alameda to I-710	1.99E-01	3.79E-04	1.47E-02	3.99E-03	6.08E-04	2.93E-02	3.13E-04	5.98E-05	2.95E-03	5.18E-03	1.16E-04	2.94E-03	2.08E-03

Table B-11
2030 Alternative 1
Maximum Hourly Truck Emissions

	Port Trucks - Diesel Exhaust (LNG & Diesel Trucks)																	
	DPM	Ammonia	Antimony	Arsenic	Bromine	Bromine	Cadmium	Chlorine	Chromium	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Sulfates	Vanadium	Zinc
		7664417	7440360	7440382	7726956	7726956	7440439	7782505	18540299	7440508	7439921	7439965	7439976	7440020	7782492	9960	7440622	7440666
Alternative 1, 2030	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to Transition																		
New Dock Ramps - Cerritos Channel (A1 Line)	9.02E-02	3.04E-04	3.25E-06	4.51E-07	1.62E-06	1.62E-06	3.61E-06	3.10E-05	5.41E-08	2.25E-06	3.79E-06	3.61E-06	2.71E-06	1.71E-06	9.02E-07	1.57E-03	2.62E-06	3.95E-05
SB Cerritos Channel - Transition (G1 Line)	2.44E-02	8.23E-05	8.79E-07	1.22E-07	4.40E-07	4.40E-07	9.77E-07	8.40E-06	1.47E-08	6.11E-07	1.03E-06	9.77E-07	7.33E-07	4.64E-07	2.44E-07	4.25E-04	7.08E-07	1.07E-05
NB Cerritos Channel - Transition (E1 Line)	2.82E-02	9.50E-05	1.01E-06	1.41E-07	5.07E-07	5.07E-07	1.13E-06	9.70E-06	1.69E-08	7.05E-07	1.18E-06	1.13E-06	8.46E-07	5.36E-07	2.82E-07	4.90E-04	8.17E-07	1.23E-05
Mainline Transition to HF Ramps & SR-103	0.00E+00																	
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	2.33E-02	7.84E-05	8.38E-07	1.16E-07	4.19E-07	4.19E-07	9.31E-07	8.00E-06	1.40E-08	5.82E-07	9.77E-07	9.31E-07	6.98E-07	4.42E-07	2.33E-07	4.05E-04	6.75E-07	1.02E-05
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	2.02E-02	6.82E-05	7.28E-07	1.01E-07	3.64E-07	3.64E-07	8.09E-07	6.96E-06	1.21E-08	5.06E-07	8.50E-07	8.09E-07	6.07E-07	3.84E-07	2.02E-07	3.52E-04	5.87E-07	8.86E-06
Henry Ford Ramps	9.31E-03	3.14E-05	3.35E-07	4.66E-08	1.68E-07	1.68E-07	3.72E-07	3.20E-06	5.59E-09	2.33E-07	3.91E-07	3.72E-07	2.79E-07	1.77E-07	9.31E-08	1.62E-04	2.70E-07	4.08E-06
Henry Ford n/o Ramps to Alameda	4.07E-02	1.37E-04	1.47E-06	2.04E-07	7.33E-07	7.33E-07	1.63E-06	1.40E-05	2.44E-08	1.02E-06	1.71E-06	1.63E-06	1.22E-06	7.74E-07	4.07E-07	7.09E-04	1.18E-06	1.78E-05
SR-47 Extension, HF Ramps to Alameda	0.00E+00																	
SB, 103 Split to Dominguex Channel (D1 Line)	6.08E-02	2.05E-04	2.19E-06	3.04E-07	1.09E-06	1.09E-06	2.43E-06	2.09E-05	3.65E-08	1.52E-06	2.55E-06	2.43E-06	1.82E-06	1.15E-06	6.08E-07	1.06E-03	1.76E-06	2.66E-05
NB, 103 Split to Dominguex Channel (F1 Line)	5.99E-02	2.02E-04	2.16E-06	2.99E-07	1.08E-06	1.08E-06	2.40E-06	2.06E-05	3.59E-08	1.50E-06	2.52E-06	2.40E-06	1.80E-06	1.14E-06	5.99E-07	1.04E-03	1.74E-06	2.62E-05
Dominguez Channel - Alameda (I1 Line)	1.44E-01	4.85E-04	5.19E-06	7.20E-07	2.59E-06	2.59E-06	5.76E-06	4.96E-05	8.64E-08	3.60E-06	6.05E-06	5.76E-06	4.32E-06	2.74E-06	1.44E-06	2.51E-03	4.18E-06	6.31E-05
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.76E-01	5.91E-04	6.32E-06	8.78E-07	3.16E-06	3.16E-06	7.02E-06	6.04E-05	1.05E-07	4.39E-06	7.37E-06	7.02E-06	5.27E-06	3.33E-06	1.76E-06	3.05E-03	5.09E-06	7.69E-05
SR-103 Anaheim to PCH	9.84E-02	3.32E-04	3.54E-06	4.92E-07	1.77E-06	1.77E-06	3.94E-06	3.39E-05	5.91E-08	2.46E-06	4.13E-06	3.94E-06	2.95E-06	1.87E-06	9.84E-07	1.71E-03	2.85E-06	4.31E-05
SR-103 PCH to Sepulveda/Willow	9.68E-02	3.26E-04	3.49E-06	4.84E-07	1.74E-06	1.74E-06	3.87E-06	3.33E-05	5.81E-08	2.42E-06	4.07E-06	3.87E-06	2.90E-06	1.84E-06	9.68E-07	1.68E-03	2.81E-06	4.24E-05
E and W Harry Bridges, Figueroa to start Alameda	5.66E-02	1.91E-04	2.04E-06	2.83E-07	1.02E-06	1.02E-06	2.26E-06	1.95E-05	3.40E-08	1.41E-06	2.38E-06	2.26E-06	1.70E-06	1.08E-06	5.66E-07	9.85E-04	1.64E-06	2.48E-05
Alameda beginning (E Harry Bridges) to Anaheim	3.14E-02	1.06E-04	1.13E-06	1.57E-07	5.65E-07	5.65E-07	1.25E-06	1.08E-05	1.88E-08	7.84E-07	1.32E-06	1.25E-06	9.41E-07	5.96E-07	3.14E-07	5.46E-04	9.10E-07	1.37E-05
Alameda Anaheim to Henry Ford	1.12E-02	3.77E-05	4.03E-07	5.60E-08	2.02E-07	2.02E-07	4.48E-07	3.85E-06	6.72E-09	2.80E-07	4.70E-07	4.48E-07	3.36E-07	2.13E-07	1.12E-07	1.95E-04	3.25E-07	4.90E-06
Alameda, Henry Ford to PCH	2.37E-02	8.00E-05	8.55E-07	1.19E-07	4.27E-07	4.27E-07	9.50E-07	8.17E-06	1.42E-08	5.93E-07	9.97E-07	9.50E-07	7.12E-07	4.51E-07	2.37E-07	4.13E-04	6.88E-07	1.04E-05
Alameda PCH to 405	3.76E-01	1.27E-03	1.35E-05	1.88E-06	6.77E-06	6.77E-06	1.50E-05	1.29E-04	2.26E-07	9.40E-06	1.58E-05	1.50E-05	1.13E-05	7.14E-06	3.76E-06	6.54E-03	1.09E-05	1.65E-04
Alameda 405 to del Amo	2.29E-01	7.71E-04	8.24E-06	1.14E-06	4.12E-06	4.12E-06	9.15E-06	7.87E-05	1.37E-07	5.72E-06	9.61E-06	9.15E-06	6.86E-06	4.35E-06	2.29E-06	3.98E-03	6.63E-06	1.00E-04
Alameda, del Amo to South Santa Fe Avenue	7.75E-02	2.61E-04	2.79E-06	3.88E-07	1.40E-06	1.40E-06	3.10E-06	2.67E-05	4.65E-08	1.94E-06	3.26E-06	3.10E-06	2.33E-06	1.47E-06	7.75E-07	1.35E-03	2.25E-06	3.39E-05
Alameda, South Santa Fe Avenue to SR-91	7.91E-02	2.66E-04	2.85E-06	3.95E-07	1.42E-06	1.42E-06	3.16E-06	2.72E-05	4.74E-08	1.98E-06	3.32E-06	3.16E-06	2.37E-06	1.50E-06	7.91E-07	1.38E-03	2.29E-06	3.46E-05
I-110, "C" Street Interchange to Anaheim	7.99E-02	2.69E-04	2.88E-06	3.99E-07	1.44E-06	1.44E-06	3.19E-06	2.75E-05	4.79E-08	2.00E-06	3.35E-06	3.19E-06	2.40E-06	1.52E-06	7.99E-07	1.39E-03	2.32E-06	3.50E-05
I-110, Anaheim to PCH	1.32E-01	4.44E-04	4.75E-06	6.60E-07	2.37E-06	2.37E-06	5.28E-06	4.54E-05	7.92E-08	3.30E-06	5.54E-06	5.28E-06	3.96E-06	2.51E-06	1.32E-06	2.30E-03	3.83E-06	5.78E-05
1-110, PCH to Sepulveda	2.35E-01	7.93E-04	8.47E-06	1.18E-06	4.24E-06	4.24E-06	9.41E-06	8.09E-05	1.41E-07	5.88E-06	9.88E-06	9.41E-06	7.06E-06	4.47E-06	2.35E-06	4.09E-03	6.82E-06	1.03E-04
I-110, Sepulveda to Carson	2.51E-01	8.46E-04	9.04E-06	1.25E-06	4.52E-06	4.52E-06	1.00E-05	8.63E-05	1.51E-07	6.27E-06	1.05E-05	1.00E-05	7.53E-06	4.77E-06	2.51E-06	4.37E-03	7.28E-06	1.10E-04
I-110, Carson to Del Amo	1.57E-01	5.29E-04	5.65E-06	7.85E-07	2.83E-06	2.83E-06	6.28E-06	5.40E-05	9.42E-08	3.93E-06	6.60E-06	6.28E-06	4.71E-06	2.98E-06	1.57E-06	2.73E-03	4.55E-06	6.88E-05
I-110, Del Amo to 405	1.10E-01	3.70E-04	3.96E-06	5.50E-07	1.98E-06	1.98E-06	4.40E-06	3.78E-05	6.59E-08	2.75E-06	4.62E-06	4.40E-06	3.30E-06	2.09E-06	1.10E-06	1.91E-03	3.19E-06	4.81E-05
I-110, 405 to SR-91	1.42E-01	4.78E-04	5.11E-06	7.09E-07	2.55E-06	2.55E-06	5.67E-06	4.88E-05	8.51E-08	3.55E-06	5.96E-06	5.67E-06	4.26E-06	2.70E-06	1.42E-06	2.47E-03	4.11E-06	6.21E-05
I-710, Anaheim to PCH	1.83E-01	6.16E-04	6.58E-06	9.14E-07	3.29E-06	3.29E-06	7.31E-06	6.29E-05	1.10E-07	4.57E-06	7.67E-06	7.31E-06	5.48E-06	3.47E-06	1.83E-06	3.18E-03	5.30E-06	8.00E-05
I-710, PCH to Willow	3.77E-01	1.27E-03	1.36E-05	1.89E-06	6.79E-06	6.79E-06	1.51E-05	1.30E-04	2.26E-07	9.43E-06	1.58E-05	1.51E-05	1.13E-05	7.17E-06	3.77E-06	6.56E-03	1.09E-05	1.65E-04
I-710, Willow to 405	5.69E-01	1.92E-03	2.05E-05	2.85E-06	1.02E-05	1.02E-05	2.28E-05	1.96E-04	3.42E-07	1.42E-05	2.39E-05	2.28E-05	1.71E-05	1.08E-05	5.69E-06	9.91E-03	1.65E-05	2.49E-04
I-710, 405 to Del Amo	4.96E-01	1.67E-03	1.78E-05	2.48E-06	8.92E-06	8.92E-06	1.98E-05	1.70E-04	2.97E-07	1.24E-05	2.08E-05	1.98E-05	1.49E-05	9.42E-06	4.96E-06	8.62E-03	1.44E-05	2.17E-04
I-710, Del Amo to Long Beach Blvd Interchange	3.99E-01	1.34E-03	1.44E-05	1.99E-06	7.18E-06	7.18E-06	1.60E-05	1.37E-04	2.39E-07	9.97E-06	1.68E-05	1.60E-05	1.20E-05	7.58E-06	3.99E-06	6.94E-03	1.16E-05	1.75E-04
I-710, Long Beach Boulevard to SR-91	3.30E-01	1.11E-03	1.19E-05	1.65E-06	5.94E-06	5.94E-06	1.32E-05	1.14E-04	1.98E-07	8.25E-06	1.39E-05	1.32E-05	9.90E-06	6.27E-06	3.30E-06	5.74E-03	9.57E-06	1.45E-04
PCH, I110 to Alameda	6.73E-02	2.27E-04	2.42E-06	3.37E-07	1.21E-06	1.21E-06	2.69E-06	2.32E-05	4.04E-08	1.68E-06	2.83E-06	2.69E-06	2.02E-06	1.28E-06	6.73E-07	1.17E-03	1.95E-06	2.95E-05
PCH, Alameda to SR-103	8.33E-03	2.81E-05	3.00E-07	4.16E-08	1.50E-07	1.50E-07	3.33E-07	2.87E-06	5.00E-09	2.08E-07	3.50E-07	3.33E-07	2.50E-07	1.58E-07	8.33E-08	1.45E-04	2.42E-07	3.65E-06
PCH, SR-103 to I-710	6.43E-02	2.17E-04	2.31E-06	3.21E-07	1.16E-06	1.16E-06	2.57E-06	2.21E-05	3.86E-08	1.61E-06	2.70E-06	2.57E-06	1.93E-06	1.22E-06	6.43E-07	1.12E-03	1.86E-06	2.82E-05
Sepulveda, I-110 to Avalon	8.51E-03	2.87E-05	3.06E-07	4.25E-08	1.53E-07	1.53E-07	3.40E-07	2.93E-06	5.10E-09	2.13E-07	3.57E-07	3.40E-07	2.55E-07	1.62E-07	8.51E-08	1.48E-04	2.47E-07	3.73E-06
Sepulveda, Avalon to Alameda	2.35E-02	7.91E-05	8.45E-07	1.17E-07	4.22E-07	4.22E-07	9.39E-07	8.07E-06	1.41E-08	5.87E-07	9.86E-07	9.39E-07	7.04E-07	4.46E-07	2.35E-07	4.08E-04	6.81E-07	1.03E-05
Sepulveda, Alameda to ICTF	2.09E-02	7.03E-05	7.51E-07	1.04E-07	3.76E-07	3.76E-07	8.35E-07	7.18E-06	1.25E-08	5.22E-07	8.76E-07	8.35E-07	6.26E-07	3.96E-07	2.09E-07	3.63E-04	6.05E-07	9.14E-06
Sepulveda, ICTF to SR-103	1.11E-02	3.75E-05	4.00E-07	5.56E-08	2.00E-07	2.00E-07	4.45E-07	3.83E-06	6.67E-09	2.78E-07	4.67E-07	4.45E-07	3.34E-07	2.11E-07	1.11E-07	1.94E-04	3.23E-07	4.87E-06
Del Amo, I-110 to Wilmington	1.46E-02	4.92E-05	5.26E-07	7.30E-08	2.63E-07	2.63E-07	5.84E-07	5.02E-06	8.76E-09	3.65E-07	6.13E-07	5.84E-07	4.38E-07	2.77E-07	1.46E-07	2.54E-04	4.24E-07	6.40E-06
Del Amo, Wilminton to Alameda	5.89E-03	1.98E-05	2.12E-07	2.94E-08	1.06E-07	1.06E-07	2.36E-07	2.03E-06	3.53E-09	1.47E-07	2.47E-07	2.36E-07	1.77E-07	1.12E-07	5.89E-08	1.02E-04	1.71E-07	2.58E-06
Del Amo, Alameda to I-710	7.31E-03	2.46E-05	2.63E-07	3.65E-08	1.31E-07	1.31E-07	2.92E-07	2.51E-06	4.38E-09	1.83E-07	3.07E-07	2.92E-07	2.19E-07	1.39E-07	7.31E-08	1.27E-04	2.12E-07	3.20E-06
223rd Street, I-110 to Avalon	2.10E-03	7.07E-06	7.55E-08	1.05E-08	3.78E-08	3.78E-08	8.39E-08	7.22E-07	1.26E-09	5.24E-08	8.81E-08	8.39E-08	6.29E-08	3.99E-08	2.10E-08	3.65E-05	6.08E-08	9.19E-07
223rd Street, Avalon to Wilmington	2.42E-03	8.15E-06	8.71E-08	1.21E-08	4.35E-08	4.35E-08	9.67E-08	8.32E-07	1.45E-09	6.05E-08	1.02E-07	9.67E-08	7.25E-08	4.59E-08	2.42E-08	4.21E-05	7.01E-08	1.06E-06
223rd Street, Wilmington to Alameda	5.63E-03	1.90E-05	2.03E-07	2.81E-08	1.01E-07	1.01E-07	2.25E-07	1.94E-06	3.38E-09	1.41E-07	2.36E-07	2.25E-07	1.69E-07	1.07E-07	5.63E-08	9.79E-05	1.63E-07	2.46E-06
W Wardlow from Alameda to I-710	2.39E-02	8.05E-05	8.60E-07	1.19E-07	4.30E-07	4.30E-07	9.56E-07	8.22E-06	1.43E-08	5.97E-07	1.00E-06	9.56E-07	7.17E-07	4.54E-07	2.39E-07	4.16E-04	6.93E-07	1.05E-05

Table B-11
2030 Alternative 1
Maximum Hourly Truck Emissions

	SCAG Gasoline Truck Emissions					
	TOG	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
		71432	50000	106990	75070	107028
Alternative 1, 2030	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to Transition						
New Dock Ramps - Cerritos Channel (A1 Line)	1.75E-04	3.69E-06	2.38E-06	8.16E-07	4.29E-07	1.98E-07
SB Cerritos Channel - Transition (G1 Line)	4.75E-05	1.00E-06	6.45E-07	2.21E-07	1.16E-07	5.36E-08
NB Cerritos Channel - Transition (E1 Line)	5.48E-05	1.15E-06	7.45E-07	2.55E-07	1.34E-07	6.19E-08
Mainline Transition to HF Ramps & SR-103						
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	6.37E-05	1.34E-06	8.66E-07	2.97E-07	1.56E-07	7.20E-08
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	5.54E-05	1.17E-06	7.53E-07	2.58E-07	1.36E-07	6.26E-08
Henry Ford Ramps	9.79E-05	2.06E-06	1.33E-06	4.56E-07	2.40E-07	1.11E-07
Henry Ford n/o Ramps to Alameda	1.50E-03	3.17E-05	2.04E-05	7.00E-06	3.68E-06	1.70E-06
SR-47 Extension, HF Ramps to Alameda						
SB, 103 Split to Dominguex Channel (D1 Line)	8.81E-05	1.86E-06	1.20E-06	4.10E-07	2.16E-07	9.96E-08
NB, 103 Split to Dominguex Channel (F1 Line)	8.68E-05	1.83E-06	1.18E-06	4.05E-07	2.13E-07	9.81E-08
Dominguez Channel - Alameda (I1 Line)	2.09E-04	4.40E-06	2.84E-06	9.73E-07	5.12E-07	2.36E-07
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	4.98E-04	1.05E-05	6.78E-06	2.32E-06	1.22E-06	5.63E-07
SR-103 Anaheim to PCH	7.60E-04	1.60E-05	1.03E-05	3.54E-06	1.86E-06	8.59E-07
SR-103 PCH to Sepulveda/Willow	1.77E-03	3.73E-05	2.41E-05	8.25E-06	4.34E-06	2.00E-06
E and W Harry Bridges, Figueroa to start Alameda	1.59E-03	3.34E-05	2.16E-05	7.39E-06	3.88E-06	1.79E-06
Alameda beginning (E Harry Bridges) to Anaheim	1.49E-03	3.15E-05	2.03E-05	6.96E-06	3.66E-06	1.69E-06
Alameda Anaheim to Henry Ford	1.07E-03	2.25E-05	1.45E-05	4.97E-06	2.61E-06	1.20E-06
Alameda, Henry Ford to PCH	8.43E-04	1.78E-05	1.15E-05	3.93E-06	2.07E-06	9.53E-07
Alameda PCH to 405	1.81E-02	3.81E-04	2.45E-04	8.41E-05	4.42E-05	2.04E-05
Alameda 405 to del Amo	1.31E-02	2.76E-04	1.78E-04	6.11E-05	3.21E-05	1.48E-05
Alameda, del Amo to South Santa Fe Avenue	5.91E-03	1.25E-04	8.04E-05	2.75E-05	1.45E-05	6.68E-06
Alameda, South Santa Fe Avenue to SR-91	5.15E-03	1.09E-04	7.01E-05	2.40E-05	1.26E-05	5.82E-06
I-110, "C" Street Interchange to Anaheim	4.25E-03	8.97E-05	5.79E-05	1.98E-05	1.04E-05	4.81E-06
I-110, Anaheim to PCH	7.85E-03	1.66E-04	1.07E-04	3.66E-05	1.92E-05	8.87E-06
1-110, PCH to Sepulveda	1.78E-02	3.76E-04	2.42E-04	8.30E-05	4.36E-05	2.01E-05
I-110, Sepulveda to Carson	2.78E-02	5.87E-04	3.79E-04	1.30E-04	6.82E-05	3.15E-05
I-110, Carson to Del Amo	1.92E-02	4.05E-04	2.61E-04	8.94E-05	4.70E-05	2.17E-05
I-110, Del Amo to 405	1.76E-02	3.70E-04	2.39E-04	8.18E-05	4.30E-05	1.98E-05
I-110, 405 to SR-91	3.82E-02	8.06E-04	5.20E-04	1.78E-04	9.37E-05	4.32E-05
I-710, Anaheim to PCH	3.80E-03	8.00E-05	5.16E-05	1.77E-05	9.30E-06	4.29E-06
I-710, PCH to Willow	8.48E-03	1.79E-04	1.15E-04	3.95E-05	2.08E-05	9.58E-06
I-710, Willow to 405	1.38E-02	2.91E-04	1.88E-04	6.42E-05	3.38E-05	1.56E-05
I-710, 405 to Del Amo	2.29E-02	4.83E-04	3.12E-04	1.07E-04	5.62E-05	2.59E-05
I-710, Del Amo to Long Beach Blvd Interchange	2.01E-02	4.23E-04	2.73E-04	9.34E-05	4.91E-05	2.27E-05
I-710, Long Beach Boulevard to SR-91	2.54E-02	5.36E-04	3.46E-04	1.19E-04	6.23E-05	2.87E-05
PCH, I110 to Alameda	2.48E-02	5.23E-04	3.37E-04	1.16E-04	6.07E-05	2.80E-05
PCH, Alameda to SR-103	8.62E-03	1.82E-04	1.17E-04	4.02E-05	2.11E-05	9.74E-06
PCH, SR-103 to I-710	6.97E-03	1.47E-04	9.49E-05	3.25E-05	1.71E-05	7.88E-06
Sepulveda, I-110 to Avalon	7.27E-03	1.53E-04	9.89E-05	3.39E-05	1.78E-05	8.22E-06
Sepulveda, Avalon to Alameda	1.04E-02	2.19E-04	1.42E-04	4.85E-05	2.55E-05	1.18E-05
Sepulveda, Alameda to ICTF	1.50E-03	3.15E-05	2.03E-05	6.97E-06	3.66E-06	1.69E-06
Sepulveda, ICTF to SR-103	3.10E-04	6.54E-06	4.22E-06	1.44E-06	7.60E-07	3.50E-07
Del Amo, I-110 to Wilmington	1.47E-02	3.09E-04	2.00E-04	6.84E-05	3.60E-05	1.66E-05
Del Amo, Wilminton to Alameda	8.09E-03	1.70E-04	1.10E-04	3.77E-05	1.98E-05	9.14E-06
Del Amo, Alameda to I-710	1.00E-02	2.11E-04	1.36E-04	4.67E-05	2.46E-05	1.13E-05
223rd Street, I-110 to Avalon	8.43E-03	1.78E-04	1.15E-04	3.93E-05	2.07E-05	9.53E-06
223rd Street, Avalon to Wilmington	7.51E-03	1.58E-04	1.02E-04	3.50E-05	1.84E-05	8.48E-06
223rd Street, Wilmington to Alameda	8.29E-03	1.75E-04	1.13E-04	3.86E-05	2.03E-05	9.37E-06
W Wardlow from Alameda to I-710	1.39E-02	2.93E-04	1.89E-04	6.47E-05	3.40E-05	1.57E-05

Table B-11
2030 Alternative 1
Maximum Hourly Truck Emissions

	SCAG Diesel Truck Exhaust												
	TOG	1,3-Butadiene	Acetaldehyde	Benzene	Ethylbenzene	formaldehyde	n-Hexane	Methanol	MEK	Propylene	Sthrene	Toluene	Xylene
		106990	75070	71432	100414	50000	110543	67561	78933	115071	100425	108883	1330207
Alternative 1, 2030	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to Transition													
New Dock Ramps - Cerritos Channel (A1 Line)	1.16E-03	2.20E-06	8.52E-05	2.32E-05	3.53E-06	1.70E-04	1.82E-06	3.48E-07	1.71E-05	3.01E-05	6.72E-07	1.71E-05	1.21E-05
SB Cerritos Channel - Transition (G1 Line)	3.14E-04	5.96E-07	2.31E-05	6.28E-06	9.57E-07	4.62E-05	4.93E-07	9.41E-08	4.64E-06	8.15E-06	1.82E-07	4.62E-06	3.27E-06
NB Cerritos Channel - Transition (E1 Line)	3.62E-04	6.88E-07	2.66E-05	7.25E-06	1.10E-06	5.33E-05	5.69E-07	1.09E-07	5.35E-06	9.40E-06	2.10E-07	5.33E-06	3.77E-06
Mainline Transition to HF Ramps & SR-103													
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	4.21E-04	8.00E-07	3.10E-05	8.43E-06	1.28E-06	6.20E-05	6.61E-07	1.26E-07	6.22E-06	1.09E-05	2.44E-07	6.20E-06	4.38E-06
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	3.66E-04	6.96E-07	2.69E-05	7.33E-06	1.12E-06	5.39E-05	5.75E-07	1.10E-07	5.41E-06	9.51E-06	2.12E-07	5.40E-06	3.81E-06
Henry Ford Ramps	4.38E-04	8.32E-07	3.22E-05	8.76E-06	1.34E-06	6.44E-05	6.87E-07	1.31E-07	6.47E-06	1.14E-05	2.54E-07	6.45E-06	4.56E-06
Henry Ford n/o Ramps to Alameda	6.72E-03	1.28E-05	4.94E-04	1.35E-04	2.05E-05	9.89E-04	1.06E-05	2.02E-06	9.93E-05	1.75E-04	3.90E-06	9.90E-05	7.00E-05
SR-47 Extension, HF Ramps to Alameda													
SB, 103 Split to Dominguex Channel (D1 Line)	5.83E-04	1.11E-06	4.28E-05	1.17E-05	1.78E-06	8.57E-05	9.15E-07	1.75E-07	8.61E-06	1.51E-05	3.38E-07	8.58E-06	6.07E-06
NB, 103 Split to Dominguex Channel (F1 Line)	5.74E-04	1.09E-06	4.22E-05	1.15E-05	1.75E-06	8.45E-05	9.02E-07	1.72E-07	8.48E-06	1.49E-05	3.33E-07	8.46E-06	5.98E-06
Dominguez Channel - Alameda (I1 Line)	1.38E-03	2.63E-06	1.02E-04	2.77E-05	4.21E-06	2.03E-04	2.17E-06	4.15E-07	2.04E-05	3.59E-05	8.01E-07	2.04E-05	1.44E-05
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	3.30E-03	6.26E-06	2.42E-04	6.60E-05	1.01E-05	4.85E-04	5.18E-06	9.89E-07	4.87E-05	8.56E-05	1.91E-06	4.86E-05	3.43E-05
SR-103 Anaheim to PCH	5.03E-03	9.56E-06	3.70E-04	1.01E-04	1.53E-05	7.40E-04	7.90E-06	1.51E-06	7.43E-05	1.31E-04	2.92E-06	7.41E-05	5.24E-05
SR-103 PCH to Sepulveda/Willow	1.17E-02	2.23E-05	8.62E-04	2.34E-04	3.57E-05	1.72E-03	1.84E-05	3.52E-06	1.73E-04	3.04E-04	6.80E-06	1.73E-04	1.22E-04
E and W Harry Bridges, Figueroa to start Alameda	1.00E-02	1.90E-05	7.36E-04	2.00E-04	3.05E-05	1.47E-03	1.57E-05	3.00E-06	1.48E-04	2.60E-04	5.81E-06	1.47E-04	1.04E-04
Alameda beginning (E Harry Bridges) to Anaheim	9.43E-03	1.79E-05	6.94E-04	1.89E-04	2.88E-05	1.39E-03	1.48E-05	2.83E-06	1.39E-04	2.45E-04	5.47E-06	1.39E-04	9.82E-05
Alameda Anaheim to Henry Ford	6.73E-03	1.28E-05	4.95E-04	1.35E-04	2.05E-05	9.90E-04	1.06E-05	2.02E-06	9.94E-05	1.75E-04	3.90E-06	9.91E-05	7.01E-05
Alameda, Henry Ford to PCH	5.32E-03	1.01E-05	3.91E-04	1.06E-04	1.62E-05	7.83E-04	8.36E-06	1.60E-06	7.86E-05	1.38E-04	3.09E-06	7.84E-05	5.54E-05
Alameda PCH to 405	1.05E-01	1.99E-04	7.69E-03	2.09E-03	3.19E-04	1.54E-02	1.64E-04	3.14E-05	1.54E-03	2.72E-03	6.06E-05	1.54E-03	1.09E-03
Alameda 405 to del Amo	8.28E-02	1.57E-04	6.09E-03	1.66E-03	2.52E-04	1.22E-02	1.30E-04	2.48E-05	1.22E-03	2.15E-03	4.80E-05	1.22E-03	8.62E-04
Alameda, del Amo to South Santa Fe Avenue	3.73E-02	7.09E-05	2.74E-03	7.47E-04	1.14E-04	5.49E-03	5.86E-05	1.12E-05	5.51E-04	9.69E-04	2.16E-05	5.50E-04	3.88E-04
Alameda, South Santa Fe Avenue to SR-91	3.25E-02	6.18E-05	2.39E-03	6.51E-04	9.92E-05	4.79E-03	5.11E-05	9.76E-06	4.80E-04	8.45E-04	1.89E-05	4.79E-04	3.39E-04
I-110, "C" Street Interchange to Anaheim	2.83E-02	5.37E-05	2.08E-03	5.65E-04	8.62E-05	4.16E-03	4.44E-05	8.48E-06	4.17E-04	7.34E-04	1.64E-05	4.16E-04	2.94E-04
I-110, Anaheim to PCH	5.21E-02	9.91E-05	3.83E-03	1.04E-03	1.59E-04	7.67E-03	8.19E-05	1.56E-05	7.70E-04	1.35E-03	3.02E-05	7.68E-04	5.43E-04
1-110, PCH to Sepulveda	1.18E-01	2.25E-04	8.70E-03	2.37E-03	3.61E-04	1.74E-02	1.86E-04	3.55E-05	1.75E-03	3.07E-03	6.86E-05	1.74E-03	1.23E-03
I-110, Sepulveda to Carson	1.85E-01	3.51E-04	1.36E-02	3.70E-03	5.64E-04	2.72E-02	2.90E-04	5.55E-05	2.73E-03	4.80E-03	1.07E-04	2.72E-03	1.92E-03
I-110, Carson to Del Amo	1.27E-01	2.42E-04	9.37E-03	2.55E-03	3.89E-04	1.88E-02	2.00E-04	3.82E-05	1.88E-03	3.31E-03	7.39E-05	1.88E-03	1.33E-03
I-110, Del Amo to 405	1.17E-01	2.22E-04	8.58E-03	2.33E-03	3.56E-04	1.72E-02	1.83E-04	3.50E-05	1.72E-03	3.03E-03	6.76E-05	1.72E-03	1.21E-03
I-110, 405 to SR-91	2.54E-01	4.83E-04	1.87E-02	5.08E-03	7.75E-04	3.74E-02	3.99E-04	7.62E-05	3.75E-03	6.60E-03	1.47E-04	3.74E-03	2.64E-03
I-710, Anaheim to PCH	2.50E-02	4.75E-05	1.84E-03	5.01E-04	7.63E-05	3.68E-03	3.93E-05	7.50E-06	3.69E-04	6.50E-04	1.45E-05	3.68E-04	2.60E-04
I-710, PCH to Willow	5.59E-02	1.06E-04	4.11E-03	1.12E-03	1.70E-04	8.22E-03	8.77E-05	1.68E-05	8.25E-04	1.45E-03	3.24E-05	8.23E-04	5.82E-04
I-710, Willow to 405	9.09E-02	1.73E-04	6.68E-03	1.82E-03	2.77E-04	1.34E-02	1.43E-04	2.73E-05	1.34E-03	2.36E-03	5.27E-05	1.34E-03	9.46E-04
I-710, 405 to Del Amo	1.51E-01	2.87E-04	1.11E-02	3.02E-03	4.61E-04	2.22E-02	2.37E-04	4.53E-05	2.23E-03	3.93E-03	8.77E-05	2.23E-03	1.57E-03
I-710, Del Amo to Long Beach Blvd Interchange	1.32E-01	2.51E-04	9.72E-03	2.65E-03	4.03E-04	1.95E-02	2.08E-04	3.97E-05	1.95E-03	3.43E-03	7.67E-05	1.95E-03	1.38E-03
I-710, Long Beach Boulevard to SR-91	1.68E-01	3.19E-04	1.23E-02	3.36E-03	5.11E-04	2.47E-02	2.63E-04	5.03E-05	2.48E-03	4.35E-03	9.73E-05	2.47E-03	1.75E-03
PCH, I110 to Alameda	1.11E-01	2.11E-04	8.15E-03	2.22E-03	3.38E-04	1.63E-02	1.74E-04	3.33E-05	1.64E-03	2.88E-03	6.43E-05	1.63E-03	1.15E-03
PCH, Alameda to SR-103	3.86E-02	7.33E-05	2.84E-03	7.72E-04	1.18E-04	5.67E-03	6.05E-05	1.16E-05	5.70E-04	1.00E-03	2.24E-05	5.68E-04	4.01E-04
PCH, SR-103 to I-710	3.12E-02	5.93E-05	2.29E-03	6.24E-04	9.51E-05	4.59E-03	4.90E-05	9.36E-06	4.61E-04	8.10E-04	1.81E-05	4.60E-04	3.25E-04
Sepulveda, I-110 to Avalon	3.80E-02	7.23E-05	2.80E-03	7.61E-04	1.16E-04	5.60E-03	5.97E-05	1.14E-05	5.62E-04	9.88E-04	2.21E-05	5.60E-04	3.96E-04
Sepulveda, Avalon to Alameda	5.45E-02	1.04E-04	4.01E-03	1.09E-03	1.66E-04	8.02E-03	8.55E-05	1.63E-05	8.05E-04	1.41E-03	3.16E-05	8.02E-04	5.67E-04
Sepulveda, Alameda to ICTF	7.83E-03	1.49E-05	5.76E-04	1.57E-04	2.39E-05	1.15E-03	1.23E-05	2.35E-06	1.16E-04	2.03E-04	4.54E-06	1.15E-04	8.15E-05
Sepulveda, ICTF to SR-103	1.62E-03	3.08E-06	1.19E-04	3.25E-05	4.95E-06	2.39E-04	2.55E-06	4.87E-07	2.40E-05	4.21E-05	9.41E-07	2.39E-05	1.69E-05
Del Amo, I-110 to Wilmington	7.68E-02	1.46E-04	5.65E-03	1.54E-03	2.34E-04	1.13E-02	1.21E-04	2.30E-05	1.13E-03	1.99E-03	4.46E-05	1.13E-03	8.00E-04
Del Amo, Wilminton to Alameda	4.23E-02	8.04E-05	3.11E-03	8.47E-04	1.29E-04	6.23E-03	6.64E-05	1.27E-05	6.25E-04	1.10E-03	2.45E-05	6.23E-04	4.41E-04
Del Amo, Alameda to I-710	5.25E-02	9.97E-05	3.86E-03	1.05E-03	1.60E-04	7.72E-03	8.24E-05	1.57E-05	7.75E-04	1.36E-03	3.04E-05	7.73E-04	5.46E-04
223rd Street, I-110 to Avalon	4.41E-02	8.38E-05	3.24E-03	8.83E-04	1.35E-04	6.49E-03	6.93E-05	1.32E-05	6.52E-04	1.15E-03	2.56E-05	6.50E-04	4.59E-04
223rd Street, Avalon to Wilmington	3.93E-02	7.47E-05	2.89E-03	7.86E-04	1.20E-04	5.78E-03	6.17E-05	1.18E-05	5.80E-04	1.02E-03	2.28E-05	5.79E-04	4.09E-04
223rd Street, Wilmington to Alameda	4.34E-02	8.24E-05	3.19E-03	8.68E-04	1.32E-04	6.38E-03	6.81E-05	1.30E-05	6.41E-04	1.13E-03	2.52E-05	6.39E-04	4.52E-04
W Wardlow from Alameda to I-710	7.26E-02	1.38E-04	5.34E-03	1.45E-03	2.22E-04	1.07E-02	1.14E-04	2.18E-05	1.07E-03	1.89E-03	4.21E-05	1.07E-03	7.56E-04

Table B-11
2030 Alternative 1
Maximum Hourly Truck Emissions

	SCAG Diesel Truck Exhaust Emissions																	
	DPM	Ammonia	Antimony	Arsenic	Bromine	Bromine	Cadmium	Chlorine	Chromium (hex)	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Sulfates	Vanadium	Zinc
		7664417	7440360	7440382	7726956	7726956	7440439	7782505	18540299	7440508	7439921	7439965	7439976	7440020	7782492	9960	7440622	7440666
Alternative 1, 2030	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to Transition																		
New Dock Ramps - Cerritos Channel (A1 Line)	4.02E-04	1.36E-06	1.45E-08	2.01E-09	7.24E-09	7.24E-09	1.61E-08	1.38E-07	2.41E-10	1.01E-08	1.69E-08	1.61E-08	1.21E-08	7.64E-09	4.02E-09	7.00E-06	1.17E-08	1.76E-07
SB Cerritos Channel - Transition (G1 Line)	1.09E-04	3.67E-07	3.92E-09	5.45E-10	1.96E-09	1.96E-09	4.36E-09	3.75E-08	6.54E-11	2.72E-09	4.58E-09	4.36E-09	3.27E-09	2.07E-09	1.09E-09	1.90E-06	3.16E-09	4.77E-08
NB Cerritos Channel - Transition (E1 Line)	1.26E-04	4.23E-07	4.53E-09	6.29E-10	2.26E-09	2.26E-09	5.03E-09	4.32E-08	7.54E-11	3.14E-09	5.28E-09	5.03E-09	3.77E-09	2.39E-09	1.26E-09	2.19E-06	3.65E-09	5.51E-08
Mainline Transition to HF Ramps & SR-103	0.00E+00																	
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	1.46E-04	4.93E-07	5.26E-09	7.31E-10	2.63E-09	2.63E-09	5.85E-09	5.03E-08	8.77E-11	3.66E-09	6.14E-09	5.85E-09	4.39E-09	2.78E-09	1.46E-09	2.54E-06	4.24E-09	6.40E-08
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	1.27E-04	4.28E-07	4.58E-09	6.36E-10	2.29E-09	2.29E-09	5.09E-09	4.37E-08	7.63E-11	3.18E-09	5.34E-09	5.09E-09	3.81E-09	2.42E-09	1.27E-09	2.21E-06	3.69E-09	5.57E-08
Henry Ford Ramps	7.73E-05	2.60E-07	2.78E-09	3.86E-10	1.39E-09	1.39E-09	3.09E-09	2.66E-08	4.64E-11	1.93E-09	3.25E-09	3.09E-09	2.32E-09	1.47E-09	7.73E-10	1.34E-06	2.24E-09	3.39E-08
Henry Ford n/o Ramps to Alameda	1.19E-03	4.00E-06	4.27E-08	5.93E-09	2.14E-08	2.14E-08	4.75E-08	4.08E-07	7.12E-10	2.97E-08	4.98E-08	4.75E-08	3.56E-08	2.25E-08	1.19E-08	2.07E-05	3.44E-08	5.20E-07
SR-47 Extension, HF Ramps to Alameda	0.00E+00																	
SB, 103 Split to Dominguex Channel (D1 Line)	2.02E-04	6.81E-07	7.28E-09	1.01E-09	3.64E-09	3.64E-09	8.09E-09	6.96E-08	1.21E-10	5.06E-09	8.50E-09	8.09E-09	6.07E-09	3.84E-09	2.02E-09	3.52E-06	5.87E-09	8.86E-08
NB, 103 Split to Dominguex Channel (F1 Line)	1.99E-04	6.72E-07	7.18E-09	9.97E-10	3.59E-09	3.59E-09	7.98E-09	6.86E-08	1.20E-10	4.98E-09	8.37E-09	7.98E-09	5.98E-09	3.79E-09	1.99E-09	3.47E-06	5.78E-09	8.73E-08
Dominguez Channel - Alameda (I1 Line)	4.80E-04	1.62E-06	1.73E-08	2.40E-09	8.63E-09	8.63E-09	1.92E-08	1.65E-07	2.88E-10	1.20E-08	2.01E-08	1.92E-08	1.44E-08	9.11E-09	4.80E-09	8.35E-06	1.39E-08	2.10E-07
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.14E-03	3.86E-06	4.12E-08	5.72E-09	2.06E-08	2.06E-08	4.58E-08	3.94E-07	6.87E-10	2.86E-08	4.81E-08	4.58E-08	3.43E-08	2.17E-08	1.14E-08	1.99E-05	3.32E-08	5.01E-07
SR-103 Anaheim to PCH	1.75E-03	5.88E-06	6.29E-08	8.73E-09	3.14E-08	3.14E-08	6.98E-08	6.01E-07	1.05E-09	4.36E-08	7.33E-08	6.98E-08	5.24E-08	3.32E-08	1.75E-08	3.04E-05	5.06E-08	7.65E-07
SR-103 PCH to Sepulveda/Willow	4.07E-03	1.37E-05	1.46E-07	2.03E-08	7.32E-08	7.32E-08	1.63E-07	1.40E-06	2.44E-09	1.02E-07	1.71E-07	1.63E-07	1.22E-07	7.73E-08	4.07E-08	7.08E-05	1.18E-07	1.78E-06
E and W Harry Bridges, Figueroa to start Alameda	2.21E-03	7.43E-06	7.94E-08	1.10E-08	3.97E-08	3.97E-08	8.82E-08	7.59E-07	1.32E-09	5.51E-08	9.26E-08	8.82E-08	6.62E-08	4.19E-08	2.21E-08	3.84E-05	6.40E-08	9.66E-07
Alameda beginning (E Harry Bridges) to Anaheim	2.08E-03	7.00E-06	7.48E-08	1.04E-08	3.74E-08	3.74E-08	8.31E-08	7.15E-07	1.25E-09	5.19E-08	8.73E-08	8.31E-08	6.23E-08	3.95E-08	2.08E-08	3.62E-05	6.03E-08	9.10E-07
Alameda Anaheim to Henry Ford	1.48E-03	4.99E-06	5.34E-08	7.41E-09	2.67E-08	2.67E-08	5.93E-08	5.10E-07	8.90E-10	3.71E-08	6.23E-08	5.93E-08	4.45E-08	2.82E-08	1.48E-08	2.58E-05	4.30E-08	6.49E-07
Alameda, Henry Ford to PCH	1.17E-03	3.95E-06	4.22E-08	5.86E-09	2.11E-08	2.11E-08	4.69E-08	4.03E-07	7.04E-10	2.93E-08	4.92E-08	4.69E-08	3.52E-08	2.23E-08	1.17E-08	2.04E-05	3.40E-08	5.14E-07
Alameda PCH to 405	2.08E-02	7.00E-05	7.48E-07	1.04E-07	3.74E-07	3.74E-07	8.32E-07	7.15E-06	1.25E-08	5.20E-07	8.73E-07	8.32E-07	6.24E-07	3.95E-07	2.08E-07	3.62E-04	6.03E-07	9.11E-06
Alameda 405 to del Amo	1.82E-02	6.14E-05	6.56E-07	9.12E-08	3.28E-07	3.28E-07	7.29E-07	6.27E-06	1.09E-08	4.56E-07	7.66E-07	7.29E-07	5.47E-07	3.46E-07	1.82E-07	3.17E-04	5.29E-07	7.99E-06
Alameda, del Amo to South Santa Fe Avenue	8.22E-03	2.77E-05	2.96E-07	4.11E-08	1.48E-07	1.48E-07	3.29E-07	2.83E-06	4.93E-09	2.06E-07	3.45E-07	3.29E-07	2.47E-07	1.56E-07	8.22E-08	1.43E-04	2.38E-07	3.60E-06
Alameda, South Santa Fe Avenue to SR-91	7.17E-03	2.41E-05	2.58E-07	3.58E-08	1.29E-07	1.29E-07	2.87E-07	2.46E-06	4.30E-09	1.79E-07	3.01E-07	2.87E-07	2.15E-07	1.36E-07	7.17E-08	1.25E-04	2.08E-07	3.14E-06
I-110, "C" Street Interchange to Anaheim	8.31E-03	2.80E-05	2.99E-07	4.16E-08	1.50E-07	1.50E-07	3.33E-07	2.86E-06	4.99E-09	2.08E-07	3.49E-07	3.33E-07	2.49E-07	1.58E-07	8.31E-08	1.45E-04	2.41E-07	3.64E-06
I-110, Anaheim to PCH	1.53E-02	5.17E-05	5.52E-07	7.67E-08	2.76E-07	2.76E-07	6.14E-07	5.28E-06	9.20E-09	3.83E-07	6.44E-07	6.14E-07	4.60E-07	2.91E-07	1.53E-07	2.67E-04	4.45E-07	6.72E-06
1-110, PCH to Sepulveda	3.48E-02	1.17E-04	1.25E-06	1.74E-07	6.27E-07	6.27E-07	1.39E-06	1.20E-05	2.09E-08	8.70E-07	1.46E-06	1.39E-06	1.04E-06	6.61E-07	3.48E-07	6.06E-04	1.01E-06	1.52E-05
I-110, Sepulveda to Carson	5.44E-02	1.83E-04	1.96E-06	2.72E-07	9.79E-07	9.79E-07	2.18E-06	1.87E-05	3.26E-08	1.36E-06	2.28E-06	2.18E-06	1.63E-06	1.03E-06	5.44E-07	9.46E-04	1.58E-06	2.38E-05
I-110, Carson to Del Amo	3.75E-02	1.26E-04	1.35E-06	1.87E-07	6.75E-07	6.75E-07	1.50E-06	1.29E-05	2.25E-08	9.37E-07	1.57E-06	1.50E-06	1.12E-06	7.12E-07	3.75E-07	6.52E-04	1.09E-06	1.64E-05
I-110, Del Amo to 405	3.43E-02	1.16E-04	1.24E-06	1.72E-07	6.18E-07	6.18E-07	1.37E-06	1.18E-05	2.06E-08	8.58E-07	1.44E-06	1.37E-06	1.03E-06	6.52E-07	3.43E-07	5.97E-04	9.95E-07	1.50E-05
I-110, 405 to SR-91	7.47E-02	2.52E-04	2.69E-06	3.74E-07	1.34E-06	1.34E-06	2.99E-06	2.57E-05	4.48E-08	1.87E-06	3.14E-06	2.99E-06	2.24E-06	1.42E-06	7.47E-07	1.30E-03	2.17E-06	3.27E-05
I-710, Anaheim to PCH	6.33E-03	2.13E-05	2.28E-07	3.17E-08	1.14E-07	1.14E-07	2.53E-07	2.18E-06	3.80E-09	1.58E-07	2.66E-07	2.53E-07	1.90E-07	1.20E-07	6.33E-08	1.10E-04	1.84E-07	2.77E-06
I-710, PCH to Willow	1.41E-02	4.77E-05	5.09E-07	7.07E-08	2.55E-07	2.55E-07	5.66E-07	4.87E-06	8.49E-09	3.54E-07	5.94E-07	5.66E-07	4.24E-07	2.69E-07	1.41E-07	2.46E-04	4.10E-07	6.20E-06
I-710, Willow to 405	2.30E-02	7.75E-05	8.28E-07	1.15E-07	4.14E-07	4.14E-07	9.20E-07	7.91E-06	1.38E-08	5.75E-07	9.66E-07	9.20E-07	6.90E-07	4.37E-07	2.30E-07	4.00E-04	6.67E-07	1.01E-05
I-710, 405 to Del Amo	3.83E-02	1.29E-04	1.38E-06	1.91E-07	6.89E-07	6.89E-07	1.53E-06	1.32E-05	2.30E-08	9.57E-07	1.61E-06	1.53E-06	1.15E-06	7.27E-07	3.83E-07	6.66E-04	1.11E-06	1.68E-05
I-710, Del Amo to Long Beach Blvd Interchange	3.35E-02	1.13E-04	1.20E-06	1.67E-07	6.02E-07	6.02E-07	1.34E-06	1.15E-05	2.01E-08	8.37E-07	1.41E-06	1.34E-06	1.00E-06	6.36E-07	3.35E-07	5.82E-04	9.71E-07	1.47E-05
I-710, Long Beach Boulevard to SR-91	4.25E-02	1.43E-04	1.53E-06	2.12E-07	7.64E-07	7.64E-07	1.70E-06	1.46E-05	2.55E-08	1.06E-06	1.78E-06	1.70E-06	1.27E-06	8.07E-07	4.25E-07	7.39E-04	1.23E-06	1.86E-05
PCH, I110 to Alameda	1.96E-02	6.59E-05	7.05E-07	9.79E-08	3.52E-07	3.52E-07	7.83E-07	6.73E-06	1.17E-08	4.89E-07	8.22E-07	7.83E-07	5.87E-07	3.72E-07	1.96E-07	3.41E-04	5.68E-07	8.57E-06
PCH, Alameda to SR-103	6.81E-03	2.29E-05	2.45E-07	3.40E-08	1.23E-07	1.23E-07	2.72E-07	2.34E-06	4.08E-09	1.70E-07	2.86E-07	2.72E-07	2.04E-07	1.29E-07	6.81E-08	1.18E-04	1.97E-07	2.98E-06
PCH, SR-103 to I-710	5.51E-03	1.86E-05	1.98E-07	2.75E-08	9.91E-08	9.91E-08	2.20E-07	1.89E-06	3.30E-09	1.38E-07	2.31E-07	2.20E-07	1.65E-07	1.05E-07	5.51E-08	9.58E-05	1.60E-07	2.41E-06
Sepulveda, I-110 to Avalon	6.99E-03	2.35E-05	2.51E-07	3.49E-08	1.26E-07	1.26E-07	2.79E-07	2.40E-06	4.19E-09	1.75E-07	2.93E-07	2.79E-07	2.10E-07	1.33E-07	6.99E-08	1.22E-04	2.03E-07	3.06E-06
Sepulveda, Avalon to Alameda	1.00E-02	3.37E-05	3.60E-07	5.00E-08	1.80E-07	1.80E-07	4.00E-07	3.44E-06	6.00E-09	2.50E-07	4.20E-07	4.00E-07	3.00E-07	1.90E-07	1.00E-07	1.74E-04	2.90E-07	4.38E-06
Sepulveda, Alameda to ICTF	1.44E-03	4.84E-06	5.17E-08	7.19E-09	2.59E-08	2.59E-08	5.75E-08	4.94E-07	8.62E-10	3.59E-08	6.04E-08	5.75E-08	4.31E-08	2.73E-08	1.44E-08	2.50E-05	4.17E-08	6.29E-07
Sepulveda, ICTF to SR-103	2.98E-04	1.00E-06	1.07E-08	1.49E-09	5.36E-09	5.36E-09	1.19E-08	1.02E-07	1.79E-10	7.45E-09	1.25E-08	1.19E-08	8.94E-09	5.66E-09	2.98E-09	5.18E-06	8.64E-09	1.30E-07
Del Amo, I-110 to Wilmington	1.41E-02	4.75E-05	5.08E-07	7.05E-08	2.54E-07	2.54E-07	5.64E-07	4.85E-06	8.46E-09	3.53E-07	5.92E-07	5.64E-07	4.23E-07	2.68E-07	1.41E-07	2.45E-04	4.09E-07	6.18E-06
Del Amo, Wilminton to Alameda	7.77E-03	2.62E-05	2.80E-07	3.88E-08	1.40E-07	1.40E-07	3.11E-07	2.67E-06	4.66E-09	1.94E-07	3.26E-07	3.11E-07	2.33E-07	1.48E-07	7.77E-08	1.35E-04	2.25E-07	3.40E-06
Del Amo, Alameda to I-710	9.63E-03	3.25E-05	3.47E-07	4.82E-08	1.73E-07	1.73E-07	3.85E-07	3.31E-06	5.78E-09	2.41E-07	4.05E-07	3.85E-07	2.89E-07	1.83E-07	9.63E-08	1.68E-04	2.79E-07	4.22E-06
223rd Street, I-110 to Avalon	8.10E-03	2.73E-05	2.92E-07	4.05E-08	1.46E-07	1.46E-07	3.24E-07	2.79E-06	4.86E-09	2.03E-07	3.40E-07	3.24E-07	2.43E-07	1.54E-07	8.10E-08	1.41E-04	2.35E-07	3.55E-06
223rd Street, Avalon to Wilmington	7.22E-03	2.43E-05	2.60E-07	3.61E-08	1.30E-07	1.30E-07	2.89E-07	2.48E-06	4.33E-09	1.80E-07	3.03E-07	2.89E-07	2.16E-07	1.37E-07	7.22E-08	1.26E-04	2.09E-07	3.16E-06
223rd Street, Wilmington to Alameda	7.96E-03	2.68E-05	2.87E-07	3.98E-08	1.43E-07	1.43E-07	3.19E-07	2.74E-06	4.78E-09	1.99E-07	3.34E-07	3.19E-07	2.39E-07	1.51E-07	7.96E-08	1.39E-04	2.31E-07	3.49E-06
W Wardlow from Alameda to I-710	1.33E-02	4.49E-05	4.80E-07	6.67E-08	2.40E-07	2.40E-07	5.34E-07	4.59E-06	8.00E-09	3.33E-07	5.60E-07	5.34E-07	4.00E-07	2.53E-07	1.33E-07	2.32E-04	3.87E-07	5.84E-06

Table B-12
2030 Alternative 2
Maximum Hourly Truck Emissions

	Length	Cong Speed	Port Peak Hour trucks	SCAG Peak Hour trucks	Port Peak hr LNG trucks	Port Peak hr Dsl/Alt trucks	SCAG Peak hr Gas trucks	SCAG Peak hr Dsl trucks
2030 Alternative 2	mile	mph	veh/hr	veh/hr	veh/hr	veh/hr	veh/hr	veh/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	0.65	50	3424	8	912.4	2511.6	4.152	3.848
Henry Ford Ramps	0.24	15	479	0	114.8	364.2	0	0
Henry Ford n/o Ramps to Alameda	0.68	15	807	25	154.4	652.6	12.975	12.025
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.04	45	2945	7	797.2	2147.8	3.633	3.367
SR-103 Anaheim to PCH	0.57	45	3212	39	892.8	2319.2	20.241	18.759
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	0.47	45	2649	67	751.2	1897.8	34.773	32.227
SR-103 Ramps south of Sepulveda/Willow		55	674	39	133.2	540.8		
NB Sepulveda Ramp (G2 Line)	0.36	55	404.4	23.4	79.92	324.48	12.1446	11.2554
SB Sepulveda Ramp (F2 Ramp)	0.38	55	269.6	15.6	53.28	216.32	8.0964	7.5036
SR-103 Existing, End Ramps to Sepulveda/Willow		55			0			
SB Sepulveda Ramp Traffic	0.07	55	269.6	15.6	53.28	216.32	8.0964	7.5036
SB+NB Sepulveda Ramp Traffic	0.11	55	674	39	133.2	540.8	20.241	18.759
SR-103, Realignment to End (223rd/Wardlow)	1.85	45	1976	28	617.6	1358.4	14.532	13.468
E and W Harry Bridges, Figueroa to start Alameda	1.44	30	557	29	197.2	359.8	15.051	13.949
Alameda beginning (E Harry Bridges) to Anaheim	0.77	30	614	55	221.6	392.4	28.545	26.455
Alameda Anaheim to Henry Ford	0.42	30	404	64	152.4	251.6	33.216	30.784
Alameda, Henry Ford to PCH	0.34	30	966	64	275.6	690.4	33.216	30.784
Alameda PCH to 405	2.27	40	863	213	239.2	623.8	110.547	102.453
Alameda 405 to del Amo	1.72	35	1798	207	474.4	1323.6	107.433	99.567
Alameda, del Amo to South Santa Fe Avenue	0.84	35	1503	186	601.2	901.8	96.534	89.466
Alameda, South Santa Fe Avenue to SR-91	1.15	35	999	127	290	709	65.913	61.087
I-110, "C" Street Interchange to Anaheim	0.49	45	1712	326	334.4	1377.6	169.194	156.806
I-110, Anaheim to PCH	0.80	45	1731	359	546	1185	186.321	172.679
1-110, PCH to Sepulveda	1.39	45	1736	463	550.8	1185.2	240.297	222.703
I-110, Sepulveda to Carson	1.56	45	1632	648	518.4	1113.6	336.312	311.688
I-110, Carson to Del Amo	1.02	45	1560	690	496	1064	358.11	331.89
I-110, Del Amo to 405	0.74	45	1509	860	480.8	1028.2	446.34	413.66
I-110, 405 to SR-91	1.09	45	1360	1266	423.6	936.4	657.054	608.946
I-710, Anaheim to PCH	0.50	40	4132	249	1123.2	3008.8	129.231	119.769
I-710, PCH to Willow	1.01	40	4199	276	1191.2	3007.8	143.244	132.756
I-710, Willow to 405	1.52	40	4180	291	1186	2994	151.029	139.971
I-710, 405 to Del Amo	1.42	40	3974	524	1157.2	2816.8	271.956	252.044
I-710, Del Amo to Long Beach Blvd Interchange	1.17	40	3893	557	1133.6	2759.4	289.083	267.917
I-710, Long Beach Boulevard to SR-91	0.96	40	3869	899	1129.2	2739.8	466.581	432.419
PCH, I-110 to Alameda	2.38	20	240	161	72.8	167.2	83.559	77.441
PCH, Alameda to SR-103	0.94	20	89	92	16.8	72.2	47.748	44.252
PCH, SR-103 to I-710	0.98	20	731	95	212	519	49.305	45.695
Sepulveda, I-110 to Avalon	1.37	25	55	88	13.6	41.4	45.672	42.328
Sepulveda, Avalon to Alameda	1.70	25	104	106	13.2	90.8	55.014	50.986
Sepulveda, Alameda to ICTF	0.67	25	165	48	41.2	123.8	24.912	23.088
Sepulveda, ICTF to SR-103	0.17	25	674	41	133.2	540.8	21.279	19.721
Del Amo, I-110 to Wilmington	2.96	25	51	118	8	43	61.242	56.758
Del Amo, Wilminton to Alameda	0.77	25	103	187	41.6	61.4	97.053	89.947
Del Amo, Alameda to I-710	0.87	25	116	197	27.6	88.4	102.243	94.757
223rd Street, I-110 to Avalon	1.36	25	17	94	4.8	12.2	48.786	45.214
223rd Street, Avalon to Wilmington	1.23	25	32	93	7.6	24.4	48.267	44.733
223rd Street, Wilmington to Alameda	0.79	25	203	164	75.2	127.8	85.116	78.884
W Wardlow from Alameda to I-710	1.30	25	276	179	29.2	246.8	92.901	86.099

Table B-12
2030 Alternative 2
Maximum Hourly Truck Emissions

	Port - LNG Trucks				Port - Diesel Trucks		SCAG Gasoline Trucks	SCAG - Diesel Trucks	
	LNG Exhst TOG	LNG Exhst Dsl TOG	LNG Exhst PM	LNG Exhst DPM	Dsl Exhst Dsl TOG	Dsl Exhst PM	TOG	Dsl Exhst Dsl TOG	Dsl Exhst PM
2030 Alternative 2	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi	g/veh-mi
SR-47 Mainline, New Dock Ramps to HF Ramps	0.4890	0.0257	0.1114	0.0059	0.202	0.066	0.022	0.157	0.055
Henry Ford Ramps	0.4890	0.0257	0.1114	0.0059	0.733	0.050	0.097	0.536	0.068
Henry Ford n/o Ramps to Alameda	0.4890	0.0257	0.1114	0.0059	0.733	0.050	0.097	0.536	0.068
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	0.4890	0.0257	0.1114	0.0059	0.223	0.058	0.024	0.172	0.051
SR-103 Anaheim to PCH	0.4890	0.0257	0.1114	0.0059	0.223	0.058	0.024	0.172	0.051
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	0.4890	0.0257	0.1114	0.0059	0.223	0.058	0.024	0.172	0.051
SR-103 Ramps south of Sepulveda/Willow									
NB Sepulveda Ramp (G2 Line)	0.4890	0.0257	0.1114	0.0059	0.187	0.076	0.021	0.147	0.060
SB Sepulveda Ramp (F2 Ramp)	0.4890	0.0257	0.1114	0.0059	0.187	0.076	0.021	0.147	0.060
SR-103 Existing, End Ramps to Sepulveda/Willow									
SB Sepulveda Ramp Traffic	0.4890	0.0257	0.1114	0.0059	0.187	0.076	0.021	0.147	0.060
SB+NB Sepulveda Ramp Traffic	0.4890	0.0257	0.1114	0.0059	0.187	0.076	0.021	0.147	0.060
SR-103, Realignment to End (223rd/Wardlow)	0.4890	0.0257	0.1114	0.0059	0.223	0.058	0.024	0.172	0.051
E and W Harry Bridges, Figueroa to start Alameda	0.4890	0.0257	0.1114	0.0059	0.328	0.046	0.040	0.250	0.050
Alameda beginning (E Harry Bridges) to Anaheim	0.4890	0.0257	0.1114	0.0059	0.328	0.046	0.040	0.250	0.050
Alameda Anaheim to Henry Ford	0.4890	0.0257	0.1114	0.0059	0.328	0.046	0.040	0.250	0.050
Alameda, Henry Ford to PCH	0.4890	0.0257	0.1114	0.0059	0.328	0.046	0.040	0.250	0.050
Alameda PCH to 405	0.4890	0.0257	0.1114	0.0059	0.252	0.052	0.027	0.192	0.049
Alameda 405 to del Amo	0.4890	0.0257	0.1114	0.0059	0.286	0.047	0.032	0.218	0.048
Alameda, del Amo to South Santa Fe Avenue	0.4890	0.0257	0.1114	0.0059	0.286	0.047	0.032	0.218	0.048
Alameda, South Santa Fe Avenue to SR-91	0.4890	0.0257	0.1114	0.0059	0.286	0.047	0.032	0.218	0.048
I-110, "C" Street Interchange to Anaheim	0.4890	0.0257	0.1114	0.0059	0.223	0.058	0.024	0.172	0.051
I-110, Anaheim to PCH	0.4890	0.0257	0.1114	0.0059	0.223	0.058	0.024	0.172	0.051
1-110, PCH to Sepulveda	0.4890	0.0257	0.1114	0.0059	0.223	0.058	0.024	0.172	0.051
I-110, Sepulveda to Carson	0.4890	0.0257	0.1114	0.0059	0.223	0.058	0.024	0.172	0.051
I-110, Carson to Del Amo	0.4890	0.0257	0.1114	0.0059	0.223	0.058	0.024	0.172	0.051
I-110, Del Amo to 405	0.4890	0.0257	0.1114	0.0059	0.223	0.058	0.024	0.172	0.051
I-110, 405 to SR-91	0.4890	0.0257	0.1114	0.0059	0.223	0.058	0.024	0.172	0.051
I-710, Anaheim to PCH	0.4890	0.0257	0.1114	0.0059	0.252	0.052	0.027	0.192	0.049
I-710, PCH to Willow	0.4890	0.0257	0.1114	0.0059	0.252	0.052	0.027	0.192	0.049
I-710, Willow to 405	0.4890	0.0257	0.1114	0.0059	0.252	0.052	0.027	0.192	0.049
I-710, 405 to Del Amo	0.4890	0.0257	0.1114	0.0059	0.252	0.052	0.027	0.192	0.049
I-710, Del Amo to Long Beach Blvd Interchange	0.4890	0.0257	0.1114	0.0059	0.252	0.052	0.027	0.192	0.049
I-710, Long Beach Boulevard to SR-91	0.4890	0.0257	0.1114	0.0059	0.252	0.052	0.027	0.192	0.049
PCH, I-110 to Alameda	0.4890	0.0257	0.1114	0.0059	0.431	0.046	0.069	0.333	0.059
PCH, Alameda to SR-103	0.4890	0.0257	0.1114	0.0059	0.431	0.046	0.069	0.333	0.059
PCH, SR-103 to I-710	0.4890	0.0257	0.1114	0.0059	0.431	0.046	0.069	0.333	0.059
Sepulveda, I-110 to Avalon	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
Sepulveda, Avalon to Alameda	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
Sepulveda, Alameda to ICTF	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
Sepulveda, ICTF to SR-103	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
Del Amo, I-110 to Wilmington	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
Del Amo, Wilminton to Alameda	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
Del Amo, Alameda to I-710	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
223rd Street, I-110 to Avalon	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
223rd Street, Avalon to Wilmington	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
223rd Street, Wilmington to Alameda	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053
W Wardlow from Alameda to I-710	0.4890	0.0257	0.1114	0.0059	0.376	0.045	0.051	0.288	0.053

Table B-12
2030 Alternative 2
Maximum Hourly Truck Emissions

	Port		Port		SCAG	SCAG	
	LNG TOG	LNG PM	Dsl + LNG Dsl TOG	Dsl + LNG DPM	Gasoline TOG	Dsl Exhst Dsl TOG	Dsl Exhst PM
2030 Alternative 2	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	0.639	0.146	0.76	0.25	0.00	0.00	0.00
Henry Ford Ramps	0.030	0.007	0.14	0.01	0.00	0.00	0.00
Henry Ford n/o Ramps to Alameda	0.113	0.026	0.72	0.05	0.00	0.01	0.00
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	0.894	0.204	1.15	0.30	0.00	0.00	0.00
SR-103 Anaheim to PCH	0.549	0.125	0.68	0.18	0.00	0.00	0.00
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	0.381	0.087	0.46	0.12	0.00	0.01	0.00
SR-103 Ramps south of Sepulveda/Willow	0.000	0.000	0.00	0.00			
NB Sepulveda Ramp (G2 Line)	0.031	0.007	0.05	0.02	0.00	0.00	0.00
SB Sepulveda Ramp (F2 Ramp)	0.022	0.005	0.04	0.01	0.00	0.00	0.00
SR-103 Existing, End Ramps to Sepulveda/Willow	0.000	0.000	0.00	0.00			
SB Sepulveda Ramp Traffic	0.004	0.001	0.01	0.00	0.00	0.00	0.00
SB+NB Sepulveda Ramp Traffic	0.016	0.004	0.03	0.01	0.00	0.00	0.00
SR-103, Realignment to End (223rd/Wardlow)	1.232	0.281	1.30	0.34	0.00	0.01	0.00
E and W Harry Bridges, Figueroa to start Alameda	0.307	0.070	0.39	0.06	0.00	0.01	0.00
Alameda beginning (E Harry Bridges) to Anaheim	0.184	0.042	0.23	0.03	0.00	0.01	0.00
Alameda Anaheim to Henry Ford	0.069	0.016	0.08	0.01	0.00	0.01	0.00
Alameda, Henry Ford to PCH	0.102	0.023	0.18	0.03	0.00	0.01	0.00
Alameda PCH to 405	0.584	0.133	0.82	0.17	0.01	0.10	0.02
Alameda 405 to del Amo	0.880	0.201	1.48	0.25	0.01	0.08	0.02
Alameda, del Amo to South Santa Fe Avenue	0.545	0.124	0.51	0.09	0.01	0.04	0.01
Alameda, South Santa Fe Avenue to SR-91	0.361	0.082	0.53	0.09	0.01	0.03	0.01
I-110, "C" Street Interchange to Anaheim	0.177	0.040	0.34	0.09	0.00	0.03	0.01
I-110, Anaheim to PCH	0.473	0.108	0.49	0.13	0.01	0.05	0.02
1-110, PCH to Sepulveda	0.823	0.188	0.85	0.22	0.02	0.12	0.03
I-110, Sepulveda to Carson	0.870	0.198	0.90	0.23	0.03	0.18	0.05
I-110, Carson to Del Amo	0.546	0.125	0.56	0.15	0.02	0.13	0.04
I-110, Del Amo to 405	0.384	0.088	0.39	0.10	0.02	0.12	0.03
I-110, 405 to SR-91	0.499	0.114	0.53	0.14	0.04	0.25	0.07
I-710, Anaheim to PCH	0.605	0.138	0.87	0.18	0.00	0.03	0.01
I-710, PCH to Willow	1.291	0.294	1.75	0.36	0.01	0.06	0.01
I-710, Willow to 405	1.947	0.444	2.64	0.55	0.01	0.09	0.02
I-710, 405 to Del Amo	1.771	0.404	2.31	0.48	0.02	0.15	0.04
I-710, Del Amo to Long Beach Blvd Interchange	1.435	0.327	1.88	0.39	0.02	0.13	0.03
I-710, Long Beach Boulevard to SR-91	1.170	0.267	1.52	0.32	0.03	0.18	0.04
PCH, I-110 to Alameda	0.187	0.043	0.39	0.04	0.03	0.14	0.02
PCH, Alameda to SR-103	0.017	0.004	0.07	0.01	0.01	0.03	0.01
PCH, SR-103 to I-710	0.224	0.051	0.50	0.05	0.01	0.03	0.01
Sepulveda, I-110 to Avalon	0.020	0.005	0.05	0.01	0.01	0.04	0.01
Sepulveda, Avalon to Alameda	0.024	0.006	0.13	0.02	0.01	0.05	0.01
Sepulveda, Alameda to ICTF	0.030	0.007	0.07	0.01	0.00	0.01	0.00
Sepulveda, ICTF to SR-103	0.025	0.006	0.08	0.01	0.00	0.00	0.00
Del Amo, I-110 to Wilmington	0.026	0.006	0.11	0.01	0.02	0.11	0.02
Del Amo, Wilminton to Alameda	0.034	0.008	0.04	0.01	0.01	0.04	0.01
Del Amo, Alameda to I-710	0.026	0.006	0.07	0.01	0.01	0.05	0.01
223rd Street, I-110 to Avalon	0.007	0.002	0.01	0.00	0.01	0.04	0.01
223rd Street, Avalon to Wilmington	0.010	0.002	0.03	0.00	0.01	0.03	0.01
223rd Street, Wilmington to Alameda	0.064	0.015	0.09	0.01	0.01	0.04	0.01
W Wardlow from Alameda to I-710	0.041	0.009	0.27	0.03	0.01	0.07	0.01

Table B-12
2030 Alternative 2
Maximum Hourly Truck Emissions

	DPM	Acetaldehyde	Acrolein	Ammonia	Antimony	Arsenic	Benzene	Bromine	1,3-Butadiene	Cadmium	Chlorine	Chromium (hex)	Copper	Ethylbenzene	Formaldehyde
	9901	75070	107028	7664417	7440360	7440382	71432	7726956	106990	7440439	7782505	18540299	7440508	100414	50000
2030 Alternative 2	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr		lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	2.47E-01	5.60E-02	1.48E-07	8.31E-04	8.88E-06	1.23E-06	1.52E-02	8.88E-06	1.45E-03	9.86E-06	8.48E-05	1.48E-07	6.16E-06	2.32E-03	1.12E-01
Henry Ford Ramps	1.00E-02	1.05E-02	0.00E+00	3.37E-05	3.60E-07	5.00E-08	2.86E-03	3.60E-07	2.71E-04	4.00E-07	3.44E-06	6.00E-09	2.50E-07	4.36E-04	2.10E-02
Henry Ford n/o Ramps to Alameda	5.16E-02	5.39E-02	2.13E-06	1.74E-04	1.86E-06	2.58E-07	1.47E-02	1.86E-06	1.40E-03	2.06E-06	1.77E-05	3.09E-08	1.29E-06	2.23E-03	1.08E-01
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	2.96E-01	8.43E-02	2.26E-07	9.97E-04	1.07E-05	1.48E-06	2.29E-02	1.07E-05	2.18E-03	1.18E-05	1.02E-04	1.78E-07	7.40E-06	3.50E-03	1.69E-01
SR-103 Anaheim to PCH	1.76E-01	5.02E-02	6.90E-07	5.94E-04	6.35E-06	8.82E-07	1.37E-02	6.35E-06	1.30E-03	7.05E-06	6.07E-05	1.06E-07	4.41E-06	2.08E-03	1.00E-01
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	1.20E-01	3.41E-02	9.77E-07	4.04E-04	4.32E-06	6.00E-07	9.31E-03	4.32E-06	8.86E-04	4.80E-06	4.13E-05	7.20E-08	3.00E-06	1.42E-03	6.83E-02
SR-103 Ramps south of Sepulveda/Willow															
NB Sepulveda Ramp (G2 Line)	2.05E-02	3.76E-03	2.29E-07	6.90E-05	7.38E-07	1.02E-07	1.03E-03	7.38E-07	9.80E-05	8.20E-07	7.05E-06	1.23E-08	5.12E-07	1.56E-04	7.52E-03
SB Sepulveda Ramp (F2 Ramp)	1.44E-02	2.64E-03	1.61E-07	4.86E-05	5.19E-07	7.21E-08	7.23E-04	5.19E-07	6.90E-05	5.77E-07	4.96E-06	8.65E-09	3.60E-07	1.10E-04	5.29E-03
SR-103 Existing, End Ramps to Sepulveda/Willow															
SB Sepulveda Ramp Traffic	2.66E-03	4.87E-04	2.96E-08	8.95E-06	9.56E-08	1.33E-08	1.33E-04	9.56E-08	1.27E-05	1.06E-07	9.14E-07	1.59E-09	6.64E-08	2.02E-05	9.75E-04
SB+NB Sepulveda Ramp Traffic	1.04E-02	1.91E-03	1.16E-07	3.52E-05	3.76E-07	5.22E-08	5.23E-04	3.76E-07	4.99E-05	4.17E-07	3.59E-06	6.26E-09	2.61E-07	7.94E-05	3.83E-03
SR-103, Realignment to End (223rd/Wardlow)	3.38E-01	9.63E-02	1.61E-06	1.14E-03	1.22E-05	1.69E-06	2.62E-02	1.22E-05	2.50E-03	1.35E-05	1.16E-04	2.03E-07	8.45E-06	3.99E-03	1.93E-01
E and W Harry Bridges, Figueroa to start Alameda	5.80E-02	2.96E-02	2.16E-06	1.95E-04	2.09E-06	2.90E-07	8.10E-03	2.09E-06	7.74E-04	2.32E-06	1.99E-05	3.48E-08	1.45E-06	1.23E-03	5.93E-02
Alameda beginning (E Harry Bridges) to Anaheim	3.47E-02	1.76E-02	2.19E-06	1.17E-04	1.25E-06	1.74E-07	4.83E-03	1.25E-06	4.64E-04	1.39E-06	1.20E-05	2.08E-08	8.68E-07	7.30E-04	3.52E-02
Alameda Anaheim to Henry Ford	1.29E-02	6.44E-03	1.40E-06	4.35E-05	4.64E-07	6.45E-08	1.78E-03	4.64E-07	1.72E-04	5.16E-07	4.44E-06	7.74E-09	3.23E-07	2.67E-04	1.29E-02
Alameda, Henry Ford to PCH	2.62E-02	1.34E-02	1.14E-06	8.82E-05	9.42E-07	1.31E-07	3.68E-03	9.42E-07	3.52E-04	1.05E-06	9.01E-06	1.57E-08	6.55E-07	5.57E-04	2.69E-02
Alameda PCH to 405	1.94E-01	6.73E-02	1.69E-05	6.54E-04	6.98E-06	9.70E-07	1.86E-02	6.98E-06	1.81E-03	7.76E-06	6.67E-05	1.16E-07	4.85E-06	2.79E-03	1.35E-01
Alameda 405 to del Amo	2.67E-01	1.15E-01	1.47E-05	9.00E-04	9.61E-06	1.34E-06	3.16E-02	9.61E-06	3.03E-03	1.07E-05	9.19E-05	1.60E-07	6.68E-06	4.77E-03	2.30E-01
Alameda, del Amo to South Santa Fe Avenue	9.38E-02	3.99E-02	6.47E-06	3.16E-04	3.38E-06	4.69E-07	1.10E-02	3.38E-06	1.06E-03	3.75E-06	3.23E-05	5.63E-08	2.35E-06	1.66E-03	8.00E-02
Alameda, South Santa Fe Avenue to SR-91	9.73E-02	4.18E-02	6.06E-06	3.28E-04	3.50E-06	4.87E-07	1.15E-02	3.50E-06	1.10E-03	3.89E-06	3.35E-05	5.84E-08	2.43E-06	1.73E-03	8.37E-02
I-110, "C" Street Interchange to Anaheim	9.72E-02	2.73E-02	4.98E-06	3.27E-04	3.50E-06	4.86E-07	7.53E-03	3.50E-06	7.27E-04	3.89E-06	3.34E-05	5.83E-08	2.43E-06	1.13E-03	5.48E-02
I-110, Anaheim to PCH	1.43E-01	4.01E-02	8.95E-06	4.80E-04	5.13E-06	7.13E-07	1.11E-02	5.13E-06	1.07E-03	5.70E-06	4.90E-05	8.55E-08	3.56E-06	1.66E-03	8.04E-02
1-110, PCH to Sepulveda	2.54E-01	7.12E-02	1.99E-05	8.55E-04	9.14E-06	1.27E-06	1.97E-02	9.14E-06	1.92E-03	1.02E-05	8.73E-05	1.52E-07	6.35E-06	2.95E-03	1.43E-01
I-110, Sepulveda to Carson	2.86E-01	7.97E-02	3.13E-05	9.63E-04	1.03E-05	1.43E-06	2.22E-02	1.03E-05	2.19E-03	1.14E-05	9.83E-05	1.71E-07	7.14E-06	3.30E-03	1.60E-01
I-110, Carson to Del Amo	1.83E-01	5.09E-02	2.19E-05	6.17E-04	6.59E-06	9.15E-07	1.43E-02	6.59E-06	1.40E-03	7.32E-06	6.30E-05	1.10E-07	4.58E-06	2.11E-03	1.02E-01
I-110, Del Amo to 405	1.36E-01	3.76E-02	1.98E-05	4.58E-04	4.89E-06	6.80E-07	1.06E-02	4.89E-06	1.05E-03	5.44E-06	4.68E-05	8.16E-08	3.40E-06	1.56E-03	7.54E-02
I-110, 405 to SR-91	2.11E-01	5.76E-02	4.29E-05	7.10E-04	7.59E-06	1.05E-06	1.64E-02	7.59E-06	1.66E-03	8.43E-06	7.25E-05	1.26E-07	5.27E-06	2.38E-03	1.16E-01
I-710, Anaheim to PCH	1.86E-01	6.56E-02	4.34E-06	6.26E-04	6.69E-06	9.30E-07	1.79E-02	6.69E-06	1.71E-03	7.44E-06	6.40E-05	1.12E-07	4.65E-06	2.72E-03	1.31E-01
I-710, PCH to Willow	3.76E-01	1.33E-01	9.69E-06	1.27E-03	1.36E-05	1.88E-06	3.63E-02	1.36E-05	3.47E-03	1.51E-05	1.30E-04	2.26E-07	9.41E-06	5.50E-03	2.66E-01
I-710, Willow to 405	5.69E-01	2.01E-01	1.55E-05	1.92E-03	2.05E-05	2.85E-06	5.48E-02	2.05E-05	5.24E-03	2.28E-05	1.96E-04	3.41E-07	1.42E-05	8.32E-03	4.01E-01
I-710, 405 to Del Amo	5.18E-01	1.81E-01	2.60E-05	1.75E-03	1.86E-05	2.59E-06	4.98E-02	1.86E-05	4.79E-03	2.07E-05	1.78E-04	3.11E-07	1.29E-05	7.52E-03	3.63E-01
I-710, Del Amo to Long Beach Blvd Interchange	4.22E-01	1.48E-01	2.28E-05	1.42E-03	1.52E-05	2.11E-06	4.06E-02	1.52E-05	3.91E-03	1.69E-05	1.45E-04	2.53E-07	1.06E-05	6.13E-03	2.96E-01
I-710, Long Beach Boulevard to SR-91	3.60E-01	1.25E-01	3.02E-05	1.21E-03	1.30E-05	1.80E-06	3.46E-02	1.30E-05	3.35E-03	1.44E-05	1.24E-04	2.16E-07	9.01E-06	5.19E-03	2.51E-01
PCH, I-110 to Alameda	6.66E-02	3.85E-02	3.42E-05	2.24E-04	2.40E-06	3.33E-07	1.11E-02	2.40E-06	1.13E-03	2.66E-06	2.29E-05	3.99E-08	1.66E-06	1.60E-03	7.74E-02
PCH, Alameda to SR-103	1.25E-02	7.08E-03	7.73E-06	4.22E-05	4.51E-07	6.26E-08	2.07E-03	4.51E-07	2.14E-04	5.01E-07	4.31E-06	7.51E-09	3.13E-07	2.93E-04	1.42E-02
PCH, SR-103 to I-710	6.03E-02	3.89E-02	8.32E-06	2.03E-04	2.17E-06	3.02E-07	1.07E-02	2.17E-06	1.04E-03	2.41E-06	2.08E-05	3.62E-08	1.51E-06	1.61E-03	7.79E-02
Sepulveda, I-110 to Avalon	1.26E-02	6.26E-03	7.94E-06	4.25E-05	4.54E-07	6.30E-08	1.85E-03	4.54E-07	1.94E-04	5.04E-07	4.33E-06	7.56E-09	3.15E-07	2.59E-04	1.26E-02
Sepulveda, Avalon to Alameda	2.56E-02	1.36E-02	1.19E-05	8.64E-05	9.23E-07	1.28E-07	3.91E-03	9.23E-07	3.99E-04	1.03E-06	8.82E-06	1.54E-08	6.41E-07	5.62E-04	2.72E-02
Sepulveda, Alameda to ICTF	1.04E-02	5.94E-03	2.13E-06	3.51E-05	3.75E-07	5.22E-08	1.65E-03	3.75E-07	1.62E-04	4.17E-07	3.59E-06	6.26E-09	2.61E-07	2.46E-04	1.19E-02
Sepulveda, ICTF to SR-103	9.85E-03	5.90E-03	4.63E-07	3.32E-05	3.55E-07	4.93E-08	1.61E-03	3.55E-07	1.54E-04	3.94E-07	3.39E-06	5.91E-09	2.46E-07	2.45E-04	1.18E-02
Del Amo, I-110 to Wilmington	3.25E-02	1.57E-02	2.30E-05	1.09E-04	1.17E-06	1.62E-07	4.70E-03	1.17E-06	5.00E-04	1.30E-06	1.12E-05	1.95E-08	8.12E-07	6.51E-04	3.17E-02
Del Amo, Wilminton to Alameda	1.31E-02	6.23E-03	9.44E-06	4.41E-05	4.71E-07	6.54E-08	1.87E-03	4.71E-07	1.99E-04	5.23E-07	4.50E-06	7.85E-09	3.27E-07	2.58E-04	1.25E-02
Del Amo, Alameda to I-710	1.76E-02	8.68E-03	1.13E-05	5.92E-05	6.32E-07	8.78E-08	2.57E-03	6.32E-07	2.70E-04	7.03E-07	6.04E-06	1.05E-08	4.39E-07	3.59E-04	1.75E-02
223rd Street, I-110 to Avalon	8.91E-03	3.94E-03	8.45E-06	3.00E-05	3.21E-07	4.46E-08	1.22E-03	3.21E-07	1.36E-04	3.57E-07	3.07E-06	5.35E-09	2.23E-07	1.63E-04	7.94E-03
223rd Street, Avalon to Wilmington	9.47E-03	4.44E-03	7.51E-06	3.19E-05	3.41E-07	4.73E-08	1.34E-03	3.41E-07	1.45E-04	3.79E-07	3.26E-06	5.68E-09	2.37E-07	1.83E-04	8.94E-03
223rd Street, Wilmington to Alameda	1.80E-02	9.32E-03	8.53E-06	6.06E-05	6.48E-07	9.00E-08	2.69E-03	6.48E-07	2.75E-04	7.20E-07	6.19E-06	1.08E-08	4.50E-07	3.86E-04	1.87E-02
W Wardlow from Alameda to I-710	4.53E-02	2.50E-02	1.53E-05	1.52E-04	1.63E-06	2.26E-07	7.07E-03	1.63E-06	7.08E-04	1.81E-06	1.56E-05	2.72E-08	1.13E-06	1.03E-03	5.01E-02

Table B-12
2030 Alternative 2
Maximum Hourly Truck Emissions

	Maximum Hourly Toxic Emissions from Trucks (continued)														
	n-Hexane	Lead	Manganese	MEK	Mercury	Methanol	Nickel	Propylene	Selenium	Sthrene	Sulfates	Toluene	Vanadium	Xylene	Zinc
	110543	7439921	7439965	78933	7439976	67561	7440020	115071	7782492	100425	9960	108883	7440622	1330207	7440666
2030 Alternative 2	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	1.20E-03	1.04E-05	9.86E-06	1.12E-02	7.40E-06	2.28E-04	4.69E-06	1.98E-02	2.47E-06	4.42E-04	4.29E-03	1.12E-02	7.15E-06	7.93E-03	1.08E-04
Henry Ford Ramps	2.24E-04	4.20E-07	4.00E-07	2.11E-03	3.00E-07	4.28E-05	1.90E-07	3.71E-03	1.00E-07	8.28E-05	1.74E-04	2.10E-03	2.90E-07	1.49E-03	4.38E-06
Henry Ford n/o Ramps to Alameda	1.15E-03	2.17E-06	2.06E-06	1.08E-02	1.55E-06	2.20E-04	9.79E-07	1.90E-02	5.16E-07	4.25E-04	8.97E-04	1.08E-02	1.49E-06	7.63E-03	2.26E-05
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.80E-03	1.24E-05	1.18E-05	1.69E-02	8.88E-06	3.44E-04	5.62E-06	2.98E-02	2.96E-06	6.65E-04	5.15E-03	1.69E-02	8.58E-06	1.19E-02	1.30E-04
SR-103 Anaheim to PCH	1.07E-03	7.41E-06	7.05E-06	1.01E-02	5.29E-06	2.05E-04	3.35E-06	1.77E-02	1.76E-06	3.96E-04	3.07E-03	1.01E-02	5.11E-06	7.11E-03	7.73E-05
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	7.29E-04	5.04E-06	4.80E-06	6.86E-03	3.60E-06	1.39E-04	2.28E-06	1.21E-02	1.20E-06	2.69E-04	2.09E-03	6.84E-03	3.48E-06	4.83E-03	5.26E-05
SR-103 Ramps south of Sepulveda/Willow															
NB Sepulveda Ramp (G2 Line)	8.02E-05	8.61E-07	8.20E-07	7.55E-04	6.15E-07	1.53E-05	3.89E-07	1.33E-03	2.05E-07	2.96E-05	3.57E-04	7.53E-04	5.94E-07	5.32E-04	8.97E-06
SB Sepulveda Ramp (F2 Ramp)	5.65E-05	6.06E-07	5.77E-07	5.31E-04	4.33E-07	1.08E-05	2.74E-07	9.34E-04	1.44E-07	2.09E-05	2.51E-04	5.30E-04	4.18E-07	3.74E-04	6.32E-06
SR-103 Existing, End Ramps to Sepulveda/Willow															
SB Sepulveda Ramp Traffic	1.04E-05	1.12E-07	1.06E-07	9.78E-05	7.97E-08	1.99E-06	5.05E-08	1.72E-04	2.66E-08	3.84E-06	4.62E-05	9.76E-05	7.70E-08	6.90E-05	1.16E-06
SB+NB Sepulveda Ramp Traffic	4.09E-05	4.38E-07	4.17E-07	3.84E-04	3.13E-07	7.81E-06	1.98E-07	6.76E-04	1.04E-07	1.51E-05	1.82E-04	3.83E-04	3.03E-07	2.71E-04	4.57E-06
SR-103, Realignment to End (223rd/Wardlow)	2.06E-03	1.42E-05	1.35E-05	1.93E-02	1.01E-05	3.93E-04	6.42E-06	3.40E-02	3.38E-06	7.60E-04	5.88E-03	1.93E-02	9.80E-06	1.36E-02	1.48E-04
E and W Harry Bridges, Figueroa to start Alameda	6.32E-04	2.44E-06	2.32E-06	5.95E-03	1.74E-06	1.21E-04	1.10E-06	1.05E-02	5.80E-07	2.34E-04	1.01E-03	5.93E-03	1.68E-06	4.19E-03	2.54E-05
Alameda beginning (E Harry Bridges) to Anaheim	3.76E-04	1.46E-06	1.39E-06	3.54E-03	1.04E-06	7.18E-05	6.60E-07	6.22E-03	3.47E-07	1.39E-04	6.04E-04	3.53E-03	1.01E-06	2.49E-03	1.52E-05
Alameda Anaheim to Henry Ford	1.37E-04	5.42E-07	5.16E-07	1.29E-03	3.87E-07	2.63E-05	2.45E-07	2.27E-03	1.29E-07	5.08E-05	2.24E-04	1.29E-03	3.74E-07	9.11E-04	5.65E-06
Alameda, Henry Ford to PCH	2.87E-04	1.10E-06	1.05E-06	2.70E-03	7.85E-07	5.48E-05	4.97E-07	4.75E-03	2.62E-07	1.06E-04	4.56E-04	2.69E-03	7.59E-07	1.90E-03	1.15E-05
Alameda PCH to 405	1.44E-03	8.15E-06	7.76E-06	1.35E-02	5.82E-06	2.74E-04	3.69E-06	2.38E-02	1.94E-06	5.30E-04	3.38E-03	1.35E-02	5.63E-06	9.52E-03	8.50E-05
Alameda 405 to del Amo	2.46E-03	1.12E-05	1.07E-05	2.31E-02	8.01E-06	4.70E-04	5.07E-06	4.06E-02	2.67E-06	9.08E-04	4.65E-03	2.31E-02	7.74E-06	1.63E-02	1.17E-04
Alameda, del Amo to South Santa Fe Avenue	8.52E-04	3.94E-06	3.75E-06	8.02E-03	2.81E-06	1.63E-04	1.78E-06	1.41E-02	9.38E-07	3.15E-04	1.63E-03	8.00E-03	2.72E-06	5.65E-03	4.11E-05
Alameda, South Santa Fe Avenue to SR-91	8.92E-04	4.09E-06	3.89E-06	8.39E-03	2.92E-06	1.71E-04	1.85E-06	1.48E-02	9.73E-07	3.30E-04	1.69E-03	8.37E-03	2.82E-06	5.92E-03	4.26E-05
I-110, "C" Street Interchange to Anaheim	5.84E-04	4.08E-06	3.89E-06	5.49E-03	2.91E-06	1.12E-04	1.85E-06	9.65E-03	9.72E-07	2.16E-04	1.69E-03	5.48E-03	2.82E-06	3.87E-03	4.26E-05
I-110, Anaheim to PCH	8.56E-04	5.99E-06	5.70E-06	8.05E-03	4.28E-06	1.64E-04	2.71E-06	1.42E-02	1.43E-06	3.16E-04	2.48E-03	8.03E-03	4.13E-06	5.68E-03	6.24E-05
1-110, PCH to Sepulveda	1.52E-03	1.07E-05	1.02E-05	1.43E-02	7.62E-06	2.90E-04	4.82E-06	2.51E-02	2.54E-06	5.62E-04	4.42E-03	1.43E-02	7.36E-06	1.01E-02	1.11E-04
I-110, Sepulveda to Carson	1.70E-03	1.20E-05	1.14E-05	1.60E-02	8.57E-06	3.25E-04	5.43E-06	2.81E-02	2.86E-06	6.28E-04	4.97E-03	1.59E-02	8.29E-06	1.13E-02	1.25E-04
I-110, Carson to Del Amo	1.09E-03	7.69E-06	7.32E-06	1.02E-02	5.49E-06	2.08E-04	3.48E-06	1.80E-02	1.83E-06	4.01E-04	3.18E-03	1.02E-02	5.31E-06	7.20E-03	8.02E-05
I-110, Del Amo to 405	8.02E-04	5.71E-06	5.44E-06	7.55E-03	4.08E-06	1.53E-04	2.58E-06	1.33E-02	1.36E-06	2.96E-04	2.37E-03	7.53E-03	3.94E-06	5.32E-03	5.96E-05
I-110, 405 to SR-91	1.23E-03	8.85E-06	8.43E-06	1.15E-02	6.32E-06	2.35E-04	4.00E-06	2.03E-02	2.11E-06	4.53E-04	3.67E-03	1.15E-02	6.11E-06	8.14E-03	9.23E-05
I-710, Anaheim to PCH	1.40E-03	7.81E-06	7.44E-06	1.32E-02	5.58E-06	2.68E-04	3.53E-06	2.32E-02	1.86E-06	5.17E-04	3.24E-03	1.31E-02	5.39E-06	9.29E-03	8.14E-05
I-710, PCH to Willow	2.83E-03	1.58E-05	1.51E-05	2.67E-02	1.13E-05	5.41E-04	7.15E-06	4.69E-02	3.76E-06	1.05E-03	6.55E-03	2.66E-02	1.09E-05	1.88E-02	1.65E-04
I-710, Willow to 405	4.28E-03	2.39E-05	2.28E-05	4.03E-02	1.71E-05	8.18E-04	1.08E-05	7.08E-02	5.69E-06	1.58E-03	9.90E-03	4.02E-02	1.65E-05	2.84E-02	2.49E-04
I-710, 405 to Del Amo	3.87E-03	2.18E-05	2.07E-05	3.64E-02	1.55E-05	7.40E-04	9.84E-06	6.40E-02	5.18E-06	1.43E-03	9.01E-03	3.63E-02	1.50E-05	2.57E-02	2.27E-04
I-710, Del Amo to Long Beach Blvd Interchange	3.15E-03	1.77E-05	1.69E-05	2.97E-02	1.27E-05	6.03E-04	8.02E-06	5.22E-02	4.22E-06	1.16E-03	7.35E-03	2.96E-02	1.22E-05	2.09E-02	1.85E-04
I-710, Long Beach Boulevard to SR-91	2.67E-03	1.51E-05	1.44E-05	2.51E-02	1.08E-05	5.10E-04	6.85E-06	4.42E-02	3.60E-06	9.86E-04	6.27E-03	2.50E-02	1.05E-05	1.77E-02	1.58E-04
PCH, I-110 to Alameda	8.21E-04	2.80E-06	2.66E-06	7.73E-03	2.00E-06	1.57E-04	1.27E-06	1.36E-02	6.66E-07	3.03E-04	1.16E-03	7.70E-03	1.93E-06	5.44E-03	2.92E-05
PCH, Alameda to SR-103	1.51E-04	5.26E-07	5.01E-07	1.42E-03	3.76E-07	2.88E-05	2.38E-07	2.50E-03	1.25E-07	5.57E-05	2.18E-04	1.42E-03	3.63E-07	1.00E-03	5.48E-06
PCH, SR-103 to I-710	8.30E-04	2.53E-06	2.41E-06	7.81E-03	1.81E-06	1.59E-04	1.15E-06	1.37E-02	6.03E-07	3.07E-04	1.05E-03	7.79E-03	1.75E-06	5.50E-03	2.64E-05
Sepulveda, I-110 to Avalon	1.33E-04	5.29E-07	5.04E-07	1.25E-03	3.78E-07	2.55E-05	2.39E-07	2.20E-03	1.26E-07	4.92E-05	2.19E-04	1.25E-03	3.65E-07	8.83E-04	5.52E-06
Sepulveda, Avalon to Alameda	2.89E-04	1.08E-06	1.03E-06	2.72E-03	7.69E-07	5.52E-05	4.87E-07	4.78E-03	2.56E-07	1.07E-04	4.46E-04	2.71E-03	7.44E-07	1.92E-03	1.12E-05
Sepulveda, Alameda to ICTF	1.27E-04	4.38E-07	4.17E-07	1.19E-03	3.13E-07	2.42E-05	1.98E-07	2.10E-03	1.04E-07	4.68E-05	1.81E-04	1.19E-03	3.02E-07	8.40E-04	4.57E-06
Sepulveda, ICTF to SR-103	1.26E-04	4.14E-07	3.94E-07	1.19E-03	2.96E-07	2.41E-05	1.87E-07	2.08E-03	9.85E-08	4.66E-05	1.71E-04	1.18E-03	2.86E-07	8.36E-04	4.32E-06
Del Amo, I-110 to Wilmington	3.35E-04	1.36E-06	1.30E-06	3.15E-03	9.74E-07	6.40E-05	6.17E-07	5.54E-03	3.25E-07	1.24E-04	5.65E-04	3.14E-03	9.41E-07	2.22E-03	1.42E-05
Del Amo, Wilminton to Alameda	1.33E-04	5.50E-07	5.23E-07	1.25E-03	3.93E-07	2.53E-05	2.49E-07	2.19E-03	1.31E-07	4.90E-05	2.28E-04	1.24E-03	3.80E-07	8.80E-04	5.73E-06
Del Amo, Alameda to I-710	1.85E-04	7.38E-07	7.03E-07	1.74E-03	5.27E-07	3.53E-05	3.34E-07	3.06E-03	1.76E-07	6.83E-05	3.06E-04	1.73E-03	5.09E-07	1.23E-03	7.70E-06
223rd Street, I-110 to Avalon	8.37E-05	3.74E-07	3.57E-07	7.87E-04	2.67E-07	1.60E-05	1.69E-07	1.38E-03	8.91E-08	3.09E-05	1.55E-04	7.85E-04	2.58E-07	5.55E-04	3.90E-06
223rd Street, Avalon to Wilmington	9.44E-05	3.98E-07	3.79E-07	8.88E-04	2.84E-07	1.80E-05	1.80E-07	1.56E-03	9.47E-08	3.49E-05	1.65E-04	8.86E-04	2.75E-07	6.26E-04	4.15E-06
223rd Street, Wilmington to Alameda	1.99E-04	7.56E-07	7.20E-07	1.87E-03	5.40E-07	3.79E-05	3.42E-07	3.28E-03	1.80E-07	7.34E-05	3.13E-04	1.86E-03	5.22E-07	1.32E-03	7.88E-06
W Wardlow from Alameda to I-710	5.32E-04	1.90E-06	1.81E-06	5.01E-03	1.36E-06	1.02E-04	8.60E-07	8.81E-03	4.53E-07	1.97E-04	7.87E-04	5.00E-03	1.31E-06	3.53E-03	1.98E-05

Table B-12
2030 Alternative 2
Maximum Hourly Truck Emissions

	Port Trucks - - LNG Exhaust								Port Trucks - - LNG Exhaust								
	TOG	Acetaldehyde	Benzene	Formaldehyde	n-Hexane	Propylene	Toluene	Xylenes	PM10	Bromine	Chlorine	Chromium (hex)	Copper	Manganese	Nickel	Sulfates	Zinc
		75070	71432	50000	110543	115071	108883	1330207		7726956	7782505	18540299	7440508	7439965	7440020	9960	7440666
2030 Alternative 2	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	0.639	1.92E-04	7.03E-04	5.18E-03	1.28E-04	1.08E-02	2.56E-04	1.28E-04	0.146	7.29E-05	1.02E-02	3.64E-06	7.29E-05	7.29E-05	7.29E-05	6.56E-02	7.29E-05
Henry Ford Ramps	0.030	8.91E-06	3.27E-05	2.41E-04	5.94E-06	5.02E-04	1.19E-05	5.94E-06	0.007	3.38E-06	4.74E-04	1.69E-07	3.38E-06	3.38E-06	3.38E-06	3.05E-03	3.38E-06
Henry Ford n/o Ramps to Alameda	0.113	3.40E-05	1.24E-04	9.17E-04	2.26E-05	1.91E-03	4.53E-05	2.26E-05	0.026	1.29E-05	1.81E-03	6.45E-07	1.29E-05	1.29E-05	1.29E-05	1.16E-02	1.29E-05
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	0.894	2.68E-04	9.83E-04	7.24E-03	1.79E-04	1.51E-02	3.57E-04	1.79E-04	0.204	1.02E-04	1.43E-02	5.09E-06	1.02E-04	1.02E-04	1.02E-04	9.17E-02	1.02E-04
SR-103 Anaheim to PCH	0.549	1.65E-04	6.03E-04	4.44E-03	1.10E-04	9.27E-03	2.19E-04	1.10E-04	0.125	6.25E-05	8.75E-03	3.13E-06	6.25E-05	6.25E-05	6.25E-05	5.63E-02	6.25E-05
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	0.381	1.14E-04	4.19E-04	3.08E-03	7.61E-05	6.43E-03	1.52E-04	7.61E-05	0.087	4.34E-05	6.07E-03	2.17E-06	4.34E-05	4.34E-05	4.34E-05	3.90E-02	4.34E-05
SR-103 Ramps south of Sepulveda/Willow		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NB Sepulveda Ramp (G2 Line)	0.031	9.30E-06	3.41E-05	2.51E-04	6.20E-06	5.24E-04	1.24E-05	6.20E-06	0.007	3.53E-06	4.95E-04	1.77E-07	3.53E-06	3.53E-06	3.53E-06	3.18E-03	3.53E-06
SB Sepulveda Ramp (F2 Ramp)	0.022	6.55E-06	2.40E-05	1.77E-04	4.37E-06	3.69E-04	8.73E-06	4.37E-06	0.005	2.49E-06	3.48E-04	1.24E-07	2.49E-06	2.49E-06	2.49E-06	2.24E-03	2.49E-06
SR-103 Existing, End Ramps to Sepulveda/Willow																	
SB Sepulveda Ramp Traffic	0.004	1.21E-06	4.42E-06	3.26E-05	8.04E-07	6.79E-05	1.61E-06	8.04E-07	0.001	4.58E-07	6.41E-05	2.29E-08	4.58E-07	4.58E-07	4.58E-07	4.12E-04	4.58E-07
SB+NB Sepulveda Ramp Traffic	0.016	4.74E-06	1.74E-05	1.28E-04	3.16E-06	2.67E-04	6.32E-06	3.16E-06	0.004	1.80E-06	2.52E-04	9.00E-08	1.80E-06	1.80E-06	1.80E-06	1.62E-03	1.80E-06
SR-103, Realignment to End (223rd/Wardlow)	1.232	3.69E-04	1.35E-03	9.98E-03	2.46E-04	2.08E-02	4.93E-04	2.46E-04	0.281	1.40E-04	1.97E-02	7.02E-06	1.40E-04	1.40E-04	1.40E-04	1.26E-01	1.40E-04
E and W Harry Bridges, Figueroa to start Alameda	0.307	9.21E-05	3.38E-04	2.49E-03	6.14E-05	5.19E-03	1.23E-04	6.14E-05	0.070	3.50E-05	4.90E-03	1.75E-06	3.50E-05	3.50E-05	3.50E-05	3.15E-02	3.50E-05
Alameda beginning (E Harry Bridges) to Anaheim	0.184	5.52E-05	2.02E-04	1.49E-03	3.68E-05	3.11E-03	7.36E-05	3.68E-05	0.042	2.10E-05	2.93E-03	1.05E-06	2.10E-05	2.10E-05	2.10E-05	1.89E-02	2.10E-05
Alameda Anaheim to Henry Ford	0.069	2.08E-05	7.62E-05	5.61E-04	1.39E-05	1.17E-03	2.77E-05	1.39E-05	0.016	7.90E-06	1.11E-03	3.95E-07	7.90E-06	7.90E-06	7.90E-06	7.11E-03	7.90E-06
Alameda, Henry Ford to PCH	0.102	3.06E-05	1.12E-04	8.27E-04	2.04E-05	1.73E-03	4.08E-05	2.04E-05	0.023	1.16E-05	1.63E-03	5.82E-07	1.16E-05	1.16E-05	1.16E-05	1.05E-02	1.16E-05
Alameda PCH to 405	0.584	1.75E-04	6.43E-04	4.73E-03	1.17E-04	9.88E-03	2.34E-04	1.17E-04	0.133	6.66E-05	9.33E-03	3.33E-06	6.66E-05	6.66E-05	6.66E-05	5.99E-02	6.66E-05
Alameda 405 to del Amo	0.880	2.64E-04	9.68E-04	7.13E-03	1.76E-04	1.49E-02	3.52E-04	1.76E-04	0.201	1.00E-04	1.40E-02	5.02E-06	1.00E-04	1.00E-04	1.00E-04	9.03E-02	1.00E-04
Alameda, del Amo to South Santa Fe Avenue	0.545	1.63E-04	5.99E-04	4.41E-03	1.09E-04	9.21E-03	2.18E-04	1.09E-04	0.124	6.21E-05	8.69E-03	3.10E-06	6.21E-05	6.21E-05	6.21E-05	5.59E-02	6.21E-05
Alameda, South Santa Fe Avenue to SR-91	0.361	1.08E-04	3.97E-04	2.92E-03	7.21E-05	6.09E-03	1.44E-04	7.21E-05	0.082	4.11E-05	5.75E-03	2.05E-06	4.11E-05	4.11E-05	4.11E-05	3.70E-02	4.11E-05
I-110, "C" Street Interchange to Anaheim	0.177	5.32E-05	1.95E-04	1.44E-03	3.55E-05	3.00E-03	7.09E-05	3.55E-05	0.040	2.02E-05	2.83E-03	1.01E-06	2.02E-05	2.02E-05	2.02E-05	1.82E-02	2.02E-05
I-110, Anaheim to PCH	0.473	1.42E-04	5.20E-04	3.83E-03	9.45E-05	7.99E-03	1.89E-04	9.45E-05	0.108	5.39E-05	7.54E-03	2.69E-06	5.39E-05	5.39E-05	5.39E-05	4.85E-02	5.39E-05
1-110, PCH to Sepulveda	0.823	2.47E-04	9.05E-04	6.67E-03	1.65E-04	1.39E-02	3.29E-04	1.65E-04	0.188	9.38E-05	1.31E-02	4.69E-06	9.38E-05	9.38E-05	9.38E-05	8.44E-02	9.38E-05
I-110, Sepulveda to Carson	0.870	2.61E-04	9.57E-04	7.05E-03	1.74E-04	1.47E-02	3.48E-04	1.74E-04	0.198	9.92E-05	1.39E-02	4.96E-06	9.92E-05	9.92E-05	9.92E-05	8.93E-02	9.92E-05
I-110, Carson to Del Amo	0.546	1.64E-04	6.01E-04	4.42E-03	1.09E-04	9.23E-03	2.19E-04	1.09E-04	0.125	6.23E-05	8.72E-03	3.11E-06	6.23E-05	6.23E-05	6.23E-05	5.60E-02	6.23E-05
I-110, Del Amo to 405	0.384	1.15E-04	4.22E-04	3.11E-03	7.68E-05	6.49E-03	1.54E-04	7.68E-05	0.088	4.38E-05	6.13E-03	2.19E-06	4.38E-05	4.38E-05	4.38E-05	3.94E-02	4.38E-05
I-110, 405 to SR-91	0.499	1.50E-04	5.49E-04	4.04E-03	9.98E-05	8.43E-03	2.00E-04	9.98E-05	0.114	5.69E-05	7.96E-03	2.84E-06	5.69E-05	5.69E-05	5.69E-05	5.12E-02	5.69E-05
I-710, Anaheim to PCH	0.605	1.81E-04	6.65E-04	4.90E-03	1.21E-04	1.02E-02	2.42E-04	1.21E-04	0.138	6.89E-05	9.65E-03	3.45E-06	6.89E-05	6.89E-05	6.89E-05	6.20E-02	6.89E-05
I-710, PCH to Willow	1.291	3.87E-04	1.42E-03	1.05E-02	2.58E-04	2.18E-02	5.16E-04	2.58E-04	0.294	1.47E-04	2.06E-02	7.36E-06	1.47E-04	1.47E-04	1.47E-04	1.32E-01	1.47E-04
I-710, Willow to 405	1.947	5.84E-04	2.14E-03	1.58E-02	3.89E-04	3.29E-02	7.79E-04	3.89E-04	0.444	2.22E-04	3.11E-02	1.11E-05	2.22E-04	2.22E-04	2.22E-04	2.00E-01	2.22E-04
I-710, 405 to Del Amo	1.771	5.31E-04	1.95E-03	1.43E-02	3.54E-04	2.99E-02	7.08E-04	3.54E-04	0.404	2.02E-04	2.83E-02	1.01E-05	2.02E-04	2.02E-04	2.02E-04	1.82E-01	2.02E-04
I-710, Del Amo to Long Beach Blvd Interchange	1.435	4.30E-04	1.58E-03	1.16E-02	2.87E-04	2.42E-02	5.74E-04	2.87E-04	0.327	1.64E-04	2.29E-02	8.18E-06	1.64E-04	1.64E-04	1.64E-04	1.47E-01	1.64E-04
I-710, Long Beach Boulevard to SR-91	1.170	3.51E-04	1.29E-03	9.47E-03	2.34E-04	1.98E-02	4.68E-04	2.34E-04	0.267	1.33E-04	1.87E-02	6.67E-06	1.33E-04	1.33E-04	1.33E-04	1.20E-01	1.33E-04
PCH, I-110 to Alameda	0.187	5.60E-05	2.05E-04	1.51E-03	3.73E-05	3.16E-03	7.47E-05	3.73E-05	0.043	2.13E-05	2.98E-03	1.06E-06	2.13E-05	2.13E-05	2.13E-05	1.91E-02	2.13E-05
PCH, Alameda to SR-103	0.017	5.12E-06	1.88E-05	1.38E-04	3.41E-06	2.88E-04	6.82E-06	3.41E-06	0.004	1.94E-06	2.72E-04	9.72E-08	1.94E-06	1.94E-06	1.94E-06	1.75E-03	1.94E-06
PCH, SR-103 to I-710	0.224	6.73E-05	2.47E-04	1.82E-03	4.49E-05	3.79E-03	8.97E-05	4.49E-05	0.051	2.56E-05	3.58E-03	1.28E-06	2.56E-05	2.56E-05	2.56E-05	2.30E-02	2.56E-05
Sepulveda, I-110 to Avalon	0.020	6.02E-06	2.21E-05	1.63E-04	4.01E-06	3.39E-04	8.03E-06	4.01E-06	0.005	2.29E-06	3.20E-04	1.14E-07	2.29E-06	2.29E-06	2.29E-06	2.06E-03	2.29E-06
Sepulveda, Avalon to Alameda	0.024	7.25E-06	2.66E-05	1.96E-04	4.83E-06	4.09E-04	9.67E-06	4.83E-06	0.006	2.75E-06	3.86E-04	1.38E-07	2.75E-06	2.75E-06	2.75E-06	2.48E-03	2.75E-06
Sepulveda, Alameda to ICTF	0.030	8.99E-06	3.29E-05	2.43E-04	5.99E-06	5.06E-04	1.20E-05	5.99E-06	0.007	3.41E-06	4.78E-04	1.71E-07	3.41E-06	3.41E-06	3.41E-06	3.07E-03	3.41E-06
Sepulveda, ICTF to SR-103	0.025	7.38E-06	2.71E-05	1.99E-04	4.92E-06	4.16E-04	9.84E-06	4.92E-06	0.006	2.80E-06	3.93E-04	1.40E-07	2.80E-06	2.80E-06	2.80E-06	2.52E-03	2.80E-06
Del Amo, I-110 to Wilmington	0.026	7.66E-06	2.81E-05	2.07E-04	5.10E-06	4.31E-04	1.02E-05	5.10E-06	0.006	2.91E-06	4.07E-04	1.45E-07	2.91E-06	2.91E-06	2.91E-06	2.62E-03	2.91E-06
Del Amo, Wilminton to Alameda	0.034	1.03E-05	3.78E-05	2.78E-04	6.87E-06	5.80E-04	1.37E-05	6.87E-06	0.008	3.91E-06	5.48E-04	1.96E-07	3.91E-06	3.91E-06	3.91E-06	3.52E-03	3.91E-06
Del Amo, Alameda to I-710	0.026	7.78E-06	2.85E-05	2.10E-04	5.19E-06	4.39E-04	1.04E-05	5.19E-06	0.006	2.96E-06	4.14E-04	1.48E-07	2.96E-06	2.96E-06	2.96E-06	2.66E-03	2.96E-06
223rd Street, I-110 to Avalon	0.007	2.12E-06	7.76E-06	5.71E-05	1.41E-06	1.19E-04	2.82E-06	1.41E-06	0.002	8.04E-07	1.13E-04	4.02E-08	8.04E-07	8.04E-07	8.04E-07	7.23E-04	8.04E-07
223rd Street, Avalon to Wilmington	0.010	3.01E-06	1.10E-05	8.13E-05	2.01E-06	1.70E-04	4.02E-06	2.01E-06	0.002	1.14E-06	1.60E-04	5.72E-08	1.14E-06	1.14E-06	1.14E-06	1.03E-03	1.14E-06
223rd Street, Wilmington to Alameda	0.064	1.92E-05	7.04E-05	5.18E-04	1.28E-05	1.08E-03	2.56E-05	1.28E-05	0.015	7.29E-06	1.02E-03	3.64E-07	7.29E-06	7.29E-06	7.29E-06	6.56E-03	7.29E-06
W Wardlow from Alameda to I-710	0.041	1.23E-05	4.50E-05	3.31E-04	8.18E-06	6.91E-04	1.64E-05	8.18E-06	0.009	4.66E-06	6.53E-04	2.33E-07	4.66E-06	4.66E-06	4.66E-06	4.20E-03	4.66E-06

Table B-12
2030 Alternative 2
Maximum Hourly Truck Emissions

	Port Trucks - Diesel Exhaust (LNG & Diesel Trucks)												
	TOG	1,3-Butadiene	Acetaldehyde	Benzene	Ethylbenzene	formaldehyde	n-Hexane	Methanol	MEK	Propylene	Sthrene	Toluene	Xylene
		106990	75070	71432	100414	50000	110543	67561	78933	115071	100425	108883	1330207
2030 Alternative 2	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	7.61E-01	1.45E-03	5.59E-02	1.52E-02	2.32E-03	1.12E-01	1.19E-03	2.28E-04	1.12E-02	1.98E-02	4.41E-04	1.12E-02	7.92E-03
Henry Ford Ramps	1.43E-01	2.71E-04	1.05E-02	2.86E-03	4.36E-04	2.10E-02	2.24E-04	4.28E-05	2.11E-03	3.71E-03	8.28E-05	2.10E-03	1.49E-03
Henry Ford n/o Ramps to Alameda	7.23E-01	1.37E-03	5.32E-02	1.45E-02	2.21E-03	1.06E-01	1.14E-03	2.17E-04	1.07E-02	1.88E-02	4.19E-04	1.07E-02	7.53E-03
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.15E+00	2.18E-03	8.42E-02	2.29E-02	3.49E-03	1.69E-01	1.80E-03	3.44E-04	1.69E-02	2.97E-02	6.64E-04	1.69E-02	1.19E-02
SR-103 Anaheim to PCH	6.79E-01	1.29E-03	4.99E-02	1.36E-02	2.07E-03	9.99E-02	1.07E-03	2.04E-04	1.00E-02	1.76E-02	3.94E-04	1.00E-02	7.07E-03
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	4.59E-01	8.71E-04	3.37E-02	9.18E-03	1.40E-03	6.75E-02	7.20E-04	1.38E-04	6.77E-03	1.19E-02	2.66E-04	6.75E-03	4.77E-03
SR-103 Ramps south of Sepulveda/Willow													
NB Sepulveda Ramp (G2 Line)	4.98E-02	9.46E-05	3.66E-03	9.96E-04	1.52E-04	7.33E-03	7.82E-05	1.49E-05	7.35E-04	1.29E-03	2.89E-05	7.33E-04	5.18E-04
SB Sepulveda Ramp (F2 Ramp)	3.50E-02	6.66E-05	2.58E-03	7.01E-04	1.07E-04	5.16E-03	5.50E-05	1.05E-05	5.18E-04	9.10E-04	2.03E-05	5.16E-04	3.65E-04
SR-103 Existing, End Ramps to Sepulveda/Willow													
SB Sepulveda Ramp Traffic	6.45E-03	1.23E-05	4.75E-04	1.29E-04	1.97E-05	9.50E-04	1.01E-05	1.94E-06	9.53E-05	1.68E-04	3.74E-06	9.51E-05	6.72E-05
SB+NB Sepulveda Ramp Traffic	2.54E-02	4.82E-05	1.86E-03	5.07E-04	7.73E-05	3.73E-03	3.98E-05	7.61E-06	3.75E-04	6.59E-04	1.47E-05	3.73E-04	2.64E-04
SR-103, Realignment to End (223rd/Wardlow)	1.30E+00	2.47E-03	9.56E-02	2.60E-02	3.97E-03	1.91E-01	2.04E-03	3.90E-04	1.92E-02	3.38E-02	7.54E-04	1.92E-02	1.35E-02
E and W Harry Bridges, Figueroa to start Alameda	3.92E-01	7.44E-04	2.88E-02	7.84E-03	1.19E-03	5.76E-02	6.15E-04	1.18E-04	5.79E-03	1.02E-02	2.27E-04	5.77E-03	4.08E-03
Alameda beginning (E Harry Bridges) to Anaheim	2.28E-01	4.33E-04	1.68E-02	4.56E-03	6.96E-04	3.36E-02	3.58E-04	6.84E-05	3.37E-03	5.92E-03	1.32E-04	3.36E-03	2.37E-03
Alameda Anaheim to Henry Ford	8.04E-02	1.53E-04	5.91E-03	1.61E-03	2.45E-04	1.18E-02	1.26E-04	2.41E-05	1.19E-03	2.09E-03	4.66E-05	1.18E-03	8.37E-04
Alameda, Henry Ford to PCH	1.77E-01	3.36E-04	1.30E-02	3.54E-03	5.40E-04	2.60E-02	2.78E-04	5.31E-05	2.61E-03	4.59E-03	1.03E-04	2.61E-03	1.84E-03
Alameda PCH to 405	8.16E-01	1.55E-03	6.00E-02	1.63E-02	2.49E-03	1.20E-01	1.28E-03	2.45E-04	1.21E-02	2.12E-02	4.73E-04	1.20E-02	8.50E-03
Alameda 405 to del Amo	1.48E+00	2.82E-03	1.09E-01	2.97E-02	4.52E-03	2.18E-01	2.33E-03	4.45E-04	2.19E-02	3.85E-02	8.60E-04	2.18E-02	1.54E-02
Alameda, del Amo to South Santa Fe Avenue	5.07E-01	9.63E-04	3.73E-02	1.01E-02	1.55E-03	7.46E-02	7.96E-04	1.52E-04	7.48E-03	1.32E-02	2.94E-04	7.46E-03	5.27E-03
Alameda, South Santa Fe Avenue to SR-91	5.35E-01	1.02E-03	3.93E-02	1.07E-02	1.63E-03	7.86E-02	8.39E-04	1.60E-04	7.89E-03	1.39E-02	3.10E-04	7.87E-03	5.56E-03
I-110, "C" Street Interchange to Anaheim	3.42E-01	6.51E-04	2.52E-02	6.85E-03	1.04E-03	5.04E-02	5.38E-04	1.03E-04	5.06E-03	8.89E-03	1.99E-04	5.04E-03	3.57E-03
I-110, Anaheim to PCH	4.93E-01	9.36E-04	3.62E-02	9.86E-03	1.50E-03	7.25E-02	7.74E-04	1.48E-04	7.28E-03	1.28E-02	2.86E-04	7.26E-03	5.13E-03
1-110, PCH to Sepulveda	8.51E-01	1.62E-03	6.26E-02	1.70E-02	2.60E-03	1.25E-01	1.34E-03	2.55E-04	1.26E-02	2.21E-02	4.94E-04	1.25E-02	8.86E-03
I-110, Sepulveda to Carson	8.98E-01	1.71E-03	6.61E-02	1.80E-02	2.74E-03	1.32E-01	1.41E-03	2.70E-04	1.33E-02	2.33E-02	5.21E-04	1.32E-02	9.35E-03
I-110, Carson to Del Amo	5.63E-01	1.07E-03	4.14E-02	1.13E-02	1.72E-03	8.29E-02	8.84E-04	1.69E-04	8.32E-03	1.46E-02	3.27E-04	8.30E-03	5.86E-03
I-110, Del Amo to 405	3.95E-01	7.50E-04	2.90E-02	7.90E-03	1.20E-03	5.81E-02	6.20E-04	1.18E-04	5.83E-03	1.03E-02	2.29E-04	5.82E-03	4.11E-03
I-110, 405 to SR-91	5.29E-01	1.01E-03	3.89E-02	1.06E-02	1.61E-03	7.79E-02	8.31E-04	1.59E-04	7.82E-03	1.37E-02	3.07E-04	7.80E-03	5.51E-03
I-710, Anaheim to PCH	8.67E-01	1.65E-03	6.37E-02	1.73E-02	2.64E-03	1.28E-01	1.36E-03	2.60E-04	1.28E-02	2.25E-02	5.03E-04	1.28E-02	9.02E-03
I-710, PCH to Willow	1.75E+00	3.32E-03	1.29E-01	3.50E-02	5.33E-03	2.57E-01	2.74E-03	5.24E-04	2.58E-02	4.54E-02	1.01E-03	2.57E-02	1.82E-02
I-710, Willow to 405	2.64E+00	5.01E-03	1.94E-01	5.27E-02	8.04E-03	3.88E-01	4.14E-03	7.91E-04	3.89E-02	6.85E-02	1.53E-03	3.88E-02	2.74E-02
I-710, 405 to Del Amo	2.31E+00	4.40E-03	1.70E-01	4.63E-02	7.06E-03	3.41E-01	3.63E-03	6.94E-04	3.42E-02	6.01E-02	1.34E-03	3.41E-02	2.41E-02
I-710, Del Amo to Long Beach Blvd Interchange	1.88E+00	3.56E-03	1.38E-01	3.75E-02	5.72E-03	2.76E-01	2.94E-03	5.63E-04	2.77E-02	4.87E-02	1.09E-03	2.76E-02	1.95E-02
I-710, Long Beach Boulevard to SR-91	1.52E+00	2.90E-03	1.12E-01	3.05E-02	4.65E-03	2.24E-01	2.39E-03	4.57E-04	2.25E-02	3.96E-02	8.84E-04	2.25E-02	1.59E-02
PCH, I-110 to Alameda	3.88E-01	7.37E-04	2.85E-02	7.76E-03	1.18E-03	5.71E-02	6.09E-04	1.16E-04	5.73E-03	1.01E-02	2.25E-04	5.71E-03	4.04E-03
PCH, Alameda to SR-103	6.55E-02	1.24E-04	4.82E-03	1.31E-03	2.00E-04	9.64E-03	1.03E-04	1.96E-05	9.67E-04	1.70E-03	3.80E-05	9.65E-04	6.82E-04
PCH, SR-103 to I-710	4.96E-01	9.42E-04	3.65E-02	9.92E-03	1.51E-03	7.30E-02	7.79E-04	1.49E-04	7.32E-03	1.29E-02	2.88E-04	7.30E-03	5.16E-03
Sepulveda, I-110 to Avalon	4.80E-02	9.13E-05	3.53E-03	9.61E-04	1.47E-04	7.07E-03	7.54E-05	1.44E-05	7.10E-04	1.25E-03	2.79E-05	7.08E-04	5.00E-04
Sepulveda, Avalon to Alameda	1.29E-01	2.45E-04	9.50E-03	2.58E-03	3.94E-04	1.90E-02	2.03E-04	3.87E-05	1.91E-03	3.35E-03	7.49E-05	1.90E-03	1.34E-03
Sepulveda, Alameda to ICTF	7.08E-02	1.34E-04	5.21E-03	1.42E-03	2.16E-04	1.04E-02	1.11E-04	2.12E-05	1.05E-03	1.84E-03	4.11E-05	1.04E-03	7.37E-04
Sepulveda, ICTF to SR-103	7.81E-02	1.48E-04	5.74E-03	1.56E-03	2.38E-04	1.15E-02	1.23E-04	2.34E-05	1.15E-03	2.03E-03	4.53E-05	1.15E-03	8.13E-04
Del Amo, I-110 to Wilmington	1.07E-01	2.03E-04	7.85E-03	2.14E-03	3.26E-04	1.57E-02	1.68E-04	3.20E-05	1.58E-03	2.77E-03	6.20E-05	1.57E-03	1.11E-03
Del Amo, Wilminton to Alameda	4.08E-02	7.75E-05	3.00E-03	8.16E-04	1.24E-04	6.00E-03	6.40E-05	1.22E-05	6.02E-04	1.06E-03	2.36E-05	6.01E-04	4.24E-04
Del Amo, Alameda to I-710	6.53E-02	1.24E-04	4.80E-03	1.31E-03	1.99E-04	9.60E-03	1.02E-04	1.96E-05	9.64E-04	1.70E-03	3.79E-05	9.61E-04	6.80E-04
223rd Street, I-110 to Avalon	1.42E-02	2.69E-05	1.04E-03	2.83E-04	4.32E-05	2.08E-03	2.22E-05	4.25E-06	2.09E-04	3.68E-04	8.21E-06	2.09E-04	1.47E-04
223rd Street, Avalon to Wilmington	2.53E-02	4.81E-05	1.86E-03	5.07E-04	7.72E-05	3.72E-03	3.97E-05	7.59E-06	3.74E-04	6.57E-04	1.47E-05	3.73E-04	2.64E-04
223rd Street, Wilmington to Alameda	8.70E-02	1.65E-04	6.39E-03	1.74E-03	2.65E-04	1.28E-02	1.37E-04	2.61E-05	1.28E-03	2.26E-03	5.04E-05	1.28E-03	9.05E-04
W Wardlow from Alameda to I-710	2.68E-01	5.09E-04	1.97E-02	5.36E-03	8.18E-04	3.94E-02	4.21E-04	8.04E-05	3.96E-03	6.96E-03	1.55E-04	3.95E-03	2.79E-03

Table B-12
2030 Alternative 2
Maximum Hourly Truck Emissions

	Port Trucks - Diesel Exhaust (LNG & Diesel Trucks)																	
	DPM	Ammonia	Antimony	Arsenic	Bromine	Bromine	Cadmium	Chlorine	Chromium	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Sulfates	Vanadium	Zinc
		7664417	7440360	7440382	7726956	7726956	7440439	7782505	18540299	7440508	7439921	7439965	7439976	7440020	7782492	9960	7440622	7440666
2030 Alternative 2	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	2.46E-01	8.30E-04	8.87E-06	1.23E-06	4.43E-06	4.43E-06	9.85E-06	8.47E-05	1.48E-07	6.16E-06	1.03E-05	9.85E-06	7.39E-06	4.68E-06	2.46E-06	4.29E-03	7.14E-06	1.08E-04
Henry Ford Ramps	1.00E-02	3.37E-05	3.60E-07	5.00E-08	1.80E-07	1.80E-07	4.00E-07	3.44E-06	6.00E-09	2.50E-07	4.20E-07	4.00E-07	3.00E-07	1.90E-07	1.00E-07	1.74E-04	2.90E-07	4.38E-06
Henry Ford n/o Ramps to Alameda	5.03E-02	1.70E-04	1.81E-06	2.52E-07	9.06E-07	9.06E-07	2.01E-06	1.73E-05	3.02E-08	1.26E-06	2.11E-06	2.01E-06	1.51E-06	9.56E-07	5.03E-07	8.76E-04	1.46E-06	2.20E-05
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	2.96E-01	9.96E-04	1.06E-05	1.48E-06	5.32E-06	5.32E-06	1.18E-05	1.02E-04	1.77E-07	7.39E-06	1.24E-05	1.18E-05	8.87E-06	5.62E-06	2.96E-06	5.14E-03	8.57E-06	1.29E-04
SR-103 Anaheim to PCH	1.75E-01	5.90E-04	6.31E-06	8.76E-07	3.15E-06	3.15E-06	7.01E-06	6.03E-05	1.05E-07	4.38E-06	7.36E-06	7.01E-06	5.26E-06	3.33E-06	1.75E-06	3.05E-03	5.08E-06	7.67E-05
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	1.18E-01	3.99E-04	4.26E-06	5.92E-07	2.13E-06	2.13E-06	4.73E-06	4.07E-05	7.10E-08	2.96E-06	4.97E-06	4.73E-06	3.55E-06	2.25E-06	1.18E-06	2.06E-03	3.43E-06	5.18E-05
SR-103 Ramps south of Sepulveda/Willow	0.00E+00																	
NB Sepulveda Ramp (G2 Line)	2.00E-02	6.72E-05	7.18E-07	9.98E-08	3.59E-07	3.59E-07	7.98E-07	6.87E-06	1.20E-08	4.99E-07	8.38E-07	7.98E-07	5.99E-07	3.79E-07	2.00E-07	3.47E-04	5.79E-07	8.74E-06
SB Sepulveda Ramp (F2 Ramp)	1.40E-02	4.73E-05	5.06E-07	7.02E-08	2.53E-07	2.53E-07	5.62E-07	4.83E-06	8.43E-09	3.51E-07	5.90E-07	5.62E-07	4.21E-07	2.67E-07	1.40E-07	2.44E-04	4.07E-07	6.15E-06
SR-103 Existing, End Ramps to Sepulveda/Willow	0.00E+00																	
SB Sepulveda Ramp Traffic	2.59E-03	8.72E-06	9.31E-08	1.29E-08	4.66E-08	4.66E-08	1.03E-07	8.90E-07	1.55E-09	6.47E-08	1.09E-07	1.03E-07	7.76E-08	4.92E-08	2.59E-08	4.50E-05	7.50E-08	1.13E-06
SB+NB Sepulveda Ramp Traffic	1.02E-02	3.42E-05	3.66E-07	5.08E-08	1.83E-07	1.83E-07	4.07E-07	3.50E-06	6.10E-09	2.54E-07	4.27E-07	4.07E-07	3.05E-07	1.93E-07	1.02E-07	1.77E-04	2.95E-07	4.45E-06
SR-103, Realignment to End (223rd/Wardlow)	3.35E-01	1.13E-03	1.21E-05	1.68E-06	6.04E-06	6.04E-06	1.34E-05	1.15E-04	2.01E-07	8.38E-06	1.41E-05	1.34E-05	1.01E-05	6.37E-06	3.35E-06	5.83E-03	9.72E-06	1.47E-04
E and W Harry Bridges, Figueroa to start Alameda	5.58E-02	1.88E-04	2.01E-06	2.79E-07	1.00E-06	1.00E-06	2.23E-06	1.92E-05	3.35E-08	1.39E-06	2.34E-06	2.23E-06	1.67E-06	1.06E-06	5.58E-07	9.71E-04	1.62E-06	2.44E-05
Alameda beginning (E Harry Bridges) to Anaheim	3.25E-02	1.10E-04	1.17E-06	1.63E-07	5.85E-07	5.85E-07	1.30E-06	1.12E-05	1.95E-08	8.13E-07	1.37E-06	1.30E-06	9.75E-07	6.18E-07	3.25E-07	5.66E-04	9.43E-07	1.42E-05
Alameda Anaheim to Henry Ford	1.15E-02	3.87E-05	4.13E-07	5.74E-08	2.07E-07	2.07E-07	4.59E-07	3.95E-06	6.89E-09	2.87E-07	4.82E-07	4.59E-07	3.44E-07	2.18E-07	1.15E-07	2.00E-04	3.33E-07	5.03E-06
Alameda, Henry Ford to PCH	2.50E-02	8.43E-05	9.01E-07	1.25E-07	4.50E-07	4.50E-07	1.00E-06	8.61E-06	1.50E-08	6.26E-07	1.05E-06	1.00E-06	7.51E-07	4.75E-07	2.50E-07	4.35E-04	7.26E-07	1.10E-05
Alameda PCH to 405	1.69E-01	5.70E-04	6.09E-06	8.46E-07	3.04E-06	3.04E-06	6.76E-06	5.82E-05	1.01E-07	4.23E-06	7.10E-06	6.76E-06	5.07E-06	3.21E-06	1.69E-06	2.94E-03	4.90E-06	7.41E-05
Alameda 405 to del Amo	2.49E-01	8.38E-04	8.96E-06	1.24E-06	4.48E-06	4.48E-06	9.95E-06	8.56E-05	1.49E-07	6.22E-06	1.05E-05	9.95E-06	7.47E-06	4.73E-06	2.49E-06	4.33E-03	7.22E-06	1.09E-04
Alameda, del Amo to South Santa Fe Avenue	8.58E-02	2.89E-04	3.09E-06	4.29E-07	1.55E-06	1.55E-06	3.43E-06	2.95E-05	5.15E-08	2.15E-06	3.61E-06	3.43E-06	2.58E-06	1.63E-06	8.58E-07	1.49E-03	2.49E-06	3.76E-05
Alameda, South Santa Fe Avenue to SR-91	8.99E-02	3.03E-04	3.23E-06	4.49E-07	1.62E-06	1.62E-06	3.59E-06	3.09E-05	5.39E-08	2.25E-06	3.77E-06	3.59E-06	2.70E-06	1.71E-06	8.99E-07	1.56E-03	2.61E-06	3.94E-05
I-110, "C" Street Interchange to Anaheim	8.85E-02	2.98E-04	3.19E-06	4.43E-07	1.59E-06	1.59E-06	3.54E-06	3.05E-05	5.31E-08	2.21E-06	3.72E-06	3.54E-06	2.66E-06	1.68E-06	8.85E-07	1.54E-03	2.57E-06	3.88E-05
I-110, Anaheim to PCH	1.27E-01	4.28E-04	4.57E-06	6.35E-07	2.29E-06	2.29E-06	5.08E-06	4.37E-05	7.62E-08	3.18E-06	5.34E-06	5.08E-06	3.81E-06	2.41E-06	1.27E-06	2.21E-03	3.68E-06	5.56E-05
1-110, PCH to Sepulveda	2.19E-01	7.39E-04	7.90E-06	1.10E-06	3.95E-06	3.95E-06	8.78E-06	7.55E-05	1.32E-07	5.49E-06	9.22E-06	8.78E-06	6.58E-06	4.17E-06	2.19E-06	3.82E-03	6.36E-06	9.61E-05
I-110, Sepulveda to Carson	2.32E-01	7.80E-04	8.34E-06	1.16E-06	4.17E-06	4.17E-06	9.26E-06	7.97E-05	1.39E-07	5.79E-06	9.73E-06	9.26E-06	6.95E-06	4.40E-06	2.32E-06	4.03E-03	6.72E-06	1.01E-04
I-110, Carson to Del Amo	1.45E-01	4.89E-04	5.23E-06	7.26E-07	2.61E-06	2.61E-06	5.81E-06	4.99E-05	8.71E-08	3.63E-06	6.10E-06	5.81E-06	4.36E-06	2.76E-06	1.45E-06	2.53E-03	4.21E-06	6.36E-05
I-110, Del Amo to 405	1.02E-01	3.43E-04	3.66E-06	5.09E-07	1.83E-06	1.83E-06	4.07E-06	3.50E-05	6.11E-08	2.54E-06	4.27E-06	4.07E-06	3.05E-06	1.93E-06	1.02E-06	1.77E-03	2.95E-06	4.46E-05
I-110, 405 to SR-91	1.37E-01	4.60E-04	4.91E-06	6.83E-07	2.46E-06	2.46E-06	5.46E-06	4.70E-05	8.19E-08	3.41E-06	5.73E-06	5.46E-06	4.10E-06	2.59E-06	1.37E-06	2.38E-03	3.96E-06	5.98E-05
I-710, Anaheim to PCH	1.80E-01	6.05E-04	6.46E-06	8.98E-07	3.23E-06	3.23E-06	7.18E-06	6.18E-05	1.08E-07	4.49E-06	7.54E-06	7.18E-06	5.39E-06	3.41E-06	1.80E-06	3.12E-03	5.21E-06	7.86E-05
I-710, PCH to Willow	3.62E-01	1.22E-03	1.30E-05	1.81E-06	6.52E-06	6.52E-06	1.45E-05	1.25E-04	2.17E-07	9.05E-06	1.52E-05	1.45E-05	1.09E-05	6.88E-06	3.62E-06	6.30E-03	1.05E-05	1.59E-04
I-710, Willow to 405	5.46E-01	1.84E-03	1.97E-05	2.73E-06	9.83E-06	9.83E-06	2.18E-05	1.88E-04	3.28E-07	1.37E-05	2.29E-05	2.18E-05	1.64E-05	1.04E-05	5.46E-06	9.50E-03	1.58E-05	2.39E-04
I-710, 405 to Del Amo	4.80E-01	1.62E-03	1.73E-05	2.40E-06	8.63E-06	8.63E-06	1.92E-05	1.65E-04	2.88E-07	1.20E-05	2.01E-05	1.92E-05	1.44E-05	9.11E-06	4.80E-06	8.35E-03	1.39E-05	2.10E-04
I-710, Del Amo to Long Beach Blvd Interchange	3.89E-01	1.31E-03	1.40E-05	1.94E-06	7.00E-06	7.00E-06	1.55E-05	1.34E-04	2.33E-07	9.72E-06	1.63E-05	1.55E-05	1.17E-05	7.38E-06	3.89E-06	6.76E-03	1.13E-05	1.70E-04
I-710, Long Beach Boulevard to SR-91	3.16E-01	1.06E-03	1.14E-05	1.58E-06	5.69E-06	5.69E-06	1.26E-05	1.09E-04	1.90E-07	7.90E-06	1.33E-05	1.26E-05	9.48E-06	6.00E-06	3.16E-06	5.50E-03	9.16E-06	1.38E-04
PCH, I-110 to Alameda	4.27E-02	1.44E-04	1.54E-06	2.14E-07	7.69E-07	7.69E-07	1.71E-06	1.47E-05	2.56E-08	1.07E-06	1.79E-06	1.71E-06	1.28E-06	8.11E-07	4.27E-07	7.43E-04	1.24E-06	1.87E-05
PCH, Alameda to SR-103	7.12E-03	2.40E-05	2.56E-07	3.56E-08	1.28E-07	1.28E-07	2.85E-07	2.45E-06	4.27E-09	1.78E-07	2.99E-07	2.85E-07	2.14E-07	1.35E-07	7.12E-08	1.24E-04	2.07E-07	3.12E-06
PCH, SR-103 to I-710	5.45E-02	1.84E-04	1.96E-06	2.73E-07	9.81E-07	9.81E-07	2.18E-06	1.88E-05	3.27E-08	1.36E-06	2.29E-06	2.18E-06	1.64E-06	1.04E-06	5.45E-07	9.49E-04	1.58E-06	2.39E-05
Sepulveda, I-110 to Avalon	5.85E-03	1.97E-05	2.10E-07	2.92E-08	1.05E-07	1.05E-07	2.34E-07	2.01E-06	3.51E-09	1.46E-07	2.45E-07	2.34E-07	1.75E-07	1.11E-07	5.85E-08	1.02E-04	1.70E-07	2.56E-06
Sepulveda, Avalon to Alameda	1.55E-02	5.24E-05	5.60E-07	7.77E-08	2.80E-07	2.80E-07	6.22E-07	5.35E-06	9.33E-09	3.89E-07	6.53E-07	6.22E-07	4.66E-07	2.95E-07	1.55E-07	2.70E-04	4.51E-07	6.81E-06
Sepulveda, Alameda to ICTF	8.62E-03	2.90E-05	3.10E-07	4.31E-08	1.55E-07	1.55E-07	3.45E-07	2.96E-06	5.17E-09	2.15E-07	3.62E-07	3.45E-07	2.58E-07	1.64E-07	8.62E-08	1.50E-04	2.50E-07	3.77E-06
Sepulveda, ICTF to SR-103	9.46E-03	3.19E-05	3.41E-07	4.73E-08	1.70E-07	1.70E-07	3.78E-07	3.25E-06	5.68E-09	2.36E-07	3.97E-07	3.78E-07	2.84E-07	1.80E-07	9.46E-08	1.65E-04	2.74E-07	4.14E-06
Del Amo, I-110 to Wilmington	1.29E-02	4.34E-05	4.64E-07	6.44E-08	2.32E-07	2.32E-07	5.15E-07	4.43E-06	7.73E-09	3.22E-07	5.41E-07	5.15E-07	3.87E-07	2.45E-07	1.29E-07	2.24E-04	3.74E-07	5.64E-06
Del Amo, Wilminton to Alameda	5.06E-03	1.70E-05	1.82E-07	2.53E-08	9.11E-08	9.11E-08	2.02E-07	1.74E-06	3.04E-09	1.26E-07	2.13E-07	2.02E-07	1.52E-07	9.61E-08	5.06E-08	8.80E-05	1.47E-07	2.22E-06
Del Amo, Alameda to I-710	7.93E-03	2.67E-05	2.86E-07	3.97E-08	1.43E-07	1.43E-07	3.17E-07	2.73E-06	4.76E-09	1.98E-07	3.33E-07	3.17E-07	2.38E-07	1.51E-07	7.93E-08	1.38E-04	2.30E-07	3.48E-06
223rd Street, I-110 to Avalon	1.73E-03	5.82E-06	6.22E-08	8.64E-09	3.11E-08	3.11E-08	6.92E-08	5.95E-07	1.04E-09	4.32E-08	7.26E-08	6.92E-08	5.19E-08	3.28E-08	1.73E-08	3.01E-05	5.01E-08	7.57E-07
223rd Street, Avalon to Wilmington	3.08E-03	1.04E-05	1.11E-07	1.54E-08	5.54E-08	5.54E-08	1.23E-07	1.06E-06	1.85E-09	7.69E-08	1.29E-07	1.23E-07	9.23E-08	5.85E-08	3.08E-08	5.35E-05	8.92E-08	1.35E-06
223rd Street, Wilmington to Alameda	1.07E-02	3.62E-05	3.87E-07	5.37E-08	1.93E-07	1.93E-07	4.30E-07	3.69E-06	6.44E-09	2.68E-07	4.51E-07	4.30E-07	3.22E-07	2.04E-07	1.07E-07	1.87E-04	3.11E-07	4.70E-06
W Wardlow from Alameda to I-710	3.22E-02	1.09E-04	1.16E-06	1.61E-07	5.80E-07	5.80E-07	1.29E-06	1.11E-05	1.93E-08	8.05E-07	1.35E-06	1.29E-06	9.66E-07	6.12E-07	3.22E-07	5.60E-04	9.34E-07	1.41E-05

Table B-12
2030 Alternative 2
Maximum Hourly Truck Emissions

	SCAG Gasoline Truck Emissions					
	TOG	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
		71432	50000	106990	75070	107028
2030 Alternative 2	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	1.31E-04	2.76E-06	1.78E-06	6.10E-07	3.21E-07	1.48E-07
Henry Ford Ramps	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Henry Ford n/o Ramps to Alameda	1.89E-03	3.98E-05	2.57E-05	8.79E-06	4.62E-06	2.13E-06
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	2.00E-04	4.21E-06	2.72E-06	9.31E-07	4.90E-07	2.26E-07
SR-103 Anaheim to PCH	6.10E-04	1.29E-05	8.30E-06	2.84E-06	1.50E-06	6.90E-07
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	8.65E-04	1.82E-05	1.18E-05	4.03E-06	2.12E-06	9.77E-07
SR-103 Ramps south of Sepulveda/Willow						
NB Sepulveda Ramp (G2 Line)	2.02E-04	4.27E-06	2.75E-06	9.43E-07	4.96E-07	2.29E-07
SB Sepulveda Ramp (F2 Ramp)	1.42E-04	3.00E-06	1.94E-06	6.64E-07	3.49E-07	1.61E-07
SR-103 Existing, End Ramps to Sepulveda/Willow						
SB Sepulveda Ramp Traffic	2.62E-05	5.53E-07	3.57E-07	1.22E-07	6.43E-08	2.96E-08
SB+NB Sepulveda Ramp Traffic	1.03E-04	2.17E-06	1.40E-06	4.80E-07	2.53E-07	1.16E-07
SR-103, Realignment to End (223rd/Wardlow)	1.42E-03	3.00E-05	1.93E-05	6.63E-06	3.49E-06	1.61E-06
E and W Harry Bridges, Figueroa to start Alameda	1.92E-03	4.04E-05	2.61E-05	8.93E-06	4.69E-06	2.16E-06
Alameda beginning (E Harry Bridges) to Anaheim	1.94E-03	4.08E-05	2.64E-05	9.03E-06	4.75E-06	2.19E-06
Alameda Anaheim to Henry Ford	1.24E-03	2.60E-05	1.68E-05	5.76E-06	3.03E-06	1.40E-06
Alameda, Henry Ford to PCH	1.01E-03	2.12E-05	1.37E-05	4.69E-06	2.47E-06	1.14E-06
Alameda PCH to 405	1.49E-02	3.14E-04	2.03E-04	6.95E-05	3.65E-05	1.69E-05
Alameda 405 to del Amo	1.30E-02	2.75E-04	1.77E-04	6.08E-05	3.20E-05	1.47E-05
Alameda, del Amo to South Santa Fe Avenue	5.73E-03	1.21E-04	7.79E-05	2.67E-05	1.40E-05	6.47E-06
Alameda, South Santa Fe Avenue to SR-91	5.36E-03	1.13E-04	7.29E-05	2.50E-05	1.31E-05	6.06E-06
I-110, "C" Street Interchange to Anaheim	4.40E-03	9.28E-05	5.99E-05	2.05E-05	1.08E-05	4.98E-06
I-110, Anaheim to PCH	7.92E-03	1.67E-04	1.08E-04	3.69E-05	1.94E-05	8.95E-06
1-110, PCH to Sepulveda	1.76E-02	3.72E-04	2.40E-04	8.21E-05	4.32E-05	1.99E-05
I-110, Sepulveda to Carson	2.77E-02	5.84E-04	3.77E-04	1.29E-04	6.79E-05	3.13E-05
I-110, Carson to Del Amo	1.94E-02	4.08E-04	2.63E-04	9.02E-05	4.74E-05	2.19E-05
I-110, Del Amo to 405	1.75E-02	3.69E-04	2.38E-04	8.15E-05	4.29E-05	1.98E-05
I-110, 405 to SR-91	3.80E-02	8.01E-04	5.17E-04	1.77E-04	9.31E-05	4.29E-05
I-710, Anaheim to PCH	3.84E-03	8.10E-05	5.23E-05	1.79E-05	9.41E-06	4.34E-06
I-710, PCH to Willow	8.57E-03	1.81E-04	1.17E-04	3.99E-05	2.10E-05	9.69E-06
I-710, Willow to 405	1.37E-02	2.89E-04	1.86E-04	6.38E-05	3.35E-05	1.55E-05
I-710, 405 to Del Amo	2.30E-02	4.84E-04	3.13E-04	1.07E-04	5.63E-05	2.60E-05
I-710, Del Amo to Long Beach Blvd Interchange	2.02E-02	4.26E-04	2.75E-04	9.41E-05	4.95E-05	2.28E-05
I-710, Long Beach Boulevard to SR-91	2.67E-02	5.63E-04	3.63E-04	1.24E-04	6.54E-05	3.02E-05
PCH, I-110 to Alameda	3.02E-02	6.37E-04	4.11E-04	1.41E-04	7.41E-05	3.42E-05
PCH, Alameda to SR-103	6.84E-03	1.44E-04	9.30E-05	3.19E-05	1.68E-05	7.73E-06
PCH, SR-103 to I-710	7.36E-03	1.55E-04	1.00E-04	3.43E-05	1.80E-05	8.32E-06
Sepulveda, I-110 to Avalon	7.03E-03	1.48E-04	9.56E-05	3.28E-05	1.72E-05	7.94E-06
Sepulveda, Avalon to Alameda	1.05E-02	2.22E-04	1.43E-04	4.90E-05	2.57E-05	1.19E-05
Sepulveda, Alameda to ICTF	1.89E-03	3.98E-05	2.57E-05	8.80E-06	4.63E-06	2.13E-06
Sepulveda, ICTF to SR-103	4.10E-04	8.64E-06	5.58E-06	1.91E-06	1.00E-06	4.63E-07
Del Amo, I-110 to Wilmington	2.04E-02	4.29E-04	2.77E-04	9.49E-05	4.99E-05	2.30E-05
Del Amo, Wilminton to Alameda	8.35E-03	1.76E-04	1.14E-04	3.89E-05	2.05E-05	9.44E-06
Del Amo, Alameda to I-710	1.00E-02	2.11E-04	1.36E-04	4.67E-05	2.46E-05	1.13E-05
223rd Street, I-110 to Avalon	7.48E-03	1.58E-04	1.02E-04	3.48E-05	1.83E-05	8.45E-06
223rd Street, Avalon to Wilmington	6.65E-03	1.40E-04	9.04E-05	3.10E-05	1.63E-05	7.51E-06
223rd Street, Wilmington to Alameda	7.55E-03	1.59E-04	1.03E-04	3.52E-05	1.85E-05	8.53E-06
W Wardlow from Alameda to I-710	1.36E-02	2.86E-04	1.85E-04	6.33E-05	3.33E-05	1.53E-05

Table B-12
2030 Alternative 2
Maximum Hourly Truck Emissions

	SCAG Diesel Truck Exhaust												
	TOG	1,3-Butadiene	Acetaldehyde	Benzene	Ethylbenzene	formaldehyde	n-Hexane	Methanol	MEK	Propylene	Sthrene	Toluene	Xylene
		106990	75070	71432	100414	50000	110543	67561	78933	115071	100425	108883	1330207
2030 Alternative 2	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	8.66E-04	1.64E-06	6.37E-05	1.73E-05	2.64E-06	1.27E-04	1.36E-06	2.60E-07	1.28E-05	2.25E-05	5.02E-07	1.28E-05	9.01E-06
Henry Ford Ramps	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Henry Ford n/o Ramps to Alameda	9.66E-03	1.84E-05	7.10E-04	1.93E-04	2.95E-05	1.42E-03	1.52E-05	2.90E-06	1.43E-04	2.51E-04	5.60E-06	1.42E-04	1.01E-04
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.33E-03	2.52E-06	9.76E-05	2.66E-05	4.05E-06	1.95E-04	2.08E-06	3.98E-07	1.96E-05	3.45E-05	7.70E-07	1.96E-05	1.38E-05
SR-103 Anaheim to PCH	4.05E-03	7.70E-06	2.98E-04	8.11E-05	1.24E-05	5.97E-04	6.37E-06	1.22E-06	5.99E-05	1.05E-04	2.35E-06	5.97E-05	4.22E-05
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	5.74E-03	1.09E-05	4.22E-04	1.15E-04	1.75E-05	8.45E-04	9.02E-06	1.72E-06	8.48E-05	1.49E-04	3.33E-06	8.46E-05	5.98E-05
SR-103 Ramps south of Sepulveda/Willow													
NB Sepulveda Ramp (G2 Line)	1.31E-03	2.50E-06	9.66E-05	2.63E-05	4.01E-06	1.93E-04	2.06E-06	3.94E-07	1.94E-05	3.41E-05	7.62E-07	1.93E-05	1.37E-05
SB Sepulveda Ramp (F2 Ramp)	9.24E-04	1.76E-06	6.79E-05	1.85E-05	2.82E-06	1.36E-04	1.45E-06	2.77E-07	1.36E-05	2.40E-05	5.36E-07	1.36E-05	9.62E-06
SR-103 Existing, End Ramps to Sepulveda/Willow													
SB Sepulveda Ramp Traffic	1.70E-04	3.23E-07	1.25E-05	3.41E-06	5.19E-07	2.50E-05	2.67E-07	5.11E-08	2.51E-06	4.42E-06	9.87E-08	2.51E-06	1.77E-06
SB+NB Sepulveda Ramp Traffic	6.69E-04	1.27E-06	4.92E-05	1.34E-05	2.04E-06	9.84E-05	1.05E-06	2.01E-07	9.88E-06	1.74E-05	3.88E-07	9.85E-06	6.96E-06
SR-103, Realignment to End (223rd/Wardlow)	9.45E-03	1.80E-05	6.95E-04	1.89E-04	2.88E-05	1.39E-03	1.48E-05	2.83E-06	1.40E-04	2.45E-04	5.48E-06	1.39E-04	9.84E-05
E and W Harry Bridges, Figueroa to start Alameda	1.11E-02	2.11E-05	8.16E-04	2.22E-04	3.38E-05	1.63E-03	1.74E-05	3.33E-06	1.64E-04	2.88E-04	6.44E-06	1.63E-04	1.16E-04
Alameda beginning (E Harry Bridges) to Anaheim	1.12E-02	2.13E-05	8.25E-04	2.25E-04	3.42E-05	1.65E-03	1.76E-05	3.37E-06	1.66E-04	2.92E-04	6.51E-06	1.65E-04	1.17E-04
Alameda Anaheim to Henry Ford	7.16E-03	1.36E-05	5.26E-04	1.43E-04	2.18E-05	1.05E-03	1.12E-05	2.15E-06	1.06E-04	1.86E-04	4.15E-06	1.05E-04	7.45E-05
Alameda, Henry Ford to PCH	5.83E-03	1.11E-05	4.29E-04	1.17E-04	1.78E-05	8.58E-04	9.15E-06	1.75E-06	8.61E-05	1.51E-04	3.38E-06	8.59E-05	6.07E-05
Alameda PCH to 405	9.83E-02	1.87E-04	7.23E-03	1.97E-03	3.00E-04	1.45E-02	1.54E-04	2.95E-05	1.45E-03	2.55E-03	5.70E-05	1.45E-03	1.02E-03
Alameda 405 to del Amo	8.24E-02	1.56E-04	6.06E-03	1.65E-03	2.51E-04	1.21E-02	1.29E-04	2.47E-05	1.22E-03	2.14E-03	4.78E-05	1.21E-03	8.57E-04
Alameda, del Amo to South Santa Fe Avenue	3.61E-02	6.87E-05	2.66E-03	7.23E-04	1.10E-04	5.32E-03	5.68E-05	1.08E-05	5.34E-04	9.39E-04	2.10E-05	5.32E-04	3.76E-04
Alameda, South Santa Fe Avenue to SR-91	3.39E-02	6.43E-05	2.49E-03	6.77E-04	1.03E-04	4.98E-03	5.32E-05	1.02E-05	5.00E-04	8.79E-04	1.96E-05	4.99E-04	3.52E-04
I-110, "C" Street Interchange to Anaheim	2.92E-02	5.56E-05	2.15E-03	5.85E-04	8.92E-05	4.30E-03	4.59E-05	8.77E-06	4.32E-04	7.60E-04	1.70E-05	4.31E-04	3.04E-04
I-110, Anaheim to PCH	5.26E-02	9.99E-05	3.87E-03	1.05E-03	1.60E-04	7.74E-03	8.26E-05	1.58E-05	7.77E-04	1.37E-03	3.05E-05	7.75E-04	5.47E-04
1-110, PCH to Sepulveda	1.17E-01	2.22E-04	8.61E-03	2.34E-03	3.57E-04	1.72E-02	1.84E-04	3.51E-05	1.73E-03	3.04E-03	6.79E-05	1.72E-03	1.22E-03
I-110, Sepulveda to Carson	1.84E-01	3.50E-04	1.35E-02	3.68E-03	5.61E-04	2.71E-02	2.89E-04	5.52E-05	2.72E-03	4.78E-03	1.07E-04	2.71E-03	1.92E-03
I-110, Carson to Del Amo	1.29E-01	2.44E-04	9.45E-03	2.57E-03	3.92E-04	1.89E-02	2.02E-04	3.86E-05	1.90E-03	3.34E-03	7.46E-05	1.89E-03	1.34E-03
I-110, Del Amo to 405	1.16E-01	2.21E-04	8.55E-03	2.33E-03	3.54E-04	1.71E-02	1.82E-04	3.49E-05	1.72E-03	3.02E-03	6.74E-05	1.71E-03	1.21E-03
I-110, 405 to SR-91	2.52E-01	4.79E-04	1.86E-02	5.05E-03	7.70E-04	3.71E-02	3.96E-04	7.57E-05	3.73E-03	6.55E-03	1.46E-04	3.72E-03	2.63E-03
I-710, Anaheim to PCH	2.53E-02	4.81E-05	1.86E-03	5.07E-04	7.72E-05	3.73E-03	3.98E-05	7.60E-06	3.74E-04	6.58E-04	1.47E-05	3.73E-04	2.64E-04
I-710, PCH to Willow	5.65E-02	1.07E-04	4.15E-03	1.13E-03	1.72E-04	8.31E-03	8.87E-05	1.69E-05	8.34E-04	1.47E-03	3.28E-05	8.32E-04	5.88E-04
I-710, Willow to 405	9.02E-02	1.71E-04	6.64E-03	1.81E-03	2.75E-04	1.33E-02	1.42E-04	2.71E-05	1.33E-03	2.34E-03	5.23E-05	1.33E-03	9.39E-04
I-710, 405 to Del Amo	1.51E-01	2.88E-04	1.11E-02	3.03E-03	4.62E-04	2.23E-02	2.38E-04	4.54E-05	2.24E-03	3.93E-03	8.78E-05	2.23E-03	1.58E-03
I-710, Del Amo to Long Beach Blvd Interchange	1.33E-01	2.53E-04	9.79E-03	2.66E-03	4.06E-04	1.96E-02	2.09E-04	3.99E-05	1.97E-03	3.46E-03	7.72E-05	1.96E-03	1.39E-03
I-710, Long Beach Boulevard to SR-91	1.76E-01	3.34E-04	1.29E-02	3.52E-03	5.36E-04	2.59E-02	2.76E-04	5.28E-05	2.60E-03	4.57E-03	1.02E-04	2.59E-03	1.83E-03
PCH, I-110 to Alameda	1.35E-01	2.57E-04	9.94E-03	2.71E-03	4.13E-04	1.99E-02	2.12E-04	4.06E-05	2.00E-03	3.51E-03	7.84E-05	1.99E-03	1.41E-03
PCH, Alameda to SR-103	3.06E-02	5.81E-05	2.25E-03	6.12E-04	9.33E-05	4.50E-03	4.80E-05	9.18E-06	4.52E-04	7.94E-04	1.77E-05	4.51E-04	3.18E-04
PCH, SR-103 to I-710	3.29E-02	6.26E-05	2.42E-03	6.59E-04	1.00E-04	4.85E-03	5.17E-05	9.88E-06	4.86E-04	8.55E-04	1.91E-05	4.85E-04	3.43E-04
Sepulveda, I-110 to Avalon	3.68E-02	6.99E-05	2.71E-03	7.36E-04	1.12E-04	5.41E-03	5.78E-05	1.10E-05	5.43E-04	9.56E-04	2.13E-05	5.42E-04	3.83E-04
Sepulveda, Avalon to Alameda	5.50E-02	1.04E-04	4.04E-03	1.10E-03	1.68E-04	8.09E-03	8.63E-05	1.65E-05	8.12E-04	1.43E-03	3.19E-05	8.10E-04	5.73E-04
Sepulveda, Alameda to ICTF	9.89E-03	1.88E-05	7.27E-04	1.98E-04	3.02E-05	1.45E-03	1.55E-05	2.97E-06	1.46E-04	2.57E-04	5.73E-06	1.46E-04	1.03E-04
Sepulveda, ICTF to SR-103	2.15E-03	4.08E-06	1.58E-04	4.29E-05	6.55E-06	3.16E-04	3.37E-06	6.44E-07	3.17E-05	5.57E-05	1.24E-06	3.16E-05	2.23E-05
Del Amo, I-110 to Wilmington	1.07E-01	2.03E-04	7.84E-03	2.13E-03	3.25E-04	1.57E-02	1.67E-04	3.20E-05	1.57E-03	2.77E-03	6.18E-05	1.57E-03	1.11E-03
Del Amo, Wilminton to Alameda	4.37E-02	8.31E-05	3.21E-03	8.75E-04	1.33E-04	6.43E-03	6.86E-05	1.31E-05	6.46E-04	1.14E-03	2.54E-05	6.44E-04	4.55E-04
Del Amo, Alameda to I-710	5.25E-02	9.97E-05	3.86E-03	1.05E-03	1.60E-04	7.72E-03	8.24E-05	1.57E-05	7.75E-04	1.36E-03	3.04E-05	7.73E-04	5.46E-04
223rd Street, I-110 to Avalon	3.91E-02	7.43E-05	2.88E-03	7.83E-04	1.19E-04	5.76E-03	6.14E-05	1.17E-05	5.78E-04	1.02E-03	2.27E-05	5.76E-04	4.07E-04
223rd Street, Avalon to Wilmington	3.48E-02	6.61E-05	2.56E-03	6.96E-04	1.06E-04	5.12E-03	5.46E-05	1.04E-05	5.14E-04	9.04E-04	2.02E-05	5.13E-04	3.62E-04
223rd Street, Wilmington to Alameda	3.95E-02	7.51E-05	2.91E-03	7.91E-04	1.21E-04	5.82E-03	6.20E-05	1.19E-05	5.84E-04	1.03E-03	2.29E-05	5.82E-04	4.11E-04
W Wardlow from Alameda to I-710	7.11E-02	1.35E-04	5.22E-03	1.42E-03	2.17E-04	1.05E-02	1.12E-04	2.13E-05	1.05E-03	1.85E-03	4.12E-05	1.05E-03	7.40E-04

Table B-12
2030 Alternative 2
Maximum Hourly Truck Emissions

	SCAG Diesel Truck Exhaust Emissions																	
	DPM	Ammonia	Antimony	Arsenic	Bromine	Bromine	Cadmium	Chlorine	Chromium (hex)	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Sulfates	Vanadium	Zinc
		7664417	7440360	7440382	7726956	7726956	7440439	7782505	18540299	7440508	7439921	7439965	7439976	7440020	7782492	9960	7440622	7440666
2030 Alternative 2		lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	3.01E-04	1.01E-06	1.08E-08	1.50E-09	5.41E-09	5.41E-09	1.20E-08	1.03E-07	1.80E-10	7.51E-09	1.26E-08	1.20E-08	9.02E-09	5.71E-09	3.01E-09	5.23E-06	8.72E-09	1.32E-07
Henry Ford Ramps	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Henry Ford n/o Ramps to Alameda	1.23E-03	4.13E-06	4.42E-08	6.13E-09	2.21E-08	2.21E-08	4.91E-08	4.22E-07	7.36E-10	3.07E-08	5.15E-08	4.91E-08	3.68E-08	2.33E-08	1.23E-08	2.13E-05	3.56E-08	5.37E-07
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	3.91E-04	1.32E-06	1.41E-08	1.95E-09	7.03E-09	7.03E-09	1.56E-08	1.34E-07	2.34E-10	9.76E-09	1.64E-08	1.56E-08	1.17E-08	7.42E-09	3.91E-09	6.80E-06	1.13E-08	1.71E-07
SR-103 Anaheim to PCH	1.19E-03	4.02E-06	4.29E-08	5.96E-09	2.15E-08	2.15E-08	4.77E-08	4.10E-07	7.16E-10	2.98E-08	5.01E-08	4.77E-08	3.58E-08	2.27E-08	1.19E-08	2.08E-05	3.46E-08	5.22E-07
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	1.69E-03	5.69E-06	6.08E-08	8.45E-09	3.04E-08	3.04E-08	6.76E-08	5.81E-07	1.01E-09	4.22E-08	7.10E-08	6.76E-08	5.07E-08	3.21E-08	1.69E-08	2.94E-05	4.90E-08	7.40E-07
SR-103 Ramps south of Sepulveda/Willow	0.00E+00																	
NB Sepulveda Ramp (G2 Line)	5.34E-04	1.80E-06	1.92E-08	2.67E-09	9.60E-09	9.60E-09	2.13E-08	1.84E-07	3.20E-10	1.33E-08	2.24E-08	2.13E-08	1.60E-08	1.01E-08	5.34E-09	9.28E-06	1.55E-08	2.34E-07
SB Sepulveda Ramp (F2 Ramp)	3.75E-04	1.26E-06	1.35E-08	1.88E-09	6.76E-09	6.76E-09	1.50E-08	1.29E-07	2.25E-10	9.39E-09	1.58E-08	1.50E-08	1.13E-08	7.13E-09	3.75E-09	6.53E-06	1.09E-08	1.64E-07
SR-103 Existing, End Ramps to Sepulveda/Willow																		
SB Sepulveda Ramp Traffic	6.92E-05	2.33E-07	2.49E-09	3.46E-10	1.24E-09	1.24E-09	2.77E-09	2.38E-08	4.15E-11	1.73E-09	2.90E-09	2.77E-09	2.07E-09	1.31E-09	6.92E-10	1.20E-06	2.01E-09	3.03E-08
SB+NB Sepulveda Ramp Traffic	2.72E-04	9.15E-07	9.78E-09	1.36E-09	4.89E-09	4.89E-09	1.09E-08	9.35E-08	1.63E-10	6.79E-09	1.14E-08	1.09E-08	8.15E-09	5.16E-09	2.72E-09	4.73E-06	7.88E-09	1.19E-07
SR-103, Realignment to End (223rd/Wardlow)	2.78E-03	9.36E-06	1.00E-07	1.39E-08	5.00E-08	5.00E-08	1.11E-07	9.56E-07	1.67E-09	6.95E-08	1.17E-07	1.11E-07	8.34E-08	5.28E-08	2.78E-08	4.84E-05	8.06E-08	1.22E-06
E and W Harry Bridges, Figueroa to start Alameda	2.21E-03	7.43E-06	7.94E-08	1.10E-08	3.97E-08	3.97E-08	8.83E-08	7.59E-07	1.32E-09	5.52E-08	9.27E-08	8.83E-08	6.62E-08	4.19E-08	2.21E-08	3.84E-05	6.40E-08	9.66E-07
Alameda beginning (E Harry Bridges) to Anaheim	2.23E-03	7.52E-06	8.03E-08	1.12E-08	4.02E-08	4.02E-08	8.93E-08	7.68E-07	1.34E-09	5.58E-08	9.37E-08	8.93E-08	6.70E-08	4.24E-08	2.23E-08	3.88E-05	6.47E-08	9.78E-07
Alameda Anaheim to Henry Ford	1.42E-03	4.79E-06	5.12E-08	7.12E-09	2.56E-08	2.56E-08	5.69E-08	4.90E-07	8.54E-10	3.56E-08	5.98E-08	5.69E-08	4.27E-08	2.70E-08	1.42E-08	2.48E-05	4.13E-08	6.23E-07
Alameda, Henry Ford to PCH	1.16E-03	3.91E-06	4.17E-08	5.80E-09	2.09E-08	2.09E-08	4.64E-08	3.99E-07	6.96E-10	2.90E-08	4.87E-08	4.64E-08	3.48E-08	2.20E-08	1.16E-08	2.02E-05	3.36E-08	5.08E-07
Alameda PCH to 405	2.49E-02	8.39E-05	8.96E-07	1.24E-07	4.48E-07	4.48E-07	9.96E-07	8.56E-06	1.49E-08	6.22E-07	1.05E-06	9.96E-07	7.47E-07	4.73E-07	2.49E-07	4.33E-04	7.22E-07	1.09E-05
Alameda 405 to del Amo	1.81E-02	6.11E-05	6.53E-07	9.07E-08	3.27E-07	3.27E-07	7.26E-07	6.24E-06	1.09E-08	4.54E-07	7.62E-07	7.26E-07	5.44E-07	3.45E-07	1.81E-07	3.16E-04	5.26E-07	7.95E-06
Alameda, del Amo to South Santa Fe Avenue	7.96E-03	2.68E-05	2.87E-07	3.98E-08	1.43E-07	1.43E-07	3.19E-07	2.74E-06	4.78E-09	1.99E-07	3.34E-07	3.19E-07	2.39E-07	1.51E-07	7.96E-08	1.39E-04	2.31E-07	3.49E-06
Alameda, South Santa Fe Avenue to SR-91	7.46E-03	2.51E-05	2.69E-07	3.73E-08	1.34E-07	1.34E-07	2.98E-07	2.57E-06	4.48E-09	1.86E-07	3.13E-07	2.98E-07	2.24E-07	1.42E-07	7.46E-08	1.30E-04	2.16E-07	3.27E-06
I-110, "C" Street Interchange to Anaheim	8.60E-03	2.90E-05	3.10E-07	4.30E-08	1.55E-07	1.55E-07	3.44E-07	2.96E-06	5.16E-09	2.15E-07	3.61E-07	3.44E-07	2.58E-07	1.63E-07	8.60E-08	1.50E-04	2.49E-07	3.77E-06
I-110, Anaheim to PCH	1.55E-02	5.21E-05	5.57E-07	7.73E-08	2.78E-07	2.78E-07	6.19E-07	5.32E-06	9.28E-09	3.87E-07	6.50E-07	6.19E-07	4.64E-07	2.94E-07	1.55E-07	2.69E-04	4.49E-07	6.78E-06
1-110, PCH to Sepulveda	3.44E-02	1.16E-04	1.24E-06	1.72E-07	6.20E-07	6.20E-07	1.38E-06	1.18E-05	2.07E-08	8.61E-07	1.45E-06	1.38E-06	1.03E-06	6.54E-07	3.44E-07	5.99E-04	9.99E-07	1.51E-05
I-110, Sepulveda to Carson	5.41E-02	1.82E-04	1.95E-06	2.71E-07	9.75E-07	9.75E-07	2.17E-06	1.86E-05	3.25E-08	1.35E-06	2.27E-06	2.17E-06	1.62E-06	1.03E-06	5.41E-07	9.42E-04	1.57E-06	2.37E-05
I-110, Carson to Del Amo	3.78E-02	1.27E-04	1.36E-06	1.89E-07	6.81E-07	6.81E-07	1.51E-06	1.30E-05	2.27E-08	9.46E-07	1.59E-06	1.51E-06	1.13E-06	7.19E-07	3.78E-07	6.58E-04	1.10E-06	1.66E-05
I-110, Del Amo to 405	3.42E-02	1.15E-04	1.23E-06	1.71E-07	6.15E-07	6.15E-07	1.37E-06	1.18E-05	2.05E-08	8.55E-07	1.44E-06	1.37E-06	1.03E-06	6.50E-07	3.42E-07	5.95E-04	9.91E-07	1.50E-05
I-110, 405 to SR-91	7.42E-02	2.50E-04	2.67E-06	3.71E-07	1.34E-06	1.34E-06	2.97E-06	2.55E-05	4.45E-08	1.86E-06	3.12E-06	2.97E-06	2.23E-06	1.41E-06	7.42E-07	1.29E-03	2.15E-06	3.25E-05
I-710, Anaheim to PCH	6.41E-03	2.16E-05	2.31E-07	3.21E-08	1.15E-07	1.15E-07	2.56E-07	2.21E-06	3.85E-09	1.60E-07	2.69E-07	2.56E-07	1.92E-07	1.22E-07	6.41E-08	1.12E-04	1.86E-07	2.81E-06
I-710, PCH to Willow	1.43E-02	4.82E-05	5.15E-07	7.15E-08	2.57E-07	2.57E-07	5.72E-07	4.92E-06	8.58E-09	3.58E-07	6.01E-07	5.72E-07	4.29E-07	2.72E-07	1.43E-07	2.49E-04	4.15E-07	6.27E-06
I-710, Willow to 405	2.28E-02	7.70E-05	8.23E-07	1.14E-07	4.11E-07	4.11E-07	9.14E-07	7.86E-06	1.37E-08	5.71E-07	9.60E-07	9.14E-07	6.85E-07	4.34E-07	2.28E-07	3.98E-04	6.63E-07	1.00E-05
I-710, 405 to Del Amo	3.83E-02	1.29E-04	1.38E-06	1.92E-07	6.90E-07	6.90E-07	1.53E-06	1.32E-05	2.30E-08	9.59E-07	1.61E-06	1.53E-06	1.15E-06	7.29E-07	3.83E-07	6.67E-04	1.11E-06	1.68E-05
I-710, Del Amo to Long Beach Blvd Interchange	3.37E-02	1.14E-04	1.21E-06	1.69E-07	6.07E-07	6.07E-07	1.35E-06	1.16E-05	2.02E-08	8.43E-07	1.42E-06	1.35E-06	1.01E-06	6.41E-07	3.37E-07	5.87E-04	9.78E-07	1.48E-05
I-710, Long Beach Boulevard to SR-91	4.45E-02	1.50E-04	1.60E-06	2.23E-07	8.02E-07	8.02E-07	1.78E-06	1.53E-05	2.67E-08	1.11E-06	1.87E-06	1.78E-06	1.34E-06	8.46E-07	4.45E-07	7.75E-04	1.29E-06	1.95E-05
PCH, I-110 to Alameda	2.39E-02	8.04E-05	8.59E-07	1.19E-07	4.30E-07	4.30E-07	9.55E-07	8.21E-06	1.43E-08	5.97E-07	1.00E-06	9.55E-07	7.16E-07	4.54E-07	2.39E-07	4.15E-04	6.92E-07	1.05E-05
PCH, Alameda to SR-103	5.40E-03	1.82E-05	1.94E-07	2.70E-08	9.72E-08	9.72E-08	2.16E-07	1.86E-06	3.24E-09	1.35E-07	2.27E-07	2.16E-07	1.62E-07	1.03E-07	5.40E-08	9.39E-05	1.57E-07	2.36E-06
PCH, SR-103 to I-710	5.81E-03	1.96E-05	2.09E-07	2.91E-08	1.05E-07	1.05E-07	2.32E-07	2.00E-06	3.49E-09	1.45E-07	2.44E-07	2.32E-07	1.74E-07	1.10E-07	5.81E-08	1.01E-04	1.69E-07	2.55E-06
Sepulveda, I-110 to Avalon	6.76E-03	2.28E-05	2.43E-07	3.38E-08	1.22E-07	1.22E-07	2.70E-07	2.32E-06	4.05E-09	1.69E-07	2.84E-07	2.70E-07	2.03E-07	1.28E-07	6.76E-08	1.18E-04	1.96E-07	2.96E-06
Sepulveda, Avalon to Alameda	1.01E-02	3.40E-05	3.64E-07	5.05E-08	1.82E-07	1.82E-07	4.04E-07	3.47E-06	6.06E-09	2.52E-07	4.24E-07	4.04E-07	3.03E-07	1.92E-07	1.01E-07	1.76E-04	2.93E-07	4.42E-06
Sepulveda, Alameda to ICTF	1.82E-03	6.12E-06	6.54E-08	9.08E-09	3.27E-08	3.27E-08	7.26E-08	6.24E-07	1.09E-09	4.54E-08	7.62E-08	7.26E-08	5.45E-08	3.45E-08	1.82E-08	3.16E-05	5.26E-08	7.95E-07
Sepulveda, ICTF to SR-103	3.94E-04	1.33E-06	1.42E-08	1.97E-09	7.09E-09	7.09E-09	1.58E-08	1.36E-07	2.36E-10	9.85E-09	1.65E-08	1.58E-08	1.18E-08	7.49E-09	3.94E-09	6.86E-06	1.14E-08	1.73E-07
Del Amo, I-110 to Wilmington	1.96E-02	6.60E-05	7.05E-07	9.79E-08	3.52E-07	3.52E-07	7.83E-07	6.73E-06	1.17E-08	4.89E-07	8.22E-07	7.83E-07	5.87E-07	3.72E-07	1.96E-07	3.41E-04	5.68E-07	8.58E-06
Del Amo, Wilminton to Alameda	8.03E-03	2.70E-05	2.89E-07	4.01E-08	1.44E-07	1.44E-07	3.21E-07	2.76E-06	4.82E-09	2.01E-07	3.37E-07	3.21E-07	2.41E-07	1.53E-07	8.03E-08	1.40E-04	2.33E-07	3.52E-06
Del Amo, Alameda to I-710	9.63E-03	3.25E-05	3.47E-07	4.82E-08	1.73E-07	1.73E-07	3.85E-07	3.31E-06	5.78E-09	2.41E-07	4.05E-07	3.85E-07	2.89E-07	1.83E-07	9.63E-08	1.68E-04	2.79E-07	4.22E-06
223rd Street, I-110 to Avalon	7.18E-03	2.42E-05	2.59E-07	3.59E-08	1.29E-07	1.29E-07	2.87E-07	2.47E-06	4.31E-09	1.80E-07	3.02E-07	2.87E-07	2.16E-07	1.37E-07	7.18E-08	1.25E-04	2.08E-07	3.15E-06
223rd Street, Avalon to Wilmington	6.39E-03	2.15E-05	2.30E-07	3.20E-08	1.15E-07	1.15E-07	2.56E-07	2.20E-06	3.83E-09	1.60E-07	2.68E-07	2.56E-07	1.92E-07	1.21E-07	6.39E-08	1.11E-04	1.85E-07	2.80E-06
223rd Street, Wilmington to Alameda	7.26E-03	2.44E-05	2.61E-07	3.63E-08	1.31E-07	1.31E-07	2.90E-07	2.50E-06	4.35E-09	1.81E-07	3.05E-07	2.90E-07	2.18E-07	1.38E-07	7.26E-08	1.26E-04	2.10E-07	3.18E-06
W Wardlow from Alameda to I-710	1.30E-02	4.40E-05	4.70E-07	6.52E-08	2.35E-07	2.35E-07	5.22E-07	4.49E-06	7.83E-09	3.26E-07	5.48E-07	5.22E-07	3.91E-07	2.48E-07	1.30E-07	2.27E-04	3.78E-07	5.71E-06

Table B-13
2015 No Build
Annual Average Auto Emissions

	Length (mi)	Average Speed mph	Gasoline Autos AADT	ALL Gasoline TOG	ALL Gasoline TOG	AverageToxic Emissions from Autos				
						Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
						71432	50000	106990	75070	107028
Baseline 2015			veh/day	g/veh-mi	lb/year	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to HF Ramps	0.75	40	11034	0.060	398.435	9.701	6.813	2.203	1.534	0.522
Henry Ford Ramps	0.15	25	5663	0.093	64.418	1.569	1.102	0.356	0.248	0.084
Henry Ford n/o Ramps to Alameda	0.68	25	6841	0.093	351.457	8.558	6.010	1.944	1.353	0.460
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	0.95	40	5368	0.060	246.335	5.998	4.212	1.362	0.948	0.323
SR-103 Anaheim to PCH	0.57	40	5456	0.060	151.537	3.690	2.591	0.838	0.583	0.199
SR-103 PCH to Sepulveda/Willow	1.02	40	6462	0.060	318.705	7.760	5.450	1.763	1.227	0.418
E and W Harry Bridges, Figueroa to start Alameda	1.44	35	11234	0.066	864.244	21.043	14.779	4.780	3.327	1.132
Alameda beginning (E Harry Bridges) to Anaheim	0.77	35	22176	0.066	909.818	22.153	15.558	5.032	3.503	1.192
Alameda Anaheim to Henry Ford	0.42	35	10678	0.066	240.077	5.846	4.105	1.328	0.924	0.315
Alameda Henry Ford to PCH	0.34	35	12037	0.066	220.429	5.367	3.769	1.219	0.849	0.289
Alameda PCH to 405	2.27	45	42261	0.057	4383.307	106.729	74.955	24.241	16.876	5.742
Alameda 405 to del Amo	1.72	45	34681	0.057	2731.359	66.506	46.706	15.105	10.516	3.578
Alameda, del Amo to South Santa Fe Avenue	0.84	45	20740	0.057	797.836	19.426	13.643	4.412	3.072	1.045
Alameda, South Santa Fe Avenue to SR-91	1.15	45	17430	0.057	919.777	22.396	15.728	5.087	3.541	1.205
I-110, "C" Street Interchange to Anaheim	0.49	65	118741	0.074	3499.941	85.220	59.849	19.356	13.475	4.585
I-110, Anaheim to PCH	0.80	65	121451	0.074	5845.007	142.320	99.950	32.325	22.503	7.657
1-110, PCH to Sepulveda	1.39	65	152857	0.074	12697.906	309.181	217.134	70.223	48.887	16.634
I-110, Sepulveda to Carson	1.56	65	175067	0.074	16337.835	397.809	279.377	90.353	62.901	21.403
I-110, Carson to Del Amo	1.02	65	200384	0.074	12268.534	298.726	209.792	67.849	47.234	16.072
I-110, Del Amo to 405	0.74	65	188745	0.074	8380.850	204.065	143.313	46.349	32.266	10.979
I-110, 405 to SR-91	1.09	65	238,636	0.074	15628.790	380.545	267.252	86.432	60.171	20.474
I-710, Anaheim to PCH	0.50	65	114534	0.074	3427.936	83.467	58.618	18.958	13.198	4.491
I-710, PCH to Willow	1.01	65	125067	0.074	7534.955	183.468	128.848	41.671	29.010	9.871
I-710, Willow to 405	1.52	65	127727	0.074	11658.386	283.870	199.358	64.474	44.885	15.272
I-710, 405 to Del Amo	1.42	65	167728	0.074	14267.492	347.399	243.974	78.903	54.930	18.690
I-710, Del Amo to Long Beach Blvd Interchange	1.17	65	168517	0.074	11856.071	288.683	202.739	65.568	45.646	15.531
I-710, Long Beach Boulevard to SR-91	0.96	65	177292	0.074	10209.310	248.586	174.579	56.461	39.306	13.374
PCH, I110 to Alameda	2.38	50	37387	0.056	4024.335	97.988	68.816	22.256	15.494	5.272
PCH, Alameda to SR-103	0.94	50	18492	0.056	787.771	19.181	13.471	4.357	3.033	1.032
PCH, SR-103 to I-710	0.98	50	25284	0.056	1122.942	27.342	19.202	6.210	4.323	1.471
Sepulveda, I-110 to Avalon	1.37	40	19271	0.060	1277.718	31.111	21.849	7.066	4.919	1.674
Sepulveda, Avalon to Alameda	1.70	40	12651	0.060	1040.871	25.344	17.799	5.756	4.007	1.364
Sepulveda, Alameda to ICTF	0.67	40	11138	0.060	363.791	8.858	6.221	2.012	1.401	0.477
Sepulveda, ICTF to SR-103	0.17	40	7584	0.060	62.949	1.533	1.076	0.348	0.242	0.082
Del Amo, I-110 to Wilmington	2.96	40	12369	0.060	1772.430	43.157	30.309	9.802	6.824	2.322
Del Amo, Wilmington to Alameda	0.77	40	32685	0.060	1211.789	29.506	20.722	6.702	4.665	1.587
Del Amo, Alameda to I-710	0.87	40	28407	0.060	1199.817	29.214	20.517	6.635	4.619	1.572
223rd Street, I-110 to Avalon	1.36	45	20033	0.057	1249.506	30.424	21.367	6.910	4.811	1.637
223rd Street, Avalon to Wilmington	1.23	45	13782	0.057	772.814	18.817	13.215	4.274	2.975	1.012
223rd Street, Wilmington to Alameda	0.79	45	14322	0.057	517.103	12.591	8.842	2.860	1.991	0.677
W Wardlow from Alameda to I-710	1.30	45	11783	0.057	700.843	17.065	11.984	3.876	2.698	0.918

Table B-14
2015 Alternative 1
Annual Average Auto Emissions

	Length (mi)	Average Speed mph	Gasoline Autos AADT	ALL Gasoline TOG	ALL Gasoline TOG	AverageToxic Emissions from Autos				
						Benzene 71432	Formaldehyde 50000	1,3-Butadiene 106990	Acetaldehyde 75070	Acrolein 107028
Alternative 1, 2015			veh/day	g/veh-mi	lb/year	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to Transition		55	24466							
New Dock Ramps - Cerritos Channel (A1 Line)	0.24	55	24466	0.058	275.568	6.710	4.712	1.524	1.061	0.361
SB Cerritos Channel - Transition (G1 Line)	0.13	55	12233	0.058	74.633	1.817	1.276	0.413	0.287	0.098
NB Cerritos Channel - Transition (E1 Line)	0.15	55	12233	0.058	86.115	2.097	1.473	0.476	0.332	0.113
Mainline Transition to HF Ramps & SR-103		55	14072							
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	0.23	55	7036	0.058	75.946	1.849	1.299	0.420	0.292	0.099
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	0.20	55	7036	0.058	66.040	1.608	1.129	0.365	0.254	0.087
Henry Ford Ramps	0.31	25	4794	0.093	111.505	2.715	1.907	0.617	0.429	0.146
Henry Ford n/o Ramps to Alameda	0.68	25	6146	0.093	313.571	7.635	5.362	1.734	1.207	0.411
SR-47 Extension, HF Ramps to Alameda		50	10390							
SB, 103 Split to Dominguex Channel (D1 Line)	0.70	50	5195	0.056	164.540	4.006	2.814	0.910	0.633	0.216
NB, 103 Split to Dominguex Channel (F1 Line)	0.69	50	5195	0.056	162.189	3.949	2.773	0.897	0.624	0.212
Dominguex Channel - Alameda (I1 Line)	0.83	50	10390	0.056	390.194	9.501	6.672	2.158	1.502	0.511
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.10	45	9278	0.057	467.002	11.371	7.986	2.583	1.798	0.612
SR-103 Anaheim to PCH	0.57	45	11265	0.057	293.817	7.154	5.024	1.625	1.131	0.385
SR-103 PCH to Sepulveda/Willow	1.02	45	14403	0.057	672.240	16.368	11.495	3.718	2.588	0.881
E and W Harry Bridges, Figueroa to start Alameda	1.44	45	11589	0.057	765.474	18.638	13.090	4.233	2.947	1.003
Alameda beginning (E Harry Bridges) to Anaheim	0.77	45	22410	0.057	789.398	19.221	13.499	4.366	3.039	1.034
Alameda Anaheim to Henry Ford	0.42	45	11861	0.057	228.962	5.575	3.915	1.266	0.882	0.300
Alameda, Henry Ford to PCH	0.34	45	12336	0.057	193.958	4.723	3.317	1.073	0.747	0.254
Alameda PCH to 405	2.27	45	43551	0.057	4517.106	109.987	77.243	24.981	17.391	5.917
Alameda 405 to del Amo	1.72	45	35081	0.057	2762.861	67.273	47.245	15.279	10.637	3.619
Alameda, del Amo to South Santa Fe Avenue	0.84	45	20335	0.057	782.257	19.047	13.377	4.326	3.012	1.025
Alameda, South Santa Fe Avenue to SR-91	1.15	45	17042	0.057	899.303	21.897	15.378	4.973	3.462	1.178
I-110, "C" Street Interchange to Anaheim	0.49	65	113925	0.074	3357.988	81.763	57.422	18.571	12.928	4.399
I-110, Anaheim to PCH	0.80	65	118707	0.074	5712.948	139.104	97.691	31.594	21.995	7.484
1-110, PCH to Sepulveda	1.39	65	152590	0.074	12675.726	308.641	216.755	70.101	48.802	16.605
I-110, Sepulveda to Carson	1.56	65	175359	0.074	16365.085	398.473	279.843	90.504	63.006	21.438
I-110, Carson to Del Amo	1.02	65	200869	0.074	12298.228	299.449	210.300	68.013	47.348	16.111
I-110, Del Amo to 405	0.74	65	188497	0.074	8369.838	203.797	143.124	46.288	32.224	10.964
I-110, 405 to SR-91	1.09	65	238892	0.074	15645.556	380.953	267.539	86.525	60.235	20.496
I-710, Anaheim to PCH	0.50	65	110727	0.074	3313.995	80.692	56.669	18.327	12.759	4.341
I-710, PCH to Willow	1.01	65	122866	0.074	7402.350	180.239	126.580	40.937	28.499	9.697
I-710, Willow to 405	1.52	65	127421	0.074	11630.455	283.189	198.881	64.320	44.777	15.236
I-710, 405 to Del Amo	1.42	65	168271	0.074	14313.681	348.523	244.764	79.159	55.108	18.751
I-710, Del Amo to Long Beach Blvd Interchange	1.17	65	169335	0.074	11913.622	290.084	203.723	65.886	45.867	15.607
I-710, Long Beach Boulevard to SR-91	0.96	65	177257	0.074	10207.295	248.537	174.545	56.449	39.298	13.372
PCH, I110 to Alameda	2.38	50	35262	0.056	3795.600	92.419	64.905	20.991	14.613	4.972
PCH, Alameda to SR-103	0.94	50	19450	0.056	828.583	20.175	14.169	4.582	3.190	1.085
PCH, SR-103 to I-710	0.98	50	16974	0.056	753.869	18.356	12.891	4.169	2.902	0.988
Sepulveda, I-110 to Avalon	1.37	40	18992	0.060	1259.219	30.661	21.533	6.964	4.848	1.650
Sepulveda, Avalon to Alameda	1.70	40	12565	0.060	1033.795	25.172	17.678	5.717	3.980	1.354
Sepulveda, Alameda to ICTF	0.67	40	10584	0.060	345.696	8.417	5.911	1.912	1.331	0.453
Sepulveda, ICTF to SR-103	0.17	40	7344	0.060	60.957	1.484	1.042	0.337	0.235	0.080
Del Amo, I-110 to Wilmington	2.96	40	12432	0.060	1781.457	43.377	30.463	9.852	6.859	2.334
Del Amo, Wilminton to Alameda	0.77	40	33206	0.060	1231.105	29.976	21.052	6.808	4.740	1.613
Del Amo, Alameda to I-710	0.87	40	42211	0.060	1782.852	43.411	30.487	9.860	6.864	2.336
223rd Street, I-110 to Avalon	1.36	45	20029	0.057	1249.257	30.418	21.362	6.909	4.810	1.637
223rd Street, Avalon to Wilmington	1.23	45	14274	0.057	800.402	19.489	13.687	4.426	3.082	1.049
223rd Street, Wilmington to Alameda	0.79	45	15154	0.057	547.143	13.322	9.356	3.026	2.106	0.717
W Wardlow from Alameda to I-710	1.30	45	10649	0.057	633.394	15.422	10.831	3.503	2.439	0.830

Table B-15
2015 Alternative 2
Annual Average Auto Emissions

	Length (mi)	Average Speed mph	Gasoline Autos AADT	ALL Gasoline TOG	ALL Gasoline TOG	AverageToxic Emissions from Autos				
						Benzene 71432	Formaldehyde 50000	1,3-Butadiene 106990	Acetaldehyde 75070	Acrolein 107028
2015, Alternative 2			veh/day	g/veh-mi	lb/year	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to HF Ramps	0.65	55	19244	0.058	587.033	14.294	10.038	3.246	2.260	0.769
Henry Ford Ramps	0.24	25	5588	0.093	100.624	2.450	1.721	0.556	0.387	0.132
Henry Ford n/o Ramps to Alameda	0.68	25	696	0.093	35.510	0.865	0.607	0.196	0.137	0.047
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.04	55	13659	0.058	666.663	16.233	11.400	3.687	2.567	0.873
SR-103 Anaheim to PCH	0.57	55	20236	0.058	541.319	13.181	9.257	2.994	2.084	0.709
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	0.47	55	25717	0.058	567.247	13.812	9.700	3.137	2.184	0.743
SR-103 Ramps south of Sepulveda/Willow		55	13372							
NB Sepulveda Ramp (G2 Line)	0.36	55	8023.2	0.058	135.551	3.301	2.318	0.750	0.522	0.178
SB Sepulveda Ramp (F2 Ramp)	0.38	55	5348.8	0.058	95.388	2.323	1.631	0.528	0.367	0.125
SR-103 Existing, End Ramps to Sepulveda/Willow		55								
SB Sepulveda Ramp Traffic	0.07	55	5348.8	0.058	17.571	0.428	0.300	0.097	0.068	0.023
SB+NB Sepulveda Ramp Traffic	0.11	55	13372	0.058	69.031	1.681	1.180	0.382	0.266	0.090
SR-103, Realignment to End (223rd/Wardlow)	1.85	50	12346	0.056	1033.440	25.163	17.672	5.715	3.979	1.354
E and W Harry Bridges, Figueroa to start Alameda	1.44	35	11597	0.066	892.170	21.723	15.256	4.934	3.435	1.169
Alameda beginning (E Harry Bridges) to Anaheim	0.77	35	22205	0.066	911.008	22.182	15.578	5.038	3.507	1.193
Alameda Anaheim to Henry Ford	0.42	35	11505	0.066	258.670	6.298	4.423	1.431	0.996	0.339
Alameda, Henry Ford to PCH	0.34	35	12198	0.066	223.377	5.439	3.820	1.235	0.860	0.293
Alameda PCH to 405	2.27	45	38621	0.057	4005.767	97.536	68.499	22.153	15.422	5.248
Alameda 405 to del Amo	1.72	45	34954	0.057	2752.859	67.029	47.074	15.224	10.599	3.606
Alameda, del Amo to South Santa Fe Avenue	0.84	45	21300	0.057	819.379	19.951	14.011	4.531	3.155	1.073
Alameda, South Santa Fe Avenue to SR-91	1.15	45	17930	0.057	946.162	23.038	16.179	5.233	3.643	1.239
I-110, "C" Street Interchange to Anaheim	0.49	65	115091	0.074	3392.356	82.600	58.009	18.761	13.061	4.444
I-110, Anaheim to PCH	0.80	65	118882	0.074	5721.370	139.309	97.835	31.641	22.027	7.495
1-110, PCH to Sepulveda	1.39	65	151893	0.074	12617.826	307.231	215.765	69.780	48.579	16.529
I-110, Sepulveda to Carson	1.56	65	174567	0.074	16291.173	396.673	278.579	90.095	62.721	21.341
I-110, Carson to Del Amo	1.02	65	200611	0.074	12282.432	299.064	210.030	67.925	47.287	16.090
I-110, Del Amo to 405	0.74	65	188206	0.074	8356.917	203.482	142.903	46.216	32.174	10.948
I-110, 405 to SR-91	1.09	65	238771	0.074	15637.631	380.760	267.403	86.481	60.205	20.485
I-710, Anaheim to PCH	0.50	65	112326	0.074	3361.852	81.858	57.488	18.592	12.943	4.404
I-710, PCH to Willow	1.01	65	122653	0.074	7389.518	179.927	126.361	40.866	28.450	9.680
I-710, Willow to 405	1.52	65	126607	0.074	11556.157	281.380	197.610	63.909	44.491	15.139
I-710, 405 to Del Amo	1.42	65	168254	0.074	14312.235	348.488	244.739	79.151	55.102	18.749
I-710, Del Amo to Long Beach Blvd Interchange	1.17	65	169110	0.074	11897.792	289.699	203.452	65.798	45.807	15.586
I-710, Long Beach Boulevard to SR-91	0.96	65	177538	0.074	10223.476	248.931	174.821	56.539	39.360	13.393
PCH, I-110 to Alameda	2.38	50	33666	0.056	3623.807	88.236	61.967	20.041	13.952	4.747
PCH, Alameda to SR-103	0.94	50	17366	0.056	739.803	18.013	12.651	4.091	2.848	0.969
PCH, SR-103 to I-710	0.98	50	17480	0.056	776.342	18.903	13.275	4.293	2.989	1.017
Sepulveda, I-110 to Avalon	1.37	40	19113	0.060	1267.242	30.856	21.670	7.008	4.879	1.660
Sepulveda, Avalon to Alameda	1.70	40	12455	0.060	1024.745	24.951	17.523	5.667	3.945	1.342
Sepulveda, Alameda to ICTF	0.67	40	10067	0.060	328.810	8.006	5.623	1.818	1.266	0.431
Sepulveda, ICTF to SR-103	0.17	40	6757	0.060	56.085	1.366	0.959	0.310	0.216	0.073
Del Amo, I-110 to Wilmington	2.96	40	12308	0.060	1763.689	42.944	30.159	9.754	6.790	2.310
Del Amo, Wilmington to Alameda	0.77	40	32393	0.060	1200.963	29.242	20.536	6.642	4.624	1.573
Del Amo, Alameda to I-710	0.87	40	27842	0.060	1175.953	28.633	20.109	6.503	4.527	1.540
223rd Street, I-110 to Avalon	1.36	45	19709	0.057	1229.298	29.932	21.021	6.798	4.733	1.610
223rd Street, Avalon to Wilmington	1.23	45	14290	0.057	801.300	19.511	13.702	4.431	3.085	1.050
223rd Street, Wilmington to Alameda	0.79	45	14504	0.057	523.674	12.751	8.955	2.896	2.016	0.686
W Wardlow from Alameda to I-710	1.30	45	10662	0.057	634.166861	15.441	10.844	3.507	2.442	0.831

Table B-16
2030 No Build
Annual Average Auto Emissions

	Length (mi)	Average Speed mph	Gasoline Autos AADT	ALL Gasoline TOG	ALL Gasoline TOG	AverageToxic Emissions from Autos				
						Benzene 71432	Formaldehyde 50000	1,3-Butadiene 106990	Acetaldehyde 75070	Acrolein 107028
Baseline 2030			veh/day	g/veh-mi	lb/year	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to HF Ramps	0.75	40	16328	0.018	176.341	3.717	2.398	0.822	0.432	0.199
Henry Ford Ramps	0.15	25	7181	0.030	26.282	0.554	0.357	0.122	0.064	0.030
Henry Ford n/o Ramps to Alameda	0.68	25	9382	0.030	155.083	3.269	2.109	0.722	0.380	0.175
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	0.95	40	9144	0.018	125.500	2.645	1.707	0.585	0.307	0.142
SR-103 Anaheim to PCH	0.57	40	11453	0.018	95.139	2.005	1.294	0.443	0.233	0.108
SR-103 PCH to Sepulveda/Willow	1.02	40	13443	0.018	198.296	4.180	2.697	0.924	0.486	0.224
E and W Harry Bridges, Figueroa to start Alameda	1.44	35	15557	0.020	361.409	7.618	4.915	1.684	0.885	0.408
Alameda beginning (E Harry Bridges) to Anaheim	0.77	35	24775	0.020	306.942	6.470	4.174	1.430	0.752	0.347
Alameda Anaheim to Henry Ford	0.42	35	11304	0.020	76.747	1.618	1.044	0.358	0.188	0.087
Alameda Henry Ford to PCH	0.34	35	12403	0.020	68.588	1.446	0.933	0.320	0.168	0.078
Alameda PCH to 405	2.27	45	46881	0.017	1453.671	30.643	19.770	6.772	3.561	1.643
Alameda 405 to del Amo	1.72	45	43124	0.017	1015.344	21.403	13.809	4.730	2.488	1.147
Alameda, del Amo to South Santa Fe Avenue	0.84	45	29565	0.017	340.009	7.167	4.624	1.584	0.833	0.384
Alameda, South Santa Fe Avenue to SR-91	1.15	45	22466	0.017	354.420	7.471	4.820	1.651	0.868	0.400
I-110, "C" Street Interchange to Anaheim	0.49	65	136693	0.022	1190.285	25.091	16.188	5.545	2.916	1.345
I-110, Anaheim to PCH	0.80	65	137781	0.022	1958.926	41.293	26.641	9.126	4.799	2.214
1-110, PCH to Sepulveda	1.39	65	167600	0.022	4113.065	86.701	55.938	19.162	10.077	4.648
I-110, Sepulveda to Carson	1.56	65	207199	0.022	5712.453	120.416	77.689	26.613	13.996	6.455
I-110, Carson to Del Amo	1.02	65	214674	0.022	3882.879	81.849	52.807	18.089	9.513	4.388
I-110, Del Amo to 405	0.74	65	227995	0.022	2990.768	63.044	40.674	13.933	7.327	3.380
I-110, 405 to SR-91	1.09	65	257,149	0.022	4975.297	104.877	67.664	23.179	12.189	5.622
I-710, Anaheim to PCH	0.50	65	113489	0.022	1003.453	21.152	13.647	4.675	2.458	1.134
I-710, PCH to Willow	1.01	65	118558	0.022	2110.151	44.481	28.698	9.831	5.170	2.384
I-710, Willow to 405	1.52	65	122715	0.022	3309.010	69.752	45.003	15.416	8.107	3.739
I-710, 405 to Del Amo	1.42	65	168842	0.022	4242.944	89.439	57.704	19.767	10.395	4.795
I-710, Del Amo to Long Beach Blvd Interchange	1.17	65	169420	0.022	3521.329	74.228	47.890	16.405	8.627	3.979
I-710, Long Beach Boulevard to SR-91	0.96	65	218049	0.022	3709.421	78.193	50.448	17.281	9.088	4.192
PCH, I110 to Alameda	2.38	50	42512	0.017	1383.490	29.163	18.815	6.445	3.390	1.563
PCH, Alameda to SR-103	0.94	50	23667	0.017	304.825	6.426	4.146	1.420	0.747	0.344
PCH, SR-103 to I-710	0.98	50	25904	0.017	347.832	7.332	4.731	1.620	0.852	0.393
Sepulveda, I-110 to Avalon	1.37	40	25893	0.018	513.461	10.824	6.983	2.392	1.258	0.580
Sepulveda, Avalon to Alameda	1.70	40	25952	0.018	638.613	13.462	8.685	2.975	1.565	0.722
Sepulveda, Alameda to ICTF	0.67	40	10818	0.018	105.679	2.228	1.437	0.492	0.259	0.119
Sepulveda, ICTF to SR-103	0.17	40	7191	0.018	17.852	0.376	0.243	0.083	0.044	0.020
Del Amo, I-110 to Wilmington	2.96	40	24830	0.018	1064.157	22.432	14.473	4.958	2.607	1.202
Del Amo, Wilmington to Alameda	0.77	40	36806	0.018	408.124	8.603	5.550	1.901	1.000	0.461
Del Amo, Alameda to I-710	0.87	40	48649	0.018	614.551	12.954	8.358	2.863	1.506	0.694
223rd Street, I-110 to Avalon	1.36	45	25206	0.017	470.006	9.907	6.392	2.190	1.152	0.531
223rd Street, Avalon to Wilmington	1.23	45	17782	0.017	298.092	6.284	4.054	1.389	0.730	0.337
223rd Street, Wilmington to Alameda	0.79	45	20883	0.017	225.410	4.752	3.066	1.050	0.552	0.255
W Wardlow from Alameda to I-710	1.30	45	36501	0.017	649.048	13.682	8.827	3.024	1.590	0.733

Table B-17
2030 Alternative 1
Annual Average Auto Emissions

	Length (mi)	Average Speed mph	Gasoline Autos AADT	ALL Gasoline TOG	ALL Gasoline TOG	AverageToxic Emissions from Autos				
						Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
						71432	50000	106990	75070	107028
Alternative 1, 2030			veh/day	g/veh-mi	lb/year	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to Transition		55	27767							
New Dock Ramps - Cerritos Channel (A1 Line)	0.24	55	27767	0.017	91.163	1.922	1.240	0.425	0.223	0.103
SB Cerritos Channel - Transition (G1 Line)	0.13	55	13883.5	0.017	24.690	0.520	0.336	0.115	0.060	0.028
NB Cerritos Channel - Transition (E1 Line)	0.15	55	13883.5	0.017	28.488	0.601	0.387	0.133	0.070	0.032
Mainline Transition to HF Ramps & SR-103		55	19285							
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	0.23	55	9642.5	0.017	30.339	0.640	0.413	0.141	0.074	0.034
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	0.20	55	9642.5	0.017	26.381	0.556	0.359	0.123	0.065	0.030
Henry Ford Ramps	0.31	25	6307	0.030	47.199	0.995	0.642	0.220	0.116	0.053
Henry Ford n/o Ramps to Alameda	0.68	25	10068	0.030	165.273	3.484	2.248	0.770	0.405	0.187
SR-47 Extension, HF Ramps to Alameda		50	8473							
SB, 103 Split to Dominguex Channel (D1 Line)	0.70	50	4236.5	0.017	40.568	0.855	0.552	0.189	0.099	0.046
NB, 103 Split to Dominguex Channel (F1 Line)	0.69	50	4236.5	0.017	39.988	0.843	0.544	0.186	0.098	0.045
Dominguex Channel - Alameda (I1 Line)	0.83	50	8473	0.017	96.204	2.028	1.308	0.448	0.236	0.109
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.10	45	12978	0.017	195.289	4.117	2.656	0.910	0.478	0.221
SR-103 Anaheim to PCH	0.57	45	16446	0.017	128.237	2.703	1.744	0.597	0.314	0.145
SR-103 PCH to Sepulveda/Willow	1.02	45	20388	0.017	284.481	5.997	3.869	1.325	0.697	0.321
E and W Harry Bridges, Figueroa to start Alameda	1.44	45	15143	0.017	299.022	6.303	4.067	1.393	0.733	0.338
Alameda beginning (E Harry Bridges) to Anaheim	0.77	45	25372	0.017	267.187	5.632	3.634	1.245	0.655	0.302
Alameda Anaheim to Henry Ford	0.42	45	13135	0.017	75.802	1.598	1.031	0.353	0.186	0.086
Alameda, Henry Ford to PCH	0.34	45	14514	0.017	68.222	1.438	0.928	0.318	0.167	0.077
Alameda PCH to 405	2.27	45	42779	0.017	1326.477	27.961	18.040	6.180	3.250	1.499
Alameda 405 to del Amo	1.72	45	41381	0.017	974.305	20.538	13.251	4.539	2.387	1.101
Alameda, del Amo to South Santa Fe Avenue	0.84	45	27756	0.017	319.204	6.729	4.341	1.487	0.782	0.361
Alameda, South Santa Fe Avenue to SR-91	1.15	45	21886	0.017	345.270	7.278	4.696	1.609	0.846	0.390
I-110, "C" Street Interchange to Anaheim	0.49	65	132562	0.022	1154.314	24.332	15.699	5.378	2.828	1.304
I-110, Anaheim to PCH	0.80	65	134584	0.022	1913.472	40.335	26.023	8.914	4.688	2.162
1-110, PCH to Sepulveda	1.39	65	167512	0.022	4110.905	86.656	55.908	19.152	10.072	4.645
I-110, Sepulveda to Carson	1.56	65	208028	0.022	5735.309	120.897	78.000	26.720	14.052	6.481
I-110, Carson to Del Amo	1.02	65	215598	0.022	3899.592	82.201	53.034	18.167	9.554	4.407
I-110, Del Amo to 405	0.74	65	228689	0.022	2999.872	63.236	40.798	13.976	7.350	3.390
I-110, 405 to SR-91	1.09	65	257876	0.022	4989.363	105.173	67.855	23.244	12.224	5.638
I-710, Anaheim to PCH	0.50	65	113993	0.022	1007.909	21.246	13.708	4.696	2.469	1.139
I-710, PCH to Willow	1.01	65	119873	0.022	2133.556	44.974	29.016	9.940	5.227	2.411
I-710, Willow to 405	1.52	65	126049	0.022	3398.912	71.647	46.225	15.835	8.327	3.841
I-710, 405 to Del Amo	1.42	65	171458	0.022	4308.684	90.825	58.598	20.073	10.556	4.869
I-710, Del Amo to Long Beach Blvd Interchange	1.17	65	170964	0.022	3553.420	74.904	48.327	16.555	8.706	4.015
I-710, Long Beach Boulevard to SR-91	0.96	65	217092	0.022	3693.141	77.850	50.227	17.206	9.048	4.173
PCH, I110 to Alameda	2.38	50	39410	0.017	1282.540	27.035	17.443	5.975	3.142	1.449
PCH, Alameda to SR-103	0.94	50	25720	0.017	331.267	6.983	4.505	1.543	0.812	0.374
PCH, SR-103 to I-710	0.98	50	26565	0.017	356.708	7.519	4.851	1.662	0.874	0.403
Sepulveda, I-110 to Avalon	1.37	40	25720	0.018	510.031	10.751	6.936	2.376	1.250	0.576
Sepulveda, Avalon to Alameda	1.70	40	25453	0.018	626.333	13.203	8.518	2.918	1.535	0.708
Sepulveda, Alameda to ICTF	0.67	40	10843	0.018	105.923	2.233	1.441	0.493	0.260	0.120
Sepulveda, ICTF to SR-103	0.17	40	7282	0.018	18.077	0.381	0.246	0.084	0.044	0.020
Del Amo, I-110 to Wilmington	2.96	40	24434	0.018	1047.186	22.074	14.242	4.879	2.566	1.183
Del Amo, Wilmington to Alameda	0.77	40	36144	0.018	400.783	8.448	5.451	1.867	0.982	0.453
Del Amo, Alameda to I-710	0.87	40	47972	0.018	605.999	12.774	8.242	2.823	1.485	0.685
223rd Street, I-110 to Avalon	1.36	45	25122	0.017	468.440	9.874	6.371	2.182	1.148	0.529
223rd Street, Avalon to Wilmington	1.23	45	17431	0.017	292.208	6.160	3.974	1.361	0.716	0.330
223rd Street, Wilmington to Alameda	0.79	45	20968	0.017	226.328	4.771	3.078	1.054	0.555	0.256
W Wardlow from Alameda to I-710	1.30	45	36001	0.017	640.157	13.494	8.706	2.982	1.568	0.723

Table B-18
2030 Alternative 2
Annual Average Auto Emissions

	Length (mi)	Average Speed mph	Gasoline Autos AADT	ALL Gasoline TOG	ALL Gasoline TOG	AverageToxic Emissions from Autos				
						Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
						71432	50000	106990	75070	107028
2030 Alternative 2			veh/day	g/veh-mi	lb/year	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to HF Ramps	0.65	55	23431	0.017	208.345	4.392	2.833	0.971	0.510	0.235
Henry Ford Ramps	0.24	25	7460	0.030	43.222	0.911	0.588	0.201	0.106	0.049
Henry Ford n/o Ramps to Alameda	0.68	25	9126	0.030	149.810	3.158	2.037	0.698	0.367	0.169
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.04	55	15964	0.017	227.119	4.788	3.089	1.058	0.556	0.257
SR-103 Anaheim to PCH	0.57	55	24126	0.017	188.122	3.966	2.558	0.876	0.461	0.213
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	0.47	55	30198	0.017	194.158	4.093	2.641	0.905	0.476	0.219
SR-103 Ramps south of Sepulveda/Willow		55	17931							
NB Sepulveda Ramp (G2 Line)	0.36	55	10758.6	0.017	52.983	1.117	0.721	0.247	0.130	0.060
SB Sepulveda Ramp (F2 Ramp)	0.38	55	7172.4	0.017	37.284	0.786	0.507	0.174	0.091	0.042
SR-103 Existing, End Ramps to Sepulveda/Willow		55								
SB Sepulveda Ramp Traffic	0.07	55	7172.4	0.017	6.868	0.145	0.093	0.032	0.017	0.008
SB+NB Sepulveda Ramp Traffic	0.11	55	17931	0.017	26.982	0.569	0.367	0.126	0.066	0.030
SR-103, Realignment to End (223rd/Wardlow)	1.85	50	12267	0.017	310.448	6.544	4.222	1.446	0.761	0.351
E and W Harry Bridges, Figueroa to start Alameda	1.44	35	14945	0.020	347.191	7.319	4.722	1.617	0.851	0.392
Alameda beginning (E Harry Bridges) to Anaheim	0.77	35	24731	0.020	306.397	6.459	4.167	1.427	0.751	0.346
Alameda Anaheim to Henry Ford	0.42	35	12339	0.020	83.774	1.766	1.139	0.390	0.205	0.095
Alameda, Henry Ford to PCH	0.34	35	13285	0.020	73.465	1.549	0.999	0.342	0.180	0.083
Alameda PCH to 405	2.27	45	43029	0.017	1334.229	28.125	18.146	6.216	3.269	1.508
Alameda 405 to del Amo	1.72	45	41356	0.017	973.717	20.525	13.243	4.536	2.386	1.100
Alameda, del Amo to South Santa Fe Avenue	0.84	45	29716	0.017	341.745	7.204	4.648	1.592	0.837	0.386
Alameda, South Santa Fe Avenue to SR-91	1.15	45	23624	0.017	372.688	7.856	5.069	1.736	0.913	0.421
I-110, "C" Street Interchange to Anaheim	0.49	65	132764	0.022	1156.073	24.369	15.723	5.386	2.832	1.306
I-110, Anaheim to PCH	0.80	65	135680	0.022	1929.055	40.663	26.235	8.987	4.726	2.180
1-110, PCH to Sepulveda	1.39	65	167211	0.022	4103.518	86.500	55.808	19.117	10.054	4.637
I-110, Sepulveda to Carson	1.56	65	208207	0.022	5740.244	121.001	78.067	26.743	14.064	6.486
I-110, Carson to Del Amo	1.02	65	216230	0.022	3911.023	82.442	53.190	18.221	9.582	4.419
I-110, Del Amo to 405	0.74	65	229039	0.022	3004.463	63.333	40.861	13.997	7.361	3.395
I-110, 405 to SR-91	1.09	65	258623	0.022	5003.816	105.478	68.052	23.312	12.259	5.654
I-710, Anaheim to PCH	0.50	65	115945	0.022	1025.168	21.610	13.942	4.776	2.512	1.158
I-710, PCH to Willow	1.01	65	121538	0.022	2163.191	45.599	29.419	10.078	5.300	2.444
I-710, Willow to 405	1.52	65	126938	0.022	3422.884	72.153	46.551	15.946	8.386	3.868
I-710, 405 to Del Amo	1.42	65	170564	0.022	4286.218	90.351	58.293	19.969	10.501	4.843
I-710, Del Amo to Long Beach Blvd Interchange	1.17	65	170006	0.022	3533.508	74.485	48.056	16.462	8.657	3.993
I-710, Long Beach Boulevard to SR-91	0.96	65	216007	0.022	3674.683	77.460	49.976	17.120	9.003	4.152
PCH, I-110 to Alameda	2.38	50	40452	0.017	1316.450	27.750	17.904	6.133	3.225	1.488
PCH, Alameda to SR-103	0.94	50	23473	0.017	302.326	6.373	4.112	1.408	0.741	0.342
PCH, SR-103 to I-710	0.98	50	28355	0.017	380.743	8.026	5.178	1.774	0.933	0.430
Sepulveda, I-110 to Avalon	1.37	40	26102	0.018	517.606	10.911	7.039	2.411	1.268	0.585
Sepulveda, Avalon to Alameda	1.70	40	26227	0.018	645.380	13.604	8.777	3.007	1.581	0.729
Sepulveda, Alameda to ICTF	0.67	40	11557	0.018	112.898	2.380	1.535	0.526	0.277	0.128
Sepulveda, ICTF to SR-103	0.17	40	7711	0.018	19.142	0.404	0.260	0.089	0.047	0.022
Del Amo, I-110 to Wilmington	2.96	40	24862	0.018	1065.529	22.461	14.491	4.964	2.611	1.204
Del Amo, Wilmington to Alameda	0.77	40	35888	0.018	397.945	8.388	5.412	1.854	0.975	0.450
Del Amo, Alameda to I-710	0.87	40	46310	0.018	585.004	12.332	7.956	2.725	1.433	0.661
223rd Street, I-110 to Avalon	1.36	45	24278	0.017	452.702	9.543	6.157	2.109	1.109	0.512
223rd Street, Avalon to Wilmington	1.23	45	17354	0.017	290.917	6.132	3.956	1.355	0.713	0.329
223rd Street, Wilmington to Alameda	0.79	45	19665	0.017	212.263	4.474	2.887	0.989	0.520	0.240
W Wardlow from Alameda to I-710	1.30	45	35615	0.017	633.293	13.349	8.613	2.950	1.552	0.716

Table B-19
2015 No Build
Maximum Hourly Auto Emissions

	Length (mi)	Congst Speed mph	SCAG Gasoline vehicles	SCAG Gasoline TOG	SCAG Gasoline TOG	Max Hourly Toxics from Autos				
						Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
						71432	50000	106990	75070	107028
Baseline 2015			vph	g/veh-mi	lb/hour	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	0.75	40	2261	0.060	0.22	5.45E-03	3.82E-03	1.24E-03	8.61E-04	2.93E-04
Henry Ford Ramps	0.15	15	966	0.160	0.05	1.26E-03	8.85E-04	2.86E-04	1.99E-04	6.78E-05
Henry Ford n/o Ramps to Alameda	0.68	15	1135	0.160	0.27	6.69E-03	4.70E-03	1.52E-03	1.06E-03	3.60E-04
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	0.95	40	1293	0.060	0.16	3.96E-03	2.78E-03	8.99E-04	6.26E-04	2.13E-04
SR-103 Anaheim to PCH	0.57	40	1597	0.060	0.12	2.96E-03	2.08E-03	6.72E-04	4.68E-04	1.59E-04
SR-103 PCH to Sepulveda/Willow	1.02	40	1684	0.060	0.23	5.54E-03	3.89E-03	1.26E-03	8.76E-04	2.98E-04
E and W Harry Bridges, Figueroa to start Alameda	1.44	25	1398	0.093	0.41	1.01E-02	7.09E-03	2.29E-03	1.60E-03	5.43E-04
Alameda beginning (E Harry Bridges) to Anaheim	0.77	25	2393	0.093	0.38	9.22E-03	6.48E-03	2.09E-03	1.46E-03	4.96E-04
Alameda Anaheim to Henry Ford	0.42	25	1324	0.093	0.11	2.80E-03	1.96E-03	6.35E-04	4.42E-04	1.50E-04
Alameda Henry Ford to PCH	0.34	25	1537	0.093	0.11	2.64E-03	1.86E-03	6.00E-04	4.18E-04	1.42E-04
Alameda PCH to 405	2.27	35	4499	0.066	1.49	3.63E-02	2.55E-02	8.23E-03	5.73E-03	1.95E-03
Alameda 405 to del Amo	1.72	40	4162	0.060	0.95	2.31E-02	1.63E-02	5.26E-03	3.66E-03	1.25E-03
Alameda, del Amo to South Santa Fe Avenue	0.84	40	3558	0.060	0.40	9.66E-03	6.79E-03	2.19E-03	1.53E-03	5.20E-04
Alameda, South Santa Fe Avenue to SR-91	1.15	40	2532	0.060	0.39	9.43E-03	6.63E-03	2.14E-03	1.49E-03	5.08E-04
I-110, "C" Street Interchange to Anaheim	0.49	45	10874	0.057	0.67	1.63E-02	1.15E-02	3.71E-03	2.58E-03	8.78E-04
I-110, Anaheim to PCH	0.80	45	10985	0.057	1.11	2.69E-02	1.89E-02	6.12E-03	4.26E-03	1.45E-03
1-110, PCH to Sepulveda	1.39	45	12661	0.057	2.20	5.36E-02	3.76E-02	1.22E-02	8.47E-03	2.88E-03
I-110, Sepulveda to Carson	1.56	45	13861	0.057	2.71	6.59E-02	4.63E-02	1.50E-02	1.04E-02	3.55E-03
I-110, Carson to Del Amo	1.02	45	15736	0.057	2.02	4.91E-02	3.45E-02	1.11E-02	7.76E-03	2.64E-03
I-110, Del Amo to 405	0.74	45	16756	0.057	1.56	3.79E-02	2.66E-02	8.61E-03	5.99E-03	2.04E-03
I-110, 405 to SR-91	1.09	45	19272	0.057	2.64	6.43E-02	4.52E-02	1.46E-02	1.02E-02	3.46E-03
I-710, Anaheim to PCH	0.50	40	8775	0.060	0.58	1.42E-02	9.94E-03	3.22E-03	2.24E-03	7.62E-04
I-710, PCH to Willow	1.01	40	9507	0.060	1.27	3.09E-02	2.17E-02	7.01E-03	4.88E-03	1.66E-03
I-710, Willow to 405	1.52	40	10013	0.060	2.02	4.93E-02	3.46E-02	1.12E-02	7.79E-03	2.65E-03
I-710, 405 to Del Amo	1.42	40	13205	0.060	2.49	6.06E-02	4.25E-02	1.38E-02	9.58E-03	3.26E-03
I-710, Del Amo to Long Beach Blvd Interchange	1.17	40	13116	0.060	2.04	4.97E-02	3.49E-02	1.13E-02	7.87E-03	2.68E-03
I-710, Long Beach Boulevard to SR-91	0.96	40	16466	0.060	2.10	5.11E-02	3.59E-02	1.16E-02	8.08E-03	2.75E-03
PCH, I110 to Alameda	2.38	20	4089	0.119	2.55	6.21E-02	4.36E-02	1.41E-02	9.83E-03	3.34E-03
PCH, Alameda to SR-103	0.94	20	2387	0.119	0.59	1.44E-02	1.01E-02	3.26E-03	2.27E-03	7.72E-04
PCH, SR-103 to I-710	0.98	20	2263	0.119	0.58	1.42E-02	9.97E-03	3.22E-03	2.24E-03	7.63E-04
Sepulveda, I-110 to Avalon	1.37	25	1989	0.093	0.56	1.36E-02	9.57E-03	3.10E-03	2.16E-03	7.33E-04
Sepulveda, Avalon to Alameda	1.70	25	1786	0.093	0.62	1.52E-02	1.07E-02	3.45E-03	2.40E-03	8.17E-04
Sepulveda, Alameda to ICTF	0.67	25	1148	0.093	0.16	3.88E-03	2.72E-03	8.80E-04	6.13E-04	2.08E-04
Sepulveda, ICTF to SR-103	0.17	25	900	0.093	0.03	7.72E-04	5.42E-04	1.75E-04	1.22E-04	4.15E-05
Del Amo, I-110 to Wilmington	2.96	25	1927	0.093	1.17	2.85E-02	2.00E-02	6.48E-03	4.51E-03	1.54E-03
Del Amo, Wilminton to Alameda	0.77	25	2901	0.093	0.46	1.11E-02	7.81E-03	2.52E-03	1.76E-03	5.98E-04
Del Amo, Alameda to I-710	0.87	25	4023	0.093	0.72	1.76E-02	1.23E-02	3.99E-03	2.78E-03	9.45E-04
223rd Street, I-110 to Avalon	1.36	25	2164	0.093	0.61	1.48E-02	1.04E-02	3.35E-03	2.33E-03	7.94E-04
223rd Street, Avalon to Wilmington	1.23	25	1636	0.093	0.41	1.00E-02	7.05E-03	2.28E-03	1.59E-03	5.40E-04
223rd Street, Wilmington to Alameda	0.79	25	2464	0.093	0.40	9.73E-03	6.83E-03	2.21E-03	1.54E-03	5.24E-04
W Wardlow from Alameda to I-710	1.30	25	3054	0.093	0.82	1.99E-02	1.40E-02	4.51E-03	3.14E-03	1.07E-03

Table B-20
2015 Alternative 1
Maximum Hourly Auto Emissions

	Length (mi)	Congst Speed mph	SCAG Gasoline vehicles	SCAG Gasoline TOG	SCAG Gasoline TOG	Max Hourly Toxics from Autos				
						Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
						71432	50000	106990	75070	107028
Alternative 1, 2015			vph	g/veh-mi	lb/hour	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to Transition		55	3392							
New Dock Ramps - Cerritos Channel (A1 Line)	0.24	55	3392	0.058	0.10	2.55E-03	1.79E-03	5.79E-04	4.03E-04	1.37E-04
SB Cerritos Channel - Transition (G1 Line)	0.13	55	1696	0.058	0.03	6.90E-04	4.85E-04	1.57E-04	1.09E-04	3.71E-05
NB Cerritos Channel - Transition (E1 Line)	0.15	55	1696	0.058	0.03	7.96E-04	5.59E-04	1.81E-04	1.26E-04	4.28E-05
Mainline Transition to HF Ramps & SR-103		55	2256							
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	0.23	55	1128	0.058	0.03	8.12E-04	5.70E-04	1.84E-04	1.28E-04	4.37E-05
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	0.20	55	1128	0.058	0.03	7.06E-04	4.96E-04	1.60E-04	1.12E-04	3.80E-05
Henry Ford Ramps	0.31	20	752	0.119	0.06	1.49E-03	1.05E-03	3.38E-04	2.35E-04	8.01E-05
Henry Ford n/o Ramps to Alameda	0.68	20	984	0.119	0.18	4.27E-03	3.00E-03	9.71E-04	6.76E-04	2.30E-04
SR-47 Extension, HF Ramps to Alameda		50	1135							
SB, 103 Split to Dominguex Channel (D1 Line)	0.70	50	567.5	0.056	0.05	1.20E-03	8.42E-04	2.72E-04	1.90E-04	6.45E-05
NB, 103 Split to Dominguex Channel (F1 Line)	0.69	50	567.5	0.056	0.05	1.18E-03	8.30E-04	2.68E-04	1.87E-04	6.36E-05
Dominguex Channel - Alameda (I1 Line)	0.83	50	1135	0.056	0.12	2.84E-03	2.00E-03	6.46E-04	4.50E-04	1.53E-04
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.10	45	1504	0.057	0.21	5.05E-03	3.55E-03	1.15E-03	7.99E-04	2.72E-04
SR-103 Anaheim to PCH	0.57	45	2000	0.057	0.14	3.48E-03	2.44E-03	7.90E-04	5.50E-04	1.87E-04
SR-103 PCH to Sepulveda/Willow	1.02	45	2287	0.057	0.29	7.12E-03	5.00E-03	1.62E-03	1.13E-03	3.83E-04
E and W Harry Bridges, Figueroa to start Alameda	1.44	40	1360	0.060	0.26	6.34E-03	4.45E-03	1.44E-03	1.00E-03	3.41E-04
Alameda beginning (E Harry Bridges) to Anaheim	0.77	40	2312	0.060	0.24	5.75E-03	4.04E-03	1.31E-03	9.09E-04	3.09E-04
Alameda Anaheim to Henry Ford	0.42	40	1471	0.060	0.08	2.00E-03	1.41E-03	4.55E-04	3.17E-04	1.08E-04
Alameda, Henry Ford to PCH	0.34	40	1568	0.060	0.07	1.74E-03	1.22E-03	3.95E-04	2.75E-04	9.36E-05
Alameda PCH to 405	2.27	35	4166	0.066	1.38	3.36E-02	2.36E-02	7.63E-03	5.31E-03	1.81E-03
Alameda 405 to del Amo	1.72	40	3931	0.060	0.90	2.19E-02	1.54E-02	4.96E-03	3.46E-03	1.18E-03
Alameda, del Amo to South Santa Fe Avenue	0.84	40	3082	0.060	0.34	8.37E-03	5.88E-03	1.90E-03	1.32E-03	4.50E-04
Alameda, South Santa Fe Avenue to SR-91	1.15	40	2356	0.060	0.36	8.78E-03	6.16E-03	1.99E-03	1.39E-03	4.72E-04
I-110, "C" Street Interchange to Anaheim	0.49	45	10529	0.057	0.65	1.58E-02	1.11E-02	3.59E-03	2.50E-03	8.51E-04
I-110, Anaheim to PCH	0.80	45	10815	0.057	1.09	2.65E-02	1.86E-02	6.02E-03	4.19E-03	1.43E-03
1-110, PCH to Sepulveda	1.39	45	12602	0.057	2.19	5.33E-02	3.75E-02	1.21E-02	8.43E-03	2.87E-03
I-110, Sepulveda to Carson	1.56	45	13903	0.057	2.71	6.61E-02	4.64E-02	1.50E-02	1.05E-02	3.56E-03
I-110, Carson to Del Amo	1.02	45	15794	0.057	2.02	4.93E-02	3.46E-02	1.12E-02	7.79E-03	2.65E-03
I-110, Del Amo to 405	0.74	45	16828	0.057	1.56	3.81E-02	2.67E-02	8.64E-03	6.02E-03	2.05E-03
I-110, 405 to SR-91	1.09	45	19305	0.057	2.65	6.44E-02	4.52E-02	1.46E-02	1.02E-02	3.46E-03
I-710, Anaheim to PCH	0.50	40	8749	0.060	0.58	1.41E-02	9.91E-03	3.21E-03	2.23E-03	7.60E-04
I-710, PCH to Willow	1.01	40	9714	0.060	1.30	3.16E-02	2.22E-02	7.17E-03	4.99E-03	1.70E-03
I-710, Willow to 405	1.52	40	10277	0.060	2.08	5.06E-02	3.55E-02	1.15E-02	8.00E-03	2.72E-03
I-710, 405 to Del Amo	1.42	40	13477	0.060	2.54	6.18E-02	4.34E-02	1.40E-02	9.77E-03	3.33E-03
I-710, Del Amo to Long Beach Blvd Interchange	1.17	40	13384	0.060	2.08	5.08E-02	3.57E-02	1.15E-02	8.03E-03	2.73E-03
I-710, Long Beach Boulevard to SR-91	0.96	40	16588	0.060	2.11	5.15E-02	3.62E-02	1.17E-02	8.14E-03	2.77E-03
PCH, I110 to Alameda	2.38	20	4088	0.119	2.55	6.21E-02	4.36E-02	1.41E-02	9.82E-03	3.34E-03
PCH, Alameda to SR-103	0.94	20	2339	0.119	0.58	1.41E-02	9.88E-03	3.20E-03	2.22E-03	7.57E-04
PCH, SR-103 to I-710	0.98	20	2355	0.119	0.61	1.48E-02	1.04E-02	3.35E-03	2.33E-03	7.95E-04
Sepulveda, I-110 to Avalon	1.37	25	2034	0.093	0.57	1.39E-02	9.79E-03	3.17E-03	2.20E-03	7.50E-04
Sepulveda, Avalon to Alameda	1.70	25	2210	0.093	0.77	1.88E-02	1.32E-02	4.27E-03	2.97E-03	1.01E-03
Sepulveda, Alameda to ICTF	0.67	25	1215	0.093	0.17	4.10E-03	2.88E-03	9.32E-04	6.49E-04	2.21E-04
Sepulveda, ICTF to SR-103	0.17	25	962	0.093	0.03	8.25E-04	5.80E-04	1.87E-04	1.30E-04	4.44E-05
Del Amo, I-110 to Wilmington	2.96	25	1982	0.093	1.21	2.94E-02	2.06E-02	6.67E-03	4.64E-03	1.58E-03
Del Amo, Wilminton to Alameda	0.77	25	2912	0.093	0.46	1.12E-02	7.84E-03	2.53E-03	1.76E-03	6.00E-04
Del Amo, Alameda to I-710	0.87	25	3962	0.093	0.71	1.73E-02	1.21E-02	3.93E-03	2.73E-03	9.30E-04
223rd Street, I-110 to Avalon	1.36	25	2138	0.093	0.60	1.46E-02	1.02E-02	3.31E-03	2.31E-03	7.85E-04
223rd Street, Avalon to Wilmington	1.23	25	1617	0.093	0.41	9.92E-03	6.97E-03	2.25E-03	1.57E-03	5.34E-04
223rd Street, Wilmington to Alameda	0.79	25	2368	0.093	0.38	9.35E-03	6.57E-03	2.12E-03	1.48E-03	5.03E-04
W Wardlow from Alameda to I-710	1.30	25	3013	0.093	0.81	1.96E-02	1.38E-02	4.45E-03	3.10E-03	1.05E-03

Table B-21
2015 Alternative 2
Maximum Hourly Auto Emissions

	Length (mi)	Congst Speed mph	SCAG Gasoline vehicles	SCAG Gasoline TOG	SCAG Gasoline TOG	Max Hourly Toxics from Autos				
						Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
						71432	50000	106990	75070	107028
2015, Alternative 2			vph	g/veh-mi	lb/hour	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	0.65	55	2851	0.058	0.238	5.80E-03	4.07E-03	1.32E-03	9.17E-04	3.12E-04
Henry Ford Ramps	0.24	20	1008	0.119	0.063	1.55E-03	1.09E-03	3.51E-04	2.44E-04	8.31E-05
Henry Ford n/o Ramps to Alameda	0.68	20	1205	0.119	0.215	5.23E-03	3.68E-03	1.19E-03	8.28E-04	2.82E-04
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.04	50	1843	0.056	0.238	5.79E-03	4.06E-03	1.31E-03	9.15E-04	3.11E-04
SR-103 Anaheim to PCH	0.57	50	2947	0.056	0.208	5.07E-03	3.56E-03	1.15E-03	8.02E-04	2.73E-04
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	0.47	50	3461	0.056	0.202	4.91E-03	3.45E-03	1.12E-03	7.76E-04	2.64E-04
SR-103 Ramps south of Sepulveda/Willow		50	2007							
NB Sepulveda Ramp (G2 Line)	0.36	50	1204.2	0.056	0.054	1.31E-03	9.19E-04	2.97E-04	2.07E-04	7.04E-05
SB Sepulveda Ramp (F2 Ramp)	0.38	50	802.8	0.056	0.038	9.21E-04	6.47E-04	2.09E-04	1.46E-04	4.95E-05
SR-103 Existing, End Ramps to Sepulveda/Willow		50								
SB Sepulveda Ramp Traffic	0.07	50	802.8	0.056	0.007	1.70E-04	1.19E-04	3.85E-05	2.68E-05	9.13E-06
SB+NB Sepulveda Ramp Traffic	0.11	50	2007	0.056	0.027	6.66E-04	4.68E-04	1.51E-04	1.05E-04	3.59E-05
SR-103, Realignment to End (223rd/Wardlow)	1.85	50	1452	0.056	0.333	8.11E-03	5.69E-03	1.84E-03	1.28E-03	4.36E-04
E and W Harry Bridges, Figueroa to start Alameda	1.44	30	1247	0.076	0.302	7.36E-03	5.17E-03	1.67E-03	1.16E-03	3.96E-04
Alameda beginning (E Harry Bridges) to Anaheim	0.77	30	2292	0.076	0.296	7.21E-03	5.07E-03	1.64E-03	1.14E-03	3.88E-04
Alameda Anaheim to Henry Ford	0.42	30	1386	0.076	0.098	2.39E-03	1.68E-03	5.43E-04	3.78E-04	1.29E-04
Alameda, Henry Ford to PCH	0.34	30	1633	0.076	0.094	2.29E-03	1.61E-03	5.21E-04	3.63E-04	1.23E-04
Alameda PCH to 405	2.27	40	4330	0.060	1.302	3.17E-02	2.23E-02	7.20E-03	5.01E-03	1.71E-03
Alameda 405 to del Amo	1.72	40	4163	0.060	0.951	2.31E-02	1.63E-02	5.26E-03	3.66E-03	1.25E-03
Alameda, del Amo to South Santa Fe Avenue	0.84	40	3693	0.060	0.412	1.00E-02	7.04E-03	2.28E-03	1.59E-03	5.40E-04
Alameda, South Santa Fe Avenue to SR-91	1.15	40	2563	0.060	0.392	9.55E-03	6.71E-03	2.17E-03	1.51E-03	5.14E-04
I-110, "C" Street Interchange to Anaheim	0.49	45	10694	0.057	0.659	1.61E-02	1.13E-02	3.65E-03	2.54E-03	8.64E-04
I-110, Anaheim to PCH	0.80	45	10779	0.057	1.085	2.64E-02	1.86E-02	6.00E-03	4.18E-03	1.42E-03
1-110, PCH to Sepulveda	1.39	45	12630	0.057	2.195	5.34E-02	3.75E-02	1.21E-02	8.45E-03	2.88E-03
I-110, Sepulveda to Carson	1.56	45	13870	0.057	2.708	6.59E-02	4.63E-02	1.50E-02	1.04E-02	3.55E-03
I-110, Carson to Del Amo	1.02	45	15655	0.057	2.005	4.88E-02	3.43E-02	1.11E-02	7.72E-03	2.63E-03
I-110, Del Amo to 405	0.74	45	16754	0.057	1.556	3.79E-02	2.66E-02	8.61E-03	5.99E-03	2.04E-03
I-110, 405 to SR-91	1.09	45	19227	0.057	2.634	6.41E-02	4.50E-02	1.46E-02	1.01E-02	3.45E-03
I-710, Anaheim to PCH	0.50	40	8677	0.060	0.575	1.40E-02	9.83E-03	3.18E-03	2.21E-03	7.53E-04
I-710, PCH to Willow	1.01	40	9520	0.060	1.270	3.09E-02	2.17E-02	7.02E-03	4.89E-03	1.66E-03
I-710, Willow to 405	1.52	40	10074	0.060	2.036	4.96E-02	3.48E-02	1.13E-02	7.84E-03	2.67E-03
I-710, 405 to Del Amo	1.42	40	13416	0.060	2.527	6.15E-02	4.32E-02	1.40E-02	9.73E-03	3.31E-03
I-710, Del Amo to Long Beach Blvd Interchange	1.17	40	13300	0.060	2.072	5.04E-02	3.54E-02	1.15E-02	7.98E-03	2.71E-03
I-710, Long Beach Boulevard to SR-91	0.96	40	16483	0.060	2.102	5.12E-02	3.59E-02	1.16E-02	8.09E-03	2.75E-03
PCH, I-110 to Alameda	2.38	20	3956	0.119	2.469	6.01E-02	4.22E-02	1.37E-02	9.51E-03	3.23E-03
PCH, Alameda to SR-103	0.94	20	2307	0.119	0.570	1.39E-02	9.74E-03	3.15E-03	2.19E-03	7.47E-04
PCH, SR-103 to I-710	0.98	20	2380	0.119	0.613	1.49E-02	1.05E-02	3.39E-03	2.36E-03	8.03E-04
Sepulveda, I-110 to Avalon	1.37	25	1853	0.093	0.521	1.27E-02	8.92E-03	2.88E-03	2.01E-03	6.83E-04
Sepulveda, Avalon to Alameda	1.70	25	1777	0.093	0.621	1.51E-02	1.06E-02	3.43E-03	2.39E-03	8.13E-04
Sepulveda, Alameda to ICTF	0.67	25	1186	0.093	0.164	4.00E-03	2.81E-03	9.09E-04	6.33E-04	2.15E-04
Sepulveda, ICTF to SR-103	0.17	25	919	0.093	0.032	7.88E-04	5.54E-04	1.79E-04	1.25E-04	4.24E-05
Del Amo, I-110 to Wilmington	2.96	25	1711	0.093	1.041	2.53E-02	1.78E-02	5.76E-03	4.01E-03	1.36E-03
Del Amo, Wilminton to Alameda	0.77	25	2966	0.093	0.467	1.14E-02	7.98E-03	2.58E-03	1.80E-03	6.11E-04
Del Amo, Alameda to I-710	0.87	25	3895	0.093	0.698	1.70E-02	1.19E-02	3.86E-03	2.69E-03	9.15E-04
223rd Street, I-110 to Avalon	1.36	25	2131	0.093	0.597	1.45E-02	1.02E-02	3.30E-03	2.30E-03	7.82E-04
223rd Street, Avalon to Wilmington	1.23	25	1665	0.093	0.419	1.02E-02	7.17E-03	2.32E-03	1.61E-03	5.49E-04
223rd Street, Wilmington to Alameda	0.79	25	2323	0.093	0.377	9.17E-03	6.44E-03	2.08E-03	1.45E-03	4.94E-04
W Wardlow from Alameda to I-710	1.30	25	1716	0.093	0.459	1.12E-02	7.84E-03	2.54E-03	1.77E-03	6.01E-04

Table B-22
2030 No Build
Maximum Hourly Auto Emissions

	Length (mi)	Congst Speed mph	SCAG Gasoline vehicles	SCAG Gasoline TOG	SCAG Gasoline TOG	Max Hourly Toxics from Autos				
						Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
						71432	50000	106990	75070	107028
Baseline 2030			vph	g/veh-mi	lb/hour	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	0.75	40	2764	0.018	0.082	1.72E-03	1.11E-03	3.81E-04	2.00E-04	9.24E-05
Henry Ford Ramps	0.15	10	1147	0.078	0.030	6.30E-04	4.07E-04	1.39E-04	7.33E-05	3.38E-05
Henry Ford n/o Ramps to Alameda	0.68	10	1536	0.078	0.181	3.81E-03	2.46E-03	8.43E-04	4.43E-04	2.04E-04
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	0.95	40	1617	0.018	0.061	1.28E-03	8.27E-04	2.83E-04	1.49E-04	6.87E-05
SR-103 Anaheim to PCH	0.57	40	2303	0.018	0.052	1.10E-03	7.13E-04	2.44E-04	1.28E-04	5.92E-05
SR-103 PCH to Sepulveda/Willow	1.02	40	1991	0.018	0.080	1.70E-03	1.09E-03	3.75E-04	1.97E-04	9.09E-05
E and W Harry Bridges, Figueroa to start Alameda	1.44	25	2419	0.030	0.231	4.87E-03	3.14E-03	1.08E-03	5.66E-04	2.61E-04
Alameda beginning (E Harry Bridges) to Anaheim	0.77	25	2679	0.030	0.136	2.88E-03	1.86E-03	6.35E-04	3.34E-04	1.54E-04
Alameda Anaheim to Henry Ford	0.42	25	1716	0.030	0.048	1.01E-03	6.51E-04	2.23E-04	1.17E-04	5.41E-05
Alameda Henry Ford to PCH	0.34	25	1680	0.030	0.038	8.05E-04	5.19E-04	1.78E-04	9.35E-05	4.31E-05
Alameda PCH to 405	2.27	30	5061	0.024	0.607	1.28E-02	8.25E-03	2.83E-03	1.49E-03	6.86E-04
Alameda 405 to del Amo	1.72	30	4748	0.024	0.432	9.11E-03	5.88E-03	2.01E-03	1.06E-03	4.89E-04
Alameda, del Amo to South Santa Fe Avenue	0.84	30	4099	0.024	0.182	3.84E-03	2.48E-03	8.49E-04	4.47E-04	2.06E-04
Alameda, South Santa Fe Avenue to SR-91	1.15	30	2736	0.024	0.167	3.52E-03	2.27E-03	7.78E-04	4.09E-04	1.89E-04
I-110, "C" Street Interchange to Anaheim	0.49	45	12472	0.017	0.230	4.85E-03	3.13E-03	1.07E-03	5.63E-04	2.60E-04
I-110, Anaheim to PCH	0.80	45	12023	0.017	0.362	7.63E-03	4.92E-03	1.69E-03	8.87E-04	4.09E-04
1-110, PCH to Sepulveda	1.39	45	13691	0.017	0.711	1.50E-02	9.67E-03	3.31E-03	1.74E-03	8.04E-04
I-110, Sepulveda to Carson	1.56	45	15596	0.017	0.910	1.92E-02	1.24E-02	4.24E-03	2.23E-03	1.03E-03
I-110, Carson to Del Amo	1.02	45	16525	0.017	0.633	1.33E-02	8.61E-03	2.95E-03	1.55E-03	7.15E-04
I-110, Del Amo to 405	0.74	45	17586	0.017	0.488	1.03E-02	6.64E-03	2.28E-03	1.20E-03	5.52E-04
I-110, 405 to SR-91	1.09	45	20150	0.017	0.825	1.74E-02	1.12E-02	3.85E-03	2.02E-03	9.33E-04
I-710, Anaheim to PCH	0.50	40	8685	0.018	0.172	3.63E-03	2.34E-03	8.02E-04	4.22E-04	1.95E-04
I-710, PCH to Willow	1.01	40	8909	0.018	0.355	7.49E-03	4.83E-03	1.66E-03	8.71E-04	4.02E-04
I-710, Willow to 405	1.52	40	11937	0.018	0.722	1.52E-02	9.81E-03	3.36E-03	1.77E-03	8.15E-04
I-710, 405 to Del Amo	1.42	40	12881	0.018	0.726	1.53E-02	9.87E-03	3.38E-03	1.78E-03	8.20E-04
I-710, Del Amo to Long Beach Blvd Interchange	1.17	40	12683	0.018	0.591	1.25E-02	8.04E-03	2.75E-03	1.45E-03	6.68E-04
I-710, Long Beach Boulevard to SR-91	0.96	40	16820	0.018	0.641	1.35E-02	8.72E-03	2.99E-03	1.57E-03	7.25E-04
PCH, I110 to Alameda	2.38	20	4927	0.039	1.008	2.12E-02	1.37E-02	4.70E-03	2.47E-03	1.14E-03
PCH, Alameda to SR-103	0.94	20	2842	0.039	0.230	4.85E-03	3.13E-03	1.07E-03	5.64E-04	2.60E-04
PCH, SR-103 to I-710	0.98	20	2245	0.039	0.189	3.99E-03	2.58E-03	8.83E-04	4.64E-04	2.14E-04
Sepulveda, I-110 to Avalon	1.37	25	2213	0.030	0.200	4.22E-03	2.73E-03	9.34E-04	4.91E-04	2.26E-04
Sepulveda, Avalon to Alameda	1.70	25	2375	0.030	0.267	5.63E-03	3.63E-03	1.24E-03	6.54E-04	3.02E-04
Sepulveda, Alameda to ICTF	0.67	25	1086	0.030	0.048	1.02E-03	6.59E-04	2.26E-04	1.19E-04	5.47E-05
Sepulveda, ICTF to SR-103	0.17	25	822	0.030	0.009	1.96E-04	1.27E-04	4.34E-05	2.28E-05	1.05E-05
Del Amo, I-110 to Wilmington	2.96	25	2480	0.030	0.485	1.02E-02	6.60E-03	2.26E-03	1.19E-03	5.48E-04
Del Amo, Wilminton to Alameda	0.77	25	3223	0.030	0.163	3.44E-03	2.22E-03	7.60E-04	4.00E-04	1.84E-04
Del Amo, Alameda to I-710	0.87	25	2645	0.030	0.153	3.22E-03	2.07E-03	7.11E-04	3.74E-04	1.72E-04
223rd Street, I-110 to Avalon	1.36	25	2423	0.030	0.218	4.60E-03	2.97E-03	1.02E-03	5.35E-04	2.47E-04
223rd Street, Avalon to Wilmington	1.23	25	2144	0.030	0.174	3.66E-03	2.36E-03	8.10E-04	4.26E-04	1.96E-04
223rd Street, Wilmington to Alameda	0.79	25	2590	0.030	0.135	2.85E-03	1.84E-03	6.30E-04	3.31E-04	1.53E-04
W Wardlow from Alameda to I-710	1.30	25	3727	0.030	0.320	6.75E-03	4.36E-03	1.49E-03	7.85E-04	3.62E-04

Table B-23
2030 Alternative 1
Maximum Hourly Auto Emissions

	Length (mi)	Congst Speed mph	SCAG Gasoline vehicles	SCAG Gasoline TOG	SCAG Gasoline TOG	Max Hourly Toxics from Autos				
						Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
						71432	50000	106990	75070	107028
Alternative 1, 2030			vph	g/veh-mi	lb/hour	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to Transition		50	3853							
New Dock Ramps - Cerritos Channel (A1 Line)	0.24	50	3853	0.017	0.035	7.31E-04	4.71E-04	1.61E-04	8.49E-05	3.92E-05
SB Cerritos Channel - Transition (G1 Line)	0.13	50	1926.5	0.017	0.009	1.98E-04	1.28E-04	4.37E-05	2.30E-05	1.06E-05
NB Cerritos Channel - Transition (E1 Line)	0.15	50	1926.5	0.017	0.011	2.28E-04	1.47E-04	5.05E-05	2.65E-05	1.22E-05
Mainline Transition to HF Ramps & SR-103		50	2724							
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	0.23	50	1362	0.017	0.012	2.47E-04	1.60E-04	5.47E-05	2.88E-05	1.33E-05
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	0.20	50	1362	0.017	0.010	2.15E-04	1.39E-04	4.76E-05	2.50E-05	1.15E-05
Henry Ford Ramps	0.31	20	959	0.039	0.026	5.39E-04	3.48E-04	1.19E-04	6.26E-05	2.89E-05
Henry Ford n/o Ramps to Alameda	0.68	20	1427	0.039	0.083	1.76E-03	1.13E-03	3.89E-04	2.04E-04	9.43E-05
SR-47 Extension, HF Ramps to Alameda		50	1129							
SB, 103 Split to Dominguex Channel (D1 Line)	0.70	50	564.5	0.017	0.015	3.12E-04	2.01E-04	6.90E-05	3.63E-05	1.67E-05
NB, 103 Split to Dominguex Channel (F1 Line)	0.69	50	564.5	0.017	0.015	3.08E-04	1.99E-04	6.80E-05	3.58E-05	1.65E-05
Dominguex Channel - Alameda (I1 Line)	0.83	50	1129	0.017	0.035	7.40E-04	4.78E-04	1.64E-04	8.60E-05	3.97E-05
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.10	50	1765	0.017	0.073	1.53E-03	9.90E-04	3.39E-04	1.78E-04	8.22E-05
SR-103 Anaheim to PCH	0.57	50	2831	0.017	0.060	1.27E-03	8.23E-04	2.82E-04	1.48E-04	6.83E-05
SR-103 PCH to Sepulveda/Willow	1.02	50	2771	0.017	0.106	2.23E-03	1.44E-03	4.94E-04	2.60E-04	1.20E-04
E and W Harry Bridges, Figueroa to start Alameda	1.44	35	2315	0.020	0.147	3.11E-03	2.00E-03	6.86E-04	3.61E-04	1.66E-04
Alameda beginning (E Harry Bridges) to Anaheim	0.77	35	2903	0.020	0.099	2.08E-03	1.34E-03	4.59E-04	2.41E-04	1.11E-04
Alameda Anaheim to Henry Ford	0.42	35	1829	0.020	0.034	7.17E-04	4.63E-04	1.58E-04	8.34E-05	3.84E-05
Alameda, Henry Ford to PCH	0.34	35	1833	0.020	0.028	5.85E-04	3.78E-04	1.29E-04	6.80E-05	3.14E-05
Alameda PCH to 405	2.27	30	4573	0.024	0.548	1.16E-02	7.46E-03	2.56E-03	1.34E-03	6.20E-04
Alameda 405 to del Amo	1.72	35	4346	0.020	0.330	6.95E-03	4.49E-03	1.54E-03	8.08E-04	3.73E-04
Alameda, del Amo to South Santa Fe Avenue	0.84	35	3722	0.020	0.138	2.91E-03	1.88E-03	6.43E-04	3.38E-04	1.56E-04
Alameda, South Santa Fe Avenue to SR-91	1.15	35	2625	0.020	0.133	2.81E-03	1.82E-03	6.22E-04	3.27E-04	1.51E-04
I-110, "C" Street Interchange to Anaheim	0.49	45	11927	0.017	0.220	4.63E-03	2.99E-03	1.02E-03	5.39E-04	2.48E-04
I-110, Anaheim to PCH	0.80	45	11931	0.017	0.359	7.57E-03	4.88E-03	1.67E-03	8.80E-04	4.06E-04
1-110, PCH to Sepulveda	1.39	45	13668	0.017	0.710	1.50E-02	9.66E-03	3.31E-03	1.74E-03	8.02E-04
I-110, Sepulveda to Carson	1.56	45	15129	0.017	0.883	1.86E-02	1.20E-02	4.11E-03	2.16E-03	9.98E-04
I-110, Carson to Del Amo	1.02	45	16565	0.017	0.634	1.34E-02	8.63E-03	2.96E-03	1.55E-03	7.17E-04
I-110, Del Amo to 405	0.74	45	17593	0.017	0.489	1.03E-02	6.64E-03	2.28E-03	1.20E-03	5.52E-04
I-110, 405 to SR-91	1.09	45	20255	0.017	0.830	1.75E-02	1.13E-02	3.87E-03	2.03E-03	9.38E-04
I-710, Anaheim to PCH	0.50	40	8711	0.018	0.173	3.64E-03	2.35E-03	8.04E-04	4.23E-04	1.95E-04
I-710, PCH to Willow	1.01	40	9038	0.018	0.361	7.60E-03	4.90E-03	1.68E-03	8.83E-04	4.07E-04
I-710, Willow to 405	1.52	40	9730	0.018	0.588	1.24E-02	8.00E-03	2.74E-03	1.44E-03	6.65E-04
I-710, 405 to Del Amo	1.42	40	13402	0.018	0.755	1.59E-02	1.03E-02	3.52E-03	1.85E-03	8.53E-04
I-710, Del Amo to Long Beach Blvd Interchange	1.17	40	13107	0.018	0.611	1.29E-02	8.31E-03	2.84E-03	1.50E-03	6.90E-04
I-710, Long Beach Boulevard to SR-91	0.96	40	17148	0.018	0.654	1.38E-02	8.89E-03	3.05E-03	1.60E-03	7.39E-04
PCH, I110 to Alameda	2.38	20	4769	0.039	0.975	2.06E-02	1.33E-02	4.54E-03	2.39E-03	1.10E-03
PCH, Alameda to SR-103	0.94	20	2861	0.039	0.232	4.88E-03	3.15E-03	1.08E-03	5.67E-04	2.62E-04
PCH, SR-103 to I-710	0.98	20	2242	0.039	0.189	3.99E-03	2.57E-03	8.82E-04	4.64E-04	2.14E-04
Sepulveda, I-110 to Avalon	1.37	25	2254	0.030	0.204	4.30E-03	2.78E-03	9.51E-04	5.00E-04	2.31E-04
Sepulveda, Avalon to Alameda	1.70	25	2457	0.030	0.276	5.82E-03	3.75E-03	1.29E-03	6.76E-04	3.12E-04
Sepulveda, Alameda to ICTF	0.67	25	1279	0.030	0.057	1.20E-03	7.76E-04	2.66E-04	1.40E-04	6.45E-05
Sepulveda, ICTF to SR-103	0.17	25	993	0.030	0.011	2.37E-04	1.53E-04	5.24E-05	2.76E-05	1.27E-05
Del Amo, I-110 to Wilmington	2.96	25	2431	0.030	0.476	1.00E-02	6.47E-03	2.22E-03	1.17E-03	5.38E-04
Del Amo, Wilminton to Alameda	0.77	25	3084	0.030	0.156	3.29E-03	2.12E-03	7.27E-04	3.83E-04	1.76E-04
Del Amo, Alameda to I-710	0.87	25	4263	0.030	0.246	5.18E-03	3.34E-03	1.15E-03	6.02E-04	2.78E-04
223rd Street, I-110 to Avalon	1.36	25	2408	0.030	0.217	4.58E-03	2.95E-03	1.01E-03	5.32E-04	2.45E-04
223rd Street, Avalon to Wilmington	1.23	25	2188	0.030	0.177	3.74E-03	2.41E-03	8.26E-04	4.34E-04	2.00E-04
223rd Street, Wilmington to Alameda	0.79	25	2723	0.030	0.142	3.00E-03	1.93E-03	6.62E-04	3.48E-04	1.61E-04
W Wardlow from Alameda to I-710	1.30	25	3545	0.030	0.305	6.42E-03	4.14E-03	1.42E-03	7.47E-04	3.44E-04

Table B-24
2030 Alternative 2
Maximum Hourly Auto Emissions

	Length (mi)	Congst Speed mph	SCAG Gasoline vehicles	SCAG Gasoline TOG	SCAG Gasoline TOG	Max Hourly Toxics from Autos				
						Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
						71432	50000	106990	75070	107028
2030 Alternative 2			vph	g/veh-mi	lb/hour	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SR-47 Mainline, New Dock Ramps to HF Ramps	0.65	50	3395	0.017	0.08	1.74E-03	1.12E-03	3.85E-04	2.03E-04	9.35E-05
Henry Ford Ramps	0.24	15	1246	0.054	0.04	7.50E-04	4.84E-04	1.66E-04	8.72E-05	4.02E-05
Henry Ford n/o Ramps to Alameda	0.68	15	1636	0.054	0.13	2.79E-03	1.80E-03	6.17E-04	3.24E-04	1.50E-04
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.04	45	2148	0.017	0.08	1.76E-03	1.14E-03	3.90E-04	2.05E-04	9.46E-05
SR-103 Anaheim to PCH	0.57	45	3171	0.017	0.07	1.43E-03	9.21E-04	3.16E-04	1.66E-04	7.65E-05
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	0.47	45	3349	0.017	0.06	1.24E-03	8.02E-04	2.75E-04	1.45E-04	6.67E-05
SR-103 Ramps south of Sepulveda/Willow		55	2094							
NB Sepulveda Ramp (G2 Line)	0.36	55	1256.4	0.017	0.02	3.57E-04	2.31E-04	7.90E-05	4.15E-05	1.92E-05
SB Sepulveda Ramp (F2 Ramp)	0.38	55	837.6	0.017	0.01	2.51E-04	1.62E-04	5.56E-05	2.92E-05	1.35E-05
SR-103 Existing, End Ramps to Sepulveda/Willow		55								
SB Sepulveda Ramp Traffic	0.07	55	837.6	0.017	0.00	4.63E-05	2.99E-05	1.02E-05	5.38E-06	2.48E-06
SB+NB Sepulveda Ramp Traffic	0.11	55	2094	0.017	0.01	1.82E-04	1.17E-04	4.02E-05	2.12E-05	9.76E-06
SR-103, Realignment to End (223rd/Wardlow)	1.85	45	1254	0.017	0.09	1.83E-03	1.18E-03	4.05E-04	2.13E-04	9.83E-05
E and W Harry Bridges, Figueroa to start Alameda	1.44	30	1942	0.024	0.15	3.13E-03	2.02E-03	6.91E-04	3.63E-04	1.68E-04
Alameda beginning (E Harry Bridges) to Anaheim	0.77	30	2787	0.024	0.11	2.39E-03	1.54E-03	5.29E-04	2.78E-04	1.28E-04
Alameda Anaheim to Henry Ford	0.42	30	1729	0.024	0.04	8.14E-04	5.25E-04	1.80E-04	9.46E-05	4.36E-05
Alameda, Henry Ford to PCH	0.34	30	1930	0.024	0.04	7.40E-04	4.77E-04	1.63E-04	8.60E-05	3.97E-05
Alameda PCH to 405	2.27	40	4886	0.018	0.44	9.26E-03	5.98E-03	2.05E-03	1.08E-03	4.97E-04
Alameda 405 to del Amo	1.72	35	4289	0.020	0.33	6.86E-03	4.43E-03	1.52E-03	7.97E-04	3.68E-04
Alameda, del Amo to South Santa Fe Avenue	0.84	35	3693	0.020	0.14	2.89E-03	1.86E-03	6.38E-04	3.35E-04	1.55E-04
Alameda, South Santa Fe Avenue to SR-91	1.15	35	2529	0.020	0.13	2.71E-03	1.75E-03	5.99E-04	3.15E-04	1.45E-04
I-110, "C" Street Interchange to Anaheim	0.49	45	12095	0.017	0.22	4.70E-03	3.03E-03	1.04E-03	5.46E-04	2.52E-04
I-110, Anaheim to PCH	0.80	45	11913	0.017	0.36	7.56E-03	4.88E-03	1.67E-03	8.79E-04	4.05E-04
1-110, PCH to Sepulveda	1.39	45	13642	0.017	0.71	1.49E-02	9.64E-03	3.30E-03	1.74E-03	8.01E-04
I-110, Sepulveda to Carson	1.56	45	15583	0.017	0.91	1.92E-02	1.24E-02	4.24E-03	2.23E-03	1.03E-03
I-110, Carson to Del Amo	1.02	45	16654	0.017	0.64	1.34E-02	8.67E-03	2.97E-03	1.56E-03	7.21E-04
I-110, Del Amo to 405	0.74	45	17704	0.017	0.49	1.04E-02	6.69E-03	2.29E-03	1.20E-03	5.56E-04
I-110, 405 to SR-91	1.09	45	20331	0.017	0.83	1.76E-02	1.13E-02	3.88E-03	2.04E-03	9.41E-04
I-710, Anaheim to PCH	0.50	40	8890	0.018	0.18	3.71E-03	2.40E-03	8.21E-04	4.32E-04	1.99E-04
I-710, PCH to Willow	1.01	40	9155	0.018	0.37	7.70E-03	4.97E-03	1.70E-03	8.95E-04	4.13E-04
I-710, Willow to 405	1.52	40	9798	0.018	0.59	1.25E-02	8.05E-03	2.76E-03	1.45E-03	6.69E-04
I-710, 405 to Del Amo	1.42	40	13529	0.018	0.76	1.61E-02	1.04E-02	3.55E-03	1.87E-03	8.61E-04
I-710, Del Amo to Long Beach Blvd Interchange	1.17	40	13140	0.018	0.61	1.29E-02	8.33E-03	2.85E-03	1.50E-03	6.92E-04
I-710, Long Beach Boulevard to SR-91	0.96	40	17144	0.018	0.65	1.38E-02	8.89E-03	3.05E-03	1.60E-03	7.39E-04
PCH, I-110 to Alameda	2.38	20	4832	0.039	0.99	2.08E-02	1.34E-02	4.60E-03	2.42E-03	1.12E-03
PCH, Alameda to SR-103	0.94	20	2730	0.039	0.22	4.66E-03	3.01E-03	1.03E-03	5.41E-04	2.50E-04
PCH, SR-103 to I-710	0.98	20	2415	0.039	0.20	4.30E-03	2.77E-03	9.50E-04	4.99E-04	2.30E-04
Sepulveda, I-110 to Avalon	1.37	25	2202	0.030	0.20	4.20E-03	2.71E-03	9.29E-04	4.89E-04	2.25E-04
Sepulveda, Avalon to Alameda	1.70	25	2395	0.030	0.27	5.67E-03	3.66E-03	1.25E-03	6.59E-04	3.04E-04
Sepulveda, Alameda to ICTF	0.67	25	1318	0.030	0.06	1.24E-03	8.00E-04	2.74E-04	1.44E-04	6.64E-05
Sepulveda, ICTF to SR-103	0.17	25	1027	0.030	0.01	2.45E-04	1.58E-04	5.42E-05	2.85E-05	1.32E-05
Del Amo, I-110 to Wilmington	2.96	25	2517	0.030	0.49	1.04E-02	6.70E-03	2.29E-03	1.21E-03	5.57E-04
Del Amo, Wilminton to Alameda	0.77	25	3194	0.030	0.16	3.41E-03	2.20E-03	7.53E-04	3.96E-04	1.83E-04
Del Amo, Alameda to I-710	0.87	25	4233	0.030	0.24	5.15E-03	3.32E-03	1.14E-03	5.98E-04	2.76E-04
223rd Street, I-110 to Avalon	1.36	25	2373	0.030	0.21	4.51E-03	2.91E-03	9.97E-04	5.24E-04	2.42E-04
223rd Street, Avalon to Wilmington	1.23	25	2110	0.030	0.17	3.60E-03	2.33E-03	7.97E-04	4.19E-04	1.93E-04
223rd Street, Wilmington to Alameda	0.79	25	2619	0.030	0.14	2.88E-03	1.86E-03	6.37E-04	3.35E-04	1.54E-04
W Wardlow from Alameda to I-710	1.30	25	3664	0.030	0.31	6.64E-03	4.28E-03	1.47E-03	7.72E-04	3.56E-04

Table B-25
70-year Average Baseline
Truck Emissions

	Total Average Annual Toxic Emissions from Trucks																	
Average Baseline Emissions (2003-2073)	DPM	Acetaldehyde	Acrolein	Benzene	Bromine	1,3-Butadiene	Chlorine	Chromium	Copper	Formaldehyde	n-Hexane	Manganese	Nickel	Propylene	Sulfates	Toluene	Xylenes	Zinc
Averaged over 70-years	9901	75070	107028	71432	7726956	106990	7782505	18540299	7440508	50000	110543	7439965	7440020	115071	9960	108883	1210	7440666
BASELINE	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to HF Ramps	1,162	0.54	0.010	2.04	0.18	0.04	24.69	0.009	0.18	13.74	0.34	0.18	0.18	28.38	158.74	0.67	0.34	0.176
Henry Ford Ramps	91.5	0.1	0.000	0.20	0.02	0.00	2.64	0.001	0.02	1.45	0.04	0.02	0.02	3.03	16.97	0.07	0.04	0.02
Henry Ford n/o Ramps to Alameda	516.6	0.4	0.040	1.75	0.10	0.17	13.44	0.005	0.10	7.95	0.18	0.10	0.10	15.44	86.37	0.37	0.18	0.10
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	937.9	0.3	0.013	1.35	0.11	0.06	14.89	0.005	0.11	8.38	0.20	0.11	0.11	17.11	95.69	0.40	0.20	0.11
SR-103 Anaheim to PCH	575.8	0.2	0.010	0.95	0.07	0.04	10.22	0.004	0.07	5.77	0.14	0.07	0.07	11.75	65.72	0.28	0.14	0.07
SR-103 PCH to Sepulveda/Willow	707.7	0.3	0.018	1.10	0.07	0.08	10.15	0.004	0.07	5.84	0.14	0.07	0.07	11.67	65.26	0.28	0.14	0.07
E and W Harry Bridges, Figueroa to start Alameda	505.5	0.5	0.040	1.91	0.11	0.17	15.67	0.006	0.11	9.18	0.21	0.11	0.11	18.01	100.76	0.43	0.21	0.11
Alameda beginning (E Harry Bridges) to Anaheim	311.5	0.3	0.044	1.53	0.07	0.19	9.64	0.003	0.07	5.90	0.13	0.07	0.07	11.08	61.96	0.26	0.13	0.07
Alameda Anaheim to Henry Ford	106.3	0.1	0.022	0.67	0.02	0.10	3.41	0.001	0.02	2.18	0.05	0.02	0.02	3.92	21.92	0.09	0.05	0.02
Alameda Henry Ford to PCH	282.9	0.3	0.027	1.15	0.06	0.11	8.70	0.003	0.06	5.16	0.12	0.06	0.06	10.00	55.93	0.24	0.12	0.06
Alameda PCH to 405	2,062.2	2.9	0.525	13.98	0.41	2.25	56.73	0.020	0.41	38.44	0.77	0.41	0.41	65.19	364.68	1.54	0.77	0.41
Alameda 405 to del Amo	899.2	1.2	0.225	5.86	0.16	0.96	22.57	0.008	0.16	15.48	0.31	0.16	0.16	25.93	145.08	0.61	0.31	0.16
Alameda, Del Amo to South Santa Fe Avenue	294.2	0.4	0.084	2.04	0.05	0.36	6.57	0.002	0.05	4.76	0.09	0.05	0.05	7.55	42.25	0.18	0.09	0.05
Alameda, South Santa Fe Ave to SR-91	312.9	0.8	0.177	3.93	0.06	0.76	8.52	0.003	0.06	7.14	0.12	0.06	0.06	9.80	54.79	0.23	0.12	0.06
I-110, "C" Street Interchange to Anaheim	1,058.9	0.7	0.113	3.30	0.11	0.48	16.06	0.006	0.11	10.38	0.22	0.11	0.11	18.46	103.26	0.44	0.22	0.11
I-110, Anaheim to PCH	1,757.1	1.2	0.209	5.88	0.19	0.89	26.79	0.010	0.19	17.59	0.36	0.19	0.19	30.79	172.22	0.73	0.36	0.19
1-110, PCH to Sepulveda	3,159.1	2.7	0.512	13.07	0.34	2.18	47.72	0.017	0.34	33.23	0.65	0.34	0.34	54.84	306.75	1.30	0.65	0.34
I-110, Sepulveda to Carson	3,509.4	3.5	0.768	17.99	0.36	3.28	49.90	0.018	0.36	37.88	0.68	0.36	0.36	57.34	320.75	1.36	0.68	0.36
I-110, Carson to Del Amo	2,259.9	2.6	0.581	13.15	0.23	2.48	31.60	0.011	0.23	25.29	0.43	0.23	0.23	36.32	203.16	0.86	0.43	0.23
I-110, Del Amo to 405	1,642.2	1.9	0.458	9.90	0.13	1.96	18.65	0.007	0.13	16.49	0.25	0.13	0.13	21.43	119.86	0.51	0.25	0.13
I-110, 405 to SR-91	2,317.9	3.7	0.967	19.85	0.18	4.13	25.46	0.009	0.18	27.13	0.35	0.18	0.18	29.26	163.68	0.69	0.35	0.18
I-710, Anaheim to PCH	3,080.6	1.5	0.156	6.54	0.35	0.67	48.65	0.017	0.35	28.92	0.66	0.35	0.35	55.91	312.78	1.32	0.66	0.35
I-710, PCH to Willow	6,464.5	3.3	0.373	14.59	0.73	1.60	102.50	0.037	0.73	61.54	1.39	0.73	0.73	117.80	658.93	2.79	1.39	0.73
I-710, Willow to 405	9,772.6	5.1	0.585	22.41	1.10	2.50	154.51	0.055	1.10	93.08	2.10	1.10	1.10	177.57	993.31	4.20	2.10	1.10
I-710, 405 to Del Amo	8,616.5	5.5	0.837	25.59	0.96	3.58	134.49	0.048	0.96	85.48	1.83	0.96	0.96	154.55	864.55	3.66	1.83	0.96
I-710, Del Amo to Long Beach Blvd Interchange	6,982.5	4.7	0.756	22.17	0.78	3.23	108.77	0.039	0.78	70.21	1.48	0.78	0.78	125.00	699.25	2.96	1.48	0.78
I-710, Long Beach Boulevard to SR-91	5,734.7	4.1	0.684	19.27	0.63	2.92	87.84	0.031	0.63	57.67	1.19	0.63	0.63	100.95	564.68	2.39	1.19	0.63
PCH-110 to Alameda	607.4	1.0	0.229	5.00	0.07	0.98	10.00	0.004	0.07	8.60	0.14	0.07	0.07	11.49	64.26	0.27	0.14	0.07
PCH, Alameda to SR-103	130.4	0.2	0.035	0.80	0.01	0.15	1.94	0.001	0.01	1.55	0.03	0.01	0.01	2.22	12.44	0.05	0.03	0.01
PCH, SR-103 to I-710	1,094.3	0.5	0.085	2.49	0.09	0.36	12.22	0.004	0.09	7.89	0.17	0.09	0.09	14.04	78.53	0.33	0.17	0.09
Sepulveda, I-110 to Avalon	73.2	0.3	0.095	1.84	0.01	0.41	1.02	0.000	0.01	1.85	0.01	0.01	0.01	1.17	6.54	0.03	0.01	0.01
Sepulveda, Avalon to Alameda	101.1	0.4	0.114	2.16	0.01	0.48	0.73	0.000	0.01	1.94	0.01	0.01	0.01	0.84	4.69	0.02	0.01	0.01
Sepulveda, Alameda to ICTF	159.2	0.2	0.029	0.75	0.02	0.12	2.80	0.001	0.02	1.94	0.04	0.02	0.02	3.22	18.02	0.08	0.04	0.02
Sepulveda, ICTF to SR-103	120.3	0.1	0.007	0.26	0.01	0.03	1.71	0.001	0.01	1.04	0.02	0.01	0.01	1.96	10.98	0.05	0.02	0.01
Del Amo, I-110 to Wilmington	83.6	0.2	0.056	1.10	0.01	0.23	0.84	0.000	0.01	1.16	0.01	0.01	0.01	0.96	5.38	0.02	0.01	0.01
Del Amo, Wilmington to Alameda	93.4	0.4	0.109	2.21	0.02	0.46	2.54	0.001	0.02	2.87	0.03	0.02	0.02	2.92	16.34	0.07	0.03	0.02
Del Amo, Alameda to I-710	158.0	0.7	0.198	3.82	0.01	0.85	1.99	0.001	0.01	3.81	0.03	0.01	0.01	2.29	12.81	0.05	0.03	0.01
223rd Street, I-110 to Avalon	52.7	0.3	0.076	1.42	0.00	0.32	0.19	0.000	0.00	1.13	0.00	0.00	0.00	0.22	1.23	0.01	0.00	0.00
223rd Street, Avalon to Wilmington	41.6	0.2	0.062	1.16	0.00	0.26	0.16	0.000	0.00	0.93	0.00	0.00	0.00	0.18	1.02	0.00	0.00	0.00
223rd Street, Wilmington to Alameda	65.1	0.1	0.039	0.81	0.01	0.17	1.07	0.000	0.01	1.12	0.01	0.01	0.01	1.23	6.88	0.03	0.01	0.01
W Wardlow from Alameda to I-710	206.8	0.2	0.062	1.19	0.00	0.26	0.47	0.000	0.00	1.09	0.01	0.00	0.00	0.54	3.04	0.01	0.01	0.00

Table B-26
2003-2015 Emissions (70-year average)
Truck Emissions

	Total Average Annual Toxic Emissions from Trucks																	
Average Emissions (2003-2015)	DPM	Acetaldehyde	Acrolein	Benzene	Bromine	1,3-Butadiene	Chlorine	Chromium	Copper	Formaldehyde	n-Hexane	Manganese	Nickel	Propylene	Sulfates	Toluene	Xylenes	Zinc
Averaged Over 70-years	9901	75070	107028	71432	7726956	106990	7782505	18540299	7440508	50000	110543	7439965	7440020	115071	9960	108883	1210	7440666
PROJECT - ALT 1 & ALT 2	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to HF Ramps	585.41	0.08	0.009	0.36	0.01	0.04	1.83	0.0007	0.01	1.49	0.03	0.01	0.01	2.84	11.77	0.07	0.03	0.013
Henry Ford Ramps	56.0	0.0	0.000	0.02	0.00	0.00	0.20	0.0001	0.00	0.15	0.00	0.00	0.00	0.30	1.26	0.01	0.00	0.00
Henry Ford n/o Ramps to Alameda	296.7	0.2	0.037	0.79	0.01	0.16	1.00	0.0004	0.01	1.26	0.02	0.01	0.01	1.55	6.40	0.04	0.02	0.01
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	459.9	0.1	0.012	0.33	0.01	0.05	1.10	0.0004	0.01	0.98	0.02	0.01	0.01	1.71	7.09	0.04	0.02	0.01
SR-103 Anaheim to PCH	299.5	0.1	0.008	0.23	0.01	0.04	0.76	0.0003	0.01	0.68	0.01	0.01	0.01	1.18	4.87	0.03	0.01	0.01
SR-103 PCH to Sepulveda/Willow	383.2	0.1	0.015	0.35	0.01	0.06	0.75	0.0003	0.01	0.77	0.01	0.01	0.01	1.17	4.84	0.03	0.01	0.01
E and W Harry Bridges, Figueroa to start Alameda	304.4	0.1	0.032	0.72	0.01	0.14	1.16	0.0004	0.01	1.32	0.02	0.01	0.01	1.81	7.47	0.04	0.02	0.01
Alameda beginning (E Harry Bridges) to Anaheim	181.5	0.1	0.031	0.65	0.01	0.13	0.71	0.0003	0.01	0.96	0.01	0.01	0.01	1.11	4.59	0.03	0.01	0.01
Alameda Anaheim to Henry Ford	60.4	0.1	0.016	0.32	0.00	0.07	0.25	0.0001	0.00	0.41	0.00	0.00	0.00	0.39	1.62	0.01	0.00	0.00
Alameda Henry Ford to PCH	153.8	0.1	0.022	0.47	0.00	0.09	0.64	0.0002	0.00	0.78	0.01	0.00	0.00	1.00	4.15	0.02	0.01	0.00
Alameda PCH to 405	872.0	1.7	0.441	8.59	0.03	1.89	4.21	0.0015	0.03	9.26	0.08	0.03	0.03	6.53	27.04	0.15	0.08	0.03
Alameda 405 to del Amo	348.9	0.6	0.170	3.32	0.01	0.73	1.67	0.0006	0.01	3.60	0.03	0.01	0.01	2.60	10.76	0.06	0.03	0.01
Alameda, Del Amo to South Santa Fe Avenue	96.3	0.2	0.066	1.27	0.00	0.28	0.49	0.0002	0.00	1.28	0.01	0.00	0.00	0.76	3.13	0.02	0.01	0.00
Alameda, South Santa Fe Ave to SR-91	107.1	0.6	0.158	3.00	0.00	0.68	0.63	0.0002	0.00	2.67	0.01	0.00	0.00	0.98	4.06	0.02	0.01	0.00
I-110, "C" Street Interchange to Anaheim	553.5	0.3	0.087	1.73	0.01	0.37	1.19	0.0004	0.01	2.09	0.02	0.01	0.01	1.85	7.66	0.04	0.02	0.01
I-110, Anaheim to PCH	911.0	0.6	0.160	3.17	0.01	0.69	1.99	0.0007	0.01	3.70	0.04	0.01	0.01	3.09	12.77	0.07	0.04	0.01
1-110, PCH to Sepulveda	1,615.0	1.5	0.392	7.62	0.03	1.68	3.54	0.0013	0.03	8.06	0.07	0.03	0.03	5.50	22.74	0.13	0.07	0.03
I-110, Sepulveda to Carson	1,779.1	2.1	0.577	11.07	0.03	2.48	3.70	0.0013	0.03	10.75	0.07	0.03	0.03	5.75	23.78	0.14	0.07	0.03
I-110, Carson to Del Amo	1,149.9	1.6	0.443	8.46	0.02	1.91	2.34	0.0008	0.02	7.89	0.04	0.02	0.02	3.64	15.06	0.09	0.04	0.02
I-110, Del Amo to 405	818.3	1.3	0.352	6.67	0.01	1.51	1.38	0.0005	0.01	5.92	0.03	0.01	0.01	2.15	8.89	0.05	0.03	0.01
I-110, 405 to SR-91	1,156.7	2.6	0.731	13.75	0.01	3.14	1.89	0.0007	0.01	11.55	0.03	0.01	0.01	2.93	12.13	0.07	0.03	0.01
I-710, Anaheim to PCH	1,291.7	0.5	0.122	2.62	0.03	0.52	3.61	0.0013	0.03	4.37	0.07	0.03	0.03	5.60	23.19	0.13	0.07	0.03
I-710, PCH to Willow	2,831.6	1.3	0.295	6.25	0.05	1.27	7.60	0.0027	0.05	9.76	0.14	0.05	0.05	11.81	48.85	0.28	0.14	0.05
I-710, Willow to 405	4,290.0	2.0	0.465	9.78	0.08	2.00	11.45	0.0041	0.08	14.99	0.21	0.08	0.08	17.80	73.64	0.42	0.21	0.08
I-710, 405 to Del Amo	3,679.8	2.6	0.664	13.32	0.07	2.85	9.97	0.0036	0.07	16.64	0.18	0.07	0.07	15.49	64.09	0.37	0.18	0.07
I-710, Del Amo to Long Beach Blvd Interchange	2,964.2	2.3	0.599	11.92	0.06	2.58	8.06	0.0029	0.06	14.32	0.15	0.06	0.06	12.53	51.84	0.30	0.15	0.06
I-710, Long Beach Boulevard to SR-91	2,404.1	2.0	0.526	10.41	0.05	2.26	6.51	0.0023	0.05	12.15	0.12	0.05	0.05	10.12	41.86	0.24	0.12	0.05
PCH-110 to Alameda	297.5	0.6	0.170	3.24	0.01	0.73	0.74	0.0003	0.01	2.91	0.01	0.01	0.01	1.15	4.76	0.03	0.01	0.01
PCH, Alameda to SR-103	33.8	0.1	0.027	0.52	0.00	0.12	0.14	0.0001	0.00	0.49	0.00	0.00	0.00	0.22	0.92	0.01	0.00	0.00
PCH, SR-103 to I-710	397.4	0.3	0.071	1.41	0.01	0.30	0.91	0.0003	0.01	1.66	0.02	0.01	0.01	1.41	5.82	0.03	0.02	0.01
Sepulveda, I-110 to Avalon	32.7	0.3	0.073	1.37	0.00	0.32	0.08	0.0000	0.00	1.07	0.00	0.00	0.00	0.12	0.48	0.00	0.00	0.00
Sepulveda, Avalon to Alameda	44.6	0.3	0.087	1.63	0.00	0.38	0.05	0.0000	0.00	1.26	0.00	0.00	0.00	0.08	0.35	0.00	0.00	0.00
Sepulveda, Alameda to ICTF	63.2	0.1	0.024	0.47	0.00	0.10	0.21	0.0001	0.00	0.49	0.00	0.00	0.00	0.32	1.34	0.01	0.00	0.00
Sepulveda, ICTF to SR-103	65.5	0.0	0.006	0.13	0.00	0.03	0.13	0.0000	0.00	0.18	0.00	0.00	0.00	0.20	0.81	0.00	0.00	0.00
Del Amo, I-110 to Wilmington	6.0	0.0	0.013	0.25	0.00	0.05	0.06	0.0000	0.00	0.21	0.00	0.00	0.00	0.10	0.40	0.00	0.00	0.00
Del Amo, Wilmington to Alameda	30.1	0.3	0.078	1.46	0.00	0.33	0.19	0.0001	0.00	1.21	0.00	0.00	0.00	0.29	1.21	0.01	0.00	0.00
Del Amo, Alameda to I-710	92.5	0.6	0.165	3.07	0.00	0.71	0.15	0.0001	0.00	2.40	0.00	0.00	0.00	0.23	0.95	0.01	0.00	0.00
223rd Street, I-110 to Avalon	28.2	0.2	0.059	1.09	0.00	0.25	0.01	0.0000	0.00	0.82	0.00	0.00	0.00	0.02	0.09	0.00	0.00	0.00
223rd Street, Avalon to Wilmington	24.2	0.2	0.049	0.90	0.00	0.21	0.01	0.0000	0.00	0.68	0.00	0.00	0.00	0.02	0.08	0.00	0.00	0.00
223rd Street, Wilmington to Alameda	20.8	0.1	0.025	0.47	0.00	0.11	0.08	0.0000	0.00	0.40	0.00	0.00	0.00	0.12	0.51	0.00	0.00	0.00
W Wardlow from Alameda to I-710	20.1	0.1	0.041	0.77	0.00	0.18	0.04	0.0000	0.00	0.60	0.00	0.00	0.00	0.05	0.23	0.00	0.00	0.00

Table B-27
70-Year Averaged Emissions Alt 1 (2015-2072)
Truck Emissions

	Total Average Annual Toxic Emissions from Trucks																	
Emissions 2015-2072	DPM	Acet-aldehyde	Acrolein	Benzene	Bromine	1,3-Butadiene	Chlorine	Chromium	Copper	Form-aldehyde	n-Hexane	Manganese	Nickel	Propylene	Sulfates	Toluene	Xylenes	Zinc
Averaged over 70-years	9901	75070	107028	71432	7726956	106990	7782505	18540299	7440508	50000	110543	7439965	7440020	115071	9960	108883	1210	7440666
ALTERNATIVE 1 - PROJECT	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to Transition																		
New Dock Ramps - Cerritos Channel (A1 Line)	3.17E+02	2.16E-01	1.36E-03	8.05E-01	7.67E-02	5.69E-03	1.07E+01	3.83E-03	7.67E-02	5.76E+00	1.42E-01	7.67E-02	7.67E-02	1.20E+01	6.90E+01	2.84E-01	1.42E-01	7.67E-02
SB Cerritos Channel - Transition (G1 Line)	8.59E+01	5.86E-02	3.68E-04	2.18E-01	2.08E-02	1.54E-03	2.91E+00	1.04E-03	2.08E-02	1.56E+00	3.84E-02	2.08E-02	2.08E-02	3.25E+00	1.87E+01	7.68E-02	3.84E-02	2.08E-02
NB Cerritos Channel - Transition (E1 Line)	9.92E+01	6.76E-02	4.25E-04	2.52E-01	2.40E-02	1.78E-03	3.35E+00	1.20E-03	2.40E-02	1.80E+00	4.43E-02	2.40E-02	2.40E-02	3.75E+00	2.16E+01	8.86E-02	4.43E-02	2.40E-02
Mainline Transition to HF Ramps & SR-103																		
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	6.97E+01	3.27E-02	3.74E-04	1.23E-01	1.14E-02	1.56E-03	1.60E+00	5.72E-04	1.14E-02	8.62E-01	2.12E-02	1.14E-02	1.14E-02	1.79E+00	1.03E+01	4.23E-02	2.12E-02	1.14E-02
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	6.06E+01	2.84E-02	3.26E-04	1.07E-01	9.95E-03	1.35E-03	1.39E+00	4.97E-04	9.95E-03	7.49E-01	1.84E-02	9.95E-03	9.95E-03	1.56E+00	8.95E+00	3.68E-02	1.84E-02	9.95E-03
Henry Ford Exit and Entrance Ramps	1.89E+01	2.15E-02	7.40E-04	8.66E-02	7.15E-03	3.05E-03	1.00E+00	3.58E-04	7.15E-03	5.45E-01	1.32E-02	7.15E-03	7.15E-03	1.12E+00	6.44E+00	2.65E-02	1.32E-02	7.15E-03
Henry Ford n/o Ramps to Alameda	1.19E+02	8.62E-02	3.44E-03	3.53E-01	2.84E-02	1.42E-02	3.97E+00	1.42E-03	2.84E-02	2.17E+00	5.25E-02	2.84E-02	2.84E-02	4.44E+00	2.55E+01	1.05E-01	5.25E-02	2.84E-02
SR-47 Extension, HF Ramps to Alameda																		
SB, 103 Split to Dominguex Channel (D1 Line)	2.20E+02	2.17E-01	1.25E-03	8.07E-01	7.70E-02	5.25E-03	1.08E+01	3.85E-03	7.70E-02	5.79E+00	1.42E-01	7.70E-02	7.70E-02	1.20E+01	6.93E+01	2.85E-01	1.42E-01	7.70E-02
NB, 103 Split to Dominguex Channel (F1 Line)	2.17E+02	2.14E-01	1.24E-03	7.95E-01	7.59E-02	5.17E-03	1.06E+01	3.79E-03	7.59E-02	5.70E+00	1.40E-01	7.59E-02	7.59E-02	1.19E+01	6.83E+01	2.81E-01	1.40E-01	7.59E-02
Dominguex Channel - Alameda (I1 Line)	5.23E+02	5.15E-01	2.97E-03	1.91E+00	1.83E-01	1.24E-02	2.56E+01	9.13E-03	1.83E-01	1.37E+01	3.38E-01	1.83E-01	1.83E-01	2.85E+01	1.64E+02	6.76E-01	3.38E-01	1.83E-01
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	4.82E+02	2.40E-01	2.75E-03	9.06E-01	8.40E-02	1.15E-02	1.18E+01	4.20E-03	8.40E-02	6.33E+00	1.55E-01	8.40E-02	8.40E-02	1.31E+01	7.56E+01	3.11E-01	1.55E-01	8.40E-02
SR-103 Anaheim to PCH	2.97E+02	1.52E-01	2.51E-03	5.81E-01	5.25E-02	1.05E-02	7.35E+00	2.62E-03	5.25E-02	3.96E+00	9.71E-02	5.25E-02	5.25E-02	8.20E+00	4.72E+01	1.94E-01	9.71E-02	5.25E-02
SR-103 PCH to Sepulveda/Willow	3.48E+02	2.02E-01	7.22E-03	8.06E-01	6.60E-02	3.01E-02	9.25E+00	3.30E-03	6.60E-02	5.04E+00	1.22E-01	6.60E-02	6.60E-02	1.03E+01	5.94E+01	2.44E-01	1.22E-01	6.60E-02
E and W Harry Bridges, Figueroa to start Alameda	2.40E+02	2.08E-01	6.57E-03	8.22E-01	6.88E-02	2.74E-02	9.63E+00	3.44E-03	6.88E-02	5.24E+00	1.27E-01	6.88E-02	6.88E-02	1.08E+01	6.19E+01	2.54E-01	1.27E-01	6.88E-02
Alameda beginning (E Harry Bridges) to Anaheim	1.47E+02	1.98E-01	9.61E-03	8.12E-01	6.22E-02	4.02E-02	8.71E+00	3.11E-03	6.22E-02	4.78E+00	1.15E-01	6.22E-02	6.22E-02	9.72E+00	5.60E+01	2.30E-01	1.15E-01	6.22E-02
Alameda Anaheim to Henry Ford	4.86E+01	7.51E-02	5.36E-03	3.24E-01	2.20E-02	2.24E-02	3.08E+00	1.10E-03	2.20E-02	1.72E+00	4.07E-02	2.20E-02	2.20E-02	3.44E+00	1.98E+01	8.15E-02	4.07E-02	2.20E-02
Alameda, Henry Ford to PCH	8.69E+01	8.80E-02	4.41E-03	3.63E-01	2.76E-02	1.84E-02	3.86E+00	1.38E-03	2.76E-02	2.12E+00	5.11E-02	2.76E-02	2.76E-02	4.31E+00	2.48E+01	1.02E-01	5.11E-02	2.76E-02
Alameda PCH to 405	1.71E+03	1.99E+00	8.00E-02	8.03E+00	6.43E-01	3.34E-01	9.01E+01	3.22E-02	6.43E-01	4.92E+01	1.19E+00	6.43E-01	6.43E-01	1.01E+02	5.79E+02	2.38E+00	1.19E+00	6.43E-01
Alameda 405 to del Amo	6.65E+02	6.49E-01	5.35E-02	2.87E+00	1.84E-01	2.23E-01	2.58E+01	9.21E-03	1.84E-01	1.45E+01	3.41E-01	1.84E-01	1.84E-01	2.88E+01	1.66E+02	6.81E-01	3.41E-01	1.84E-01
Alameda, del Amo to South Santa Fe Avenue	2.38E+02	2.01E-01	1.67E-02	8.91E-01	5.70E-02	6.96E-02	7.98E+00	2.85E-03	5.70E-02	4.48E+00	1.06E-01	5.70E-02	5.70E-02	8.92E+00	5.13E+01	2.11E-01	1.06E-01	5.70E-02
Alameda, South Santa Fe Avenue to SR-91	2.50E+02	2.54E-01	1.86E-02	1.10E+00	7.42E-02	7.78E-02	1.04E+01	3.71E-03	7.42E-02	5.79E+00	1.37E-01	7.42E-02	7.42E-02	1.16E+01	6.67E+01	2.74E-01	1.37E-01	7.42E-02
I-110, "C" Street Interchange to Anaheim	4.62E+02	3.20E-01	2.53E-02	1.40E+00	9.15E-02	1.06E-01	1.28E+01	4.58E-03	9.15E-02	7.18E+00	1.69E-01	9.15E-02	9.15E-02	1.43E+01	8.24E+01	3.39E-01	1.69E-01	9.15E-02
I-110, Anaheim to PCH	7.72E+02	5.49E-01	4.74E-02	2.45E+00	1.54E-01	1.98E-01	2.15E+01	7.68E-03	1.54E-01	1.21E+01	2.84E-01	1.54E-01	1.54E-01	2.40E+01	1.38E+02	5.69E-01	2.84E-01	1.54E-01
1-110, PCH to Sepulveda	1.46E+03	1.09E+00	1.20E-01	5.10E+00	2.81E-01	5.03E-01	3.93E+01	1.40E-02	2.81E-01	2.26E+01	5.19E-01	2.81E-01	2.81E-01	4.39E+01	2.53E+02	1.04E+00	5.19E-01	2.81E-01
I-110, Sepulveda to Carson	1.64E+03	1.32E+00	1.92E-01	6.58E+00	2.95E-01	8.01E-01	4.14E+01	1.48E-02	2.95E-01	2.45E+01	5.47E-01	2.95E-01	2.95E-01	4.62E+01	2.66E+02	1.09E+00	5.47E-01	2.95E-01
I-110, Carson to Del Amo	1.06E+03	8.77E-01	1.38E-01	4.47E+00	1.87E-01	5.77E-01	2.61E+01	9.33E-03	1.87E-01	1.57E+01	3.45E-01	1.87E-01	1.87E-01	2.92E+01	1.68E+02	6.90E-01	3.45E-01	1.87E-01
I-110, Del Amo to 405	7.84E+02	5.85E-01	1.06E-01	3.12E+00	1.12E-01	4.43E-01	1.57E+01	5.60E-03	1.12E-01	9.73E+00	2.07E-01	1.12E-01	1.12E-01	1.75E+01	1.01E+02	4.15E-01	2.07E-01	1.12E-01
I-110, 405 to SR-91	1.14E+03	1.06E+00	2.35E-01	6.02E+00	1.62E-01	9.81E-01	2.27E+01	8.12E-03	1.62E-01	1.51E+01	3.00E-01	1.62E-01	1.62E-01	2.54E+01	1.46E+02	6.01E-01	3.00E-01	1.62E-01
I-710, Anaheim to PCH	1.62E+03	8.90E-01	3.42E-02	3.57E+00	2.89E-01	1.43E-01	4.04E+01	1.44E-02	2.89E-01	2.21E+01	5.34E-01	2.89E-01	2.89E-01	4.52E+01	2.60E+02	1.07E+00	5.34E-01	2.89E-01
I-710, PCH to Willow	3.33E+03	1.84E+00	7.76E-02	7.44E+00	5.89E-01	3.24E-01	8.25E+01	2.95E-02	5.89E-01	4.51E+01	1.09E+00	5.89E-01	5.89E-01	9.21E+01	5.30E+02	2.18E+00	1.09E+00	5.89E-01
I-710, Willow to 405	5.02E+03	2.78E+00	1.20E-01	1.13E+01	8.88E-01	5.03E-01	1.24E+02	4.44E-02	8.88E-01	6.80E+01	1.64E+00	8.88E-01	8.88E-01	1.39E+02	7.99E+02	3.28E+00	1.64E+00	8.88E-01
I-710, 405 to Del Amo	4.77E+03	2.86E+00	1.74E-01	1.20E+01	8.66E-01	7.26E-01	1.21E+02	4.33E-02	8.66E-01	6.71E+01	1.60E+00	8.66E-01	8.66E-01	1.35E+02	7.79E+02	3.20E+00	1.60E+00	8.66E-01
I-710, Del Amo to Long Beach Blvd Interchange	3.91E+03	2.36E+00	1.58E-01	1.01E+01	7.04E-01	6.59E-01	9.85E+01	3.52E-02	7.04E-01	5.47E+01	1.30E+00	7.04E-01	7.04E-01	1.10E+02	6.33E+02	2.60E+00	1.30E+00	7.04E-01
I-710, Long Beach Boulevard to SR-91	3.25E+03	1.98E+00	1.56E-01	8.73E+00	5.72E-01	6.52E-01	8.01E+01	2.86E-02	5.72E-01	4.48E+01	1.06E+00	5.72E-01	5.72E-01	8.94E+01	5.15E+02	2.12E+00	1.06E+00	5.72E-01
PCH, I110 to Alameda	3.26E+02	3.19E-01	4.90E-02	1.61E+00	6.90E-02	2.05E-01	9.66E+00	3.45E-03	6.90E-02	5.79E+00	1.28E-01	6.90E-02	6.90E-02	1.08E+01	6.21E+01	2.55E-01	1.28E-01	6.90E-02
PCH, Alameda to SR-103	4.55E+01	3.66E-02	8.91E-03	2.17E-01	5.01E-03	3.72E-02	7.01E-01	2.50E-04	5.01E-03	4.87E-01	9.26E-03	5.01E-03	5.01E-03	7.83E-01	4.51E+00	1.85E-02	9.26E-03	5.01E-03
PCH, SR-103 to I-710	3.02E+02	1.49E-01	9.47E-03	6.37E-01	4.53E-02	3.94E-02	6.34E+00	2.26E-03	4.53E-02	3.51E+00	8.37E-02	4.53E-02	4.53E-02	7.08E+00	4.07E+01	1.67E-01	8.37E-02	4.53E-02
Sepulveda, I-110 to Avalon	4.02E+01	7.16E-02	2.14E-02	4.58E-01	5.95E-03	8.92E-02	8.33E-01	2.98E-04	5.95E-03	7.15E-01	1.10E-02	5.95E-03	5.95E-03	9.30E-01	5.36E+00	2.20E-02	1.10E-02	5.95E-03
Sepulveda, Avalon to Alameda	5.90E+01	7.74E-02	2.56E-02	5.28E-01	4.95E-03	1.07E-01	6.93E-01	2.47E-04	4.95E-03	6.90E-01	9.15E-03	4.95E-03	4.95E-03	7.74E-01	4.45E+00	1.83E-02	9.15E-03	4.95E-03
Sepulveda, Alameda to ICTF	5.48E+01	5.11E-02	4.93E-03	2.32E-01	1.38E-02	2.06E-02	1.93E+00	6.89E-04	1.38E-02	1.09E+00	2.55E-02	1.38E-02	1.38E-02	2.15E+00	1.24E+01	5.10E-02	2.55E-02	1.38E-02
Sepulveda, ICTF to SR-103	4.62E+01	3.34E-02	1.00E-03	1.32E-01	1.11E-02	4.18E-03	1.55E+00	5.55E-04	1.11E-02	8.44E-01	2.05E-02	1.11E-02	1.11E-02	1.74E+00	9.99E+00	4.11E-02	2.05E-02	1.11E-02
Del Amo, I-110 to Wilmington	7.45E+01	1.20E-01	4.25E-02	8.39E-01	4.72E-03	1.77E-01	6.60E-01	2.36E-04	4.72E-03	8.84E-01	8.73E-03	4.72E-03	4.72E-03	7.37E-01	4.24E+00	1.75E-02	8.73E-03	4.72E-03
Del Amo, Wilmington to Alameda	6.31E+01	1.30E-01	3.16E-02	7.62E-01	1.71E-02	1.32E-01	2.39E+00	8.53E-04	1.71E-02	1.68E+00	3.16E-02	1.71E-02	1.71E-02	2.67E+00	1.54E+01	6.31E-02	3.16E-02	1.71E-02
Del Amo, Alameda to I-710	6.23E+01	1.29E-01	3.88E-02	8.25E-01	1.01E-02	1.62E-01	1.41E+00	5.05E-04	1.01E-02	1.25E+00	1.87E-02	1.01E-02	1.01E-02	1.58E+00	9.09E+00	3.74E-02	1.87E-02	1.01E-02
223rd Street, I-110 to Avalon	2.70E+01	4.81E-02	1.73E-02	3.36E-01	1.40E-03	7.22E-02	1.96E-01	7.01E-05	1.40E-03	3.22E-01	2.59E-03	1.40E-03	1.40E-03	2.19E-01	1.26E+00	5.19E-03	2.59E-03	1.40E-03
223rd Street, Avalon to Wilmington	1.72E+01	3.68E-02	1.31E-02	2.54E-01	9.94E-04	5.48E-02	1.39E-01	4.97E-05	9.94E-04	2.40E-01	1.84E-03	9.94E-04	9.94E-04	1.55E-01	8.95E-01	3.68E-03	1.84E-03	9.94E-04
223rd Street, Wilmington to Alameda	5.55E+01	7.51E-02	1.48E-02	4.12E-01	1.34E-02	6.18E-02	1.88E+00	6.71E-04	1.34E-02	1.19E+00	2.48E-02	1.34E-02	1.34E-02	2.10E+00	1.21E+01	4.96E-02	2.48E-02	1.34E-02
W Wardlow from Alameda to I-710	2.94E+02	9.83E-02	2.26E-02	5.81E-01	1.56E-02	9.41E-02	2.19E+00	7.81E-04	1.56E-02	1.45E+00	2.89E-02	1.56E-02	1.56E-02	2.44E+00	1.41E+01	5.78E-02	2.89E-02	1.56E-02

Table B-28
70-Year Averaged Emissions Alternative 2 (2015-2072)
Truck Emissions

	Total Average Annual Toxic Emissions from Trucks																	
Emissions 2015-2073	DPM	Acet-aldehyde	Acrolein	Benzene	Bromine	1,3-Butadiene	Chlorine	Chromium	Copper	Form-aldehyde	n-Hexane	Manganese	Nickel	Propylene	Sulfates	Toluene	Xylenes	Zinc
Averaged Over 70-years	9901	75070	107028	71432	7726956	106990	7782505	18540299	7440508	50000	110543	7439965	7440020	115071	9960	108883	1210	7440666
ALTERNATIVE 2 - PROJECT	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to HF Ramps	8.67E+02	5.18E-01	1.97E-03	1.92E+00	1.85E-01	8.25E-03	2.59E+01	9.25E-03	1.85E-01	1.39E+01	3.42E-01	1.85E-01	1.85E-01	2.89E+01	1.66E+02	6.84E-01	3.42E-01	1.85E-01
Henry Ford Ramps	2.85E+01	2.33E-02	8.19E-05	8.63E-02	8.33E-03	3.41E-04	1.17E+00	4.17E-04	8.33E-03	6.25E-01	1.54E-02	8.33E-03	8.33E-03	1.30E+00	7.50E+00	3.08E-02	1.54E-02	8.33E-03
Henry Ford n/o Ramps to Alameda	1.54E+02	8.27E-02	3.26E-03	3.38E-01	2.72E-02	1.34E-02	3.81E+00	1.36E-03	2.72E-02	2.08E+00	5.04E-02	2.72E-02	2.72E-02	4.26E+00	2.45E+01	1.01E-01	5.04E-02	2.72E-02
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1.18E+03	7.29E-01	3.02E-03	2.70E+00	2.60E-01	1.26E-02	3.64E+01	1.30E-02	2.60E-01	1.95E+01	4.81E-01	2.60E-01	2.60E-01	4.06E+01	2.34E+02	9.61E-01	4.81E-01	2.60E-01
SR-103 Anaheim to PCH	7.28E+02	4.43E-01	3.89E-03	1.66E+00	1.56E-01	1.63E-02	2.18E+01	7.79E-03	1.56E-01	1.17E+01	2.88E-01	1.56E-01	1.56E-01	2.44E+01	1.40E+02	5.77E-01	2.88E-01	1.56E-01
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	5.34E+02	3.12E-01	5.39E-03	1.19E+00	1.07E-01	2.25E-02	1.50E+01	5.36E-03	1.07E-01	8.11E+00	1.99E-01	1.07E-01	1.07E-01	1.68E+01	9.66E+01	3.97E-01	1.99E-01	1.07E-01
SR-103 Ramps south of Sepulveda/Willow																		
NB Sepulveda Ramp (G2 Line)	7.73E+01	3.93E-02	1.10E-03	1.54E-01	1.31E-02	4.61E-03	1.84E+00	6.57E-04	1.31E-02	9.98E-01	2.43E-02	1.31E-02	1.31E-02	2.05E+00	1.18E+01	4.86E-02	2.43E-02	1.31E-02
SB Sepulveda Ramp (F2 Ramp)	5.44E+01	2.76E-02	7.77E-04	1.09E-01	9.24E-03	3.24E-03	1.29E+00	4.62E-04	9.24E-03	7.02E-01	1.71E-02	9.24E-03	9.24E-03	1.44E+00	8.32E+00	3.42E-02	1.71E-02	9.24E-03
SR-103 Existing, End Ramps to Sepulveda/Willow																		
SB Sepulveda Ramp Traffic	1.00E+01	5.09E-03	1.43E-04	2.00E-02	1.70E-03	5.97E-04	2.38E-01	8.51E-05	1.70E-03	1.29E-01	3.15E-03	1.70E-03	1.70E-03	2.66E-01	1.53E+00	6.30E-03	3.15E-03	1.70E-03
SB+NB Sepulveda Ramp Traffic	3.94E+01	2.00E-02	5.62E-04	7.85E-02	6.69E-03	2.35E-03	9.36E-01	3.34E-04	6.69E-03	5.08E-01	1.24E-02	6.69E-03	6.69E-03	1.05E+00	6.02E+00	2.47E-02	1.24E-02	6.69E-03
SR-103, Realignment to End (223rd/Wardlow)	1.26E+03	8.92E-01	1.24E-02	3.38E+00	3.10E-01	5.20E-02	4.34E+01	1.55E-02	3.10E-01	2.34E+01	5.73E-01	3.10E-01	3.10E-01	4.84E+01	2.79E+02	1.15E+00	5.73E-01	3.10E-01
E and W Harry Bridges, Figueroa to start Alameda	2.11E+02	2.06E-01	8.91E-03	8.38E-01	6.60E-02	3.72E-02	9.24E+00	3.30E-03	6.60E-02	5.06E+00	1.22E-01	6.60E-02	6.60E-02	1.03E+01	5.94E+01	2.44E-01	1.22E-01	6.60E-02
Alameda beginning (E Harry Bridges) to Anaheim	1.26E+02	2.12E-01	1.25E-02	8.88E-01	6.45E-02	5.21E-02	9.02E+00	3.22E-03	6.45E-02	4.99E+00	1.19E-01	6.45E-02	6.45E-02	1.01E+01	5.80E+01	2.39E-01	1.19E-01	6.45E-02
Alameda Anaheim to Henry Ford	4.32E+01	8.51E-02	6.96E-03	3.75E-01	2.41E-02	2.91E-02	3.37E+00	1.20E-03	2.41E-02	1.89E+00	4.46E-02	2.41E-02	2.41E-02	3.77E+00	2.17E+01	8.92E-02	4.46E-02	2.41E-02
Alameda, Henry Ford to PCH	9.02E+01	1.08E-01	5.75E-03	4.47E-01	3.34E-02	2.40E-02	4.67E+00	1.67E-03	3.34E-02	2.57E+00	6.18E-02	3.34E-02	3.34E-02	5.22E+00	3.01E+01	1.24E-01	6.18E-02	3.34E-02
Alameda PCH to 405	6.35E+02	7.45E-01	7.89E-02	3.45E+00	1.95E-01	3.30E-01	2.72E+01	9.73E-03	1.95E-01	1.56E+01	3.60E-01	1.95E-01	1.95E-01	3.04E+01	1.75E+02	7.20E-01	3.60E-01	1.95E-01
Alameda 405 to del Amo	7.31E+02	6.67E-01	5.40E-02	2.94E+00	1.90E-01	2.25E-01	2.66E+01	9.49E-03	1.90E-01	1.49E+01	3.51E-01	1.90E-01	1.90E-01	2.97E+01	1.71E+02	7.03E-01	3.51E-01	1.90E-01
Alameda, del Amo to South Santa Fe Avenue	2.51E+02	2.03E-01	1.76E-02	9.07E-01	5.69E-02	7.35E-02	7.97E+00	2.85E-03	5.69E-02	4.49E+00	1.05E-01	5.69E-02	5.69E-02	8.90E+00	5.12E+01	2.11E-01	1.05E-01	5.69E-02
Alameda, South Santa Fe Avenue to SR-91	2.62E+02	2.41E-01	1.98E-02	1.07E+00	6.86E-02	8.25E-02	9.61E+00	3.43E-03	6.86E-02	5.39E+00	1.27E-01	6.86E-02	6.86E-02	1.07E+01	6.18E+01	2.54E-01	1.27E-01	6.86E-02
I-110, "C" Street Interchange to Anaheim	4.47E+02	3.20E-01	2.52E-02	1.40E+00	9.18E-02	1.05E-01	1.28E+01	4.59E-03	9.18E-02	7.19E+00	1.70E-01	9.18E-02	9.18E-02	1.43E+01	8.26E+01	3.40E-01	1.70E-01	9.18E-02
I-110, Anaheim to PCH	7.50E+02	5.50E-01	4.74E-02	2.45E+00	1.54E-01	1.98E-01	2.15E+01	7.70E-03	1.54E-01	1.21E+01	2.85E-01	1.54E-01	1.54E-01	2.41E+01	1.39E+02	5.70E-01	2.85E-01	1.54E-01
1-110, PCH to Sepulveda	1.40E+03	1.08E+00	1.20E-01	5.06E+00	2.78E-01	5.00E-01	3.89E+01	1.39E-02	2.78E-01	2.23E+01	5.14E-01	2.78E-01	2.78E-01	4.35E+01	2.50E+02	1.03E+00	5.14E-01	2.78E-01
I-110, Sepulveda to Carson	1.57E+03	1.30E+00	1.91E-01	6.52E+00	2.91E-01	7.99E-01	4.07E+01	1.45E-02	2.91E-01	2.42E+01	5.38E-01	2.91E-01	2.91E-01	4.55E+01	2.62E+02	1.08E+00	5.38E-01	2.91E-01
I-110, Carson to Del Amo	1.01E+03	8.70E-01	1.38E-01	4.44E+00	1.84E-01	5.77E-01	2.57E+01	9.19E-03	1.84E-01	1.55E+01	3.40E-01	1.84E-01	1.84E-01	2.87E+01	1.65E+02	6.80E-01	3.40E-01	1.84E-01
I-110, Del Amo to 405	7.49E+02	5.79E-01	1.06E-01	3.10E+00	1.10E-01	4.44E-01	1.54E+01	5.50E-03	1.10E-01	9.58E+00	2.04E-01	1.10E-01	1.10E-01	1.72E+01	9.91E+01	4.07E-01	2.04E-01	1.10E-01
I-110, 405 to SR-91	1.09E+03	1.05E+00	2.36E-01	6.01E+00	1.58E-01	9.88E-01	2.21E+01	7.90E-03	1.58E-01	1.48E+01	2.92E-01	1.58E-01	1.58E-01	2.47E+01	1.42E+02	5.85E-01	2.92E-01	1.58E-01
I-710, Anaheim to PCH	1.62E+03	9.21E-01	3.46E-02	3.69E+00	2.99E-01	1.45E-01	4.19E+01	1.50E-02	2.99E-01	2.29E+01	5.54E-01	2.99E-01	2.99E-01	4.68E+01	2.69E+02	1.11E+00	5.54E-01	2.99E-01
I-710, PCH to Willow	3.24E+03	1.95E+00	7.80E-02	7.85E+00	6.29E-01	3.26E-01	8.80E+01	3.14E-02	6.29E-01	4.81E+01	1.16E+00	6.29E-01	6.29E-01	9.83E+01	5.66E+02	2.33E+00	1.16E+00	6.29E-01
I-710, Willow to 405	4.89E+03	2.94E+00	1.20E-01	1.19E+01	9.47E-01	5.03E-01	1.33E+02	4.74E-02	9.47E-01	7.25E+01	1.75E+00	9.47E-01	9.47E-01	1.48E+02	8.53E+02	3.51E+00	1.75E+00	9.47E-01
I-710, 405 to Del Amo	4.69E+03	2.85E+00	1.70E-01	1.20E+01	8.68E-01	7.11E-01	1.21E+02	4.34E-02	8.68E-01	6.72E+01	1.61E+00	8.68E-01	8.68E-01	1.36E+02	7.81E+02	3.21E+00	1.61E+00	8.68E-01
I-710, Del Amo to Long Beach Blvd Interchange	3.91E+03	2.37E+00	1.54E-01	1.01E+01	7.10E-01	6.44E-01	9.94E+01	3.55E-02	7.10E-01	5.51E+01	1.31E+00	7.10E-01	7.10E-01	1.11E+02	6.39E+02	2.63E+00	1.31E+00	7.10E-01
I-710, Long Beach Boulevard to SR-91	3.26E+03	1.99E+00	1.53E-01	8.73E+00	5.77E-01	6.40E-01	8.08E+01	2.89E-02	5.77E-01	4.52E+01	1.07E+00	5.77E-01	5.77E-01	9.03E+01	5.20E+02	2.14E+00	1.07E+00	5.77E-01
PCH, I-110 to Alameda	2.99E+02	3.13E-01	5.27E-02	1.63E+00	6.39E-02	2.20E-01	8.94E+00	3.19E-03	6.39E-02	5.45E+00	1.18E-01	6.39E-02	6.39E-02	9.99E+00	5.75E+01	2.36E-01	1.18E-01	6.39E-02
PCH, Alameda to SR-103	3.34E+01	3.30E-02	7.73E-03	1.93E-01	4.82E-03	3.22E-02	6.74E-01	2.41E-04	4.82E-03	4.58E-01	8.91E-03	4.82E-03	4.82E-03	7.53E-01	4.33E+00	1.78E-02	8.91E-03	4.82E-03
PCH, SR-103 to I-710	2.50E+02	2.04E-01	1.06E-02	8.51E-01	6.41E-02	4.42E-02	8.98E+00	3.21E-03	6.41E-02	4.94E+00	1.19E-01	6.41E-02	6.41E-02	1.00E+01	5.77E+01	2.37E-01	1.19E-01	6.41E-02
Sepulveda, I-110 to Avalon	3.78E+01	7.16E-02	2.16E-02	4.61E-01	5.75E-03	9.03E-02	8.05E-01	2.88E-04	5.75E-03	7.03E-01	1.06E-02	5.75E-03	5.75E-03	8.99E-01	5.18E+00	2.13E-02	1.06E-02	5.75E-03
Sepulveda, Avalon to Alameda	5.01E+01	7.17E-02	2.47E-02	5.01E-01	4.06E-03	1.03E-01	5.69E-01	2.03E-04	4.06E-03	6.10E-01	7.51E-03	4.06E-03	4.06E-03	6.35E-01	3.66E+00	1.50E-02	7.51E-03	4.06E-03
Sepulveda, Alameda to ICTF	3.45E+01	4.23E-02	4.27E-03	1.94E-01	1.13E-02	1.78E-02	1.58E+00	5.64E-04	1.13E-02	8.99E-01	2.09E-02	1.13E-02	1.13E-02	1.76E+00	1.02E+01	4.18E-02	2.09E-02	1.13E-02
Sepulveda, ICTF to SR-103	4.21E+01	3.10E-02	8.12E-04	1.21E-01	1.04E-02	3.39E-03	1.46E+00	5.21E-04	1.04E-02	7.91E-01	1.93E-02	1.04E-02	1.04E-02	1.63E+00	9.38E+00	3.86E-02	1.93E-02	1.04E-02
Del Amo, I-110 to Wilmington	6.88E+01	1.19E-01	4.25E-02	8.39E-01	4.72E-03	1.77E-01	6.60E-01	2.36E-04	4.72E-03	8.83E-01	8.73E-03	4.72E-03	4.72E-03	7.37E-01	4.24E+00	1.75E-02	8.73E-03	4.72E-03
Del Amo, Wilmington to Alameda	6.10E+01	1.28E-01	3.11E-02	7.51E-01	1.68E-02	1.30E-01	2.36E+00	8.42E-04	1.68E-02	1.65E+00	3.12E-02	1.68E-02	1.68E-02	2.63E+00	1.52E+01	6.23E-02	3.12E-02	1.68E-02
Del Amo, Alameda to I-710	8.42E+01	1.10E-01	3.17E-02	6.99E-01	1.06E-02	1.32E-01	1.48E+00	5.30E-04	1.06E-02	1.19E+00	1.96E-02	1.06E-02	1.06E-02	1.66E+00	9.54E+00	3.92E-02	1.96E-02	1.06E-02
223rd Street, I-110 to Avalon	2.55E+01	4.73E-02	1.66E-02	3.26E-01	1.78E-03	6.91E-02	2.49E-01	8.89E-05	1.78E-03	3.41E-01	3.29E-03	1.78E-03	1.78E-03	2.78E-01	1.60E+00	6.58E-03	3.29E-03	1.78E-03
223rd Street, Avalon to Wilmington	2.01E+01	3.97E-02	1.34E-02	2.69E-01	1.86E-03	5.60E-02	2.61E-01	9.32E-05	1.86E-03	3.08E-01	3.45E-03	1.86E-03	1.86E-03	2.91E-01	1.68E+00	6.90E-03	3.45E-03	1.86E-03
223rd Street, Wilmington to Alameda	7.11E+01	7.52E-02	1.42E-02	4.07E-01	1.40E-02	5.93E-02	1.96E+00	6.99E-04	1.40E-02	1.23E+00	2.58E-02	1.40E-02	1.40E-02	2.18E+00	1.26E+01	5.17E-02	2.58E-02	1.40E-02
W Wardlow from Alameda to I-710	2.54E+02	1.24E-01	2.25E-02	6.71E-01	2.48E-02	9.35E-02	3.47E+00	1.24E-03	2.48E-02	2.14E+00	4.59E-02	2.48E-02	2.48E-02	3.88E+00	2.23E+01	9.18E-02	4.59E-02	2.48E-02

Table B-29
70-year Average Baseline
Auto Emissions

70-year average emissions (2003-2073)	Average Toxic Emissions from Autos				
	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
	71432	50000	106990	75070	107028
Baseline - 70-year emissions	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to HF Ramps	7.09	4.96	1.61	1.10	0.38
Henry Ford Ramps	1.02	0.71	0.23	0.16	0.05
Henry Ford n/o Ramps to Alameda	9.77	7.03	2.23	1.65	0.53
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	4.69	3.27	1.06	0.72	0.25
SR-103 Anaheim to PCH	3.11	2.15	0.70	0.47	0.17
SR-103 PCH to Sepulveda/Willow	5.70	3.90	1.28	0.82	0.31
E and W Harry Bridges, Figueroa to start Alameda	21.55	15.44	4.92	3.61	1.16
Alameda beginning (E Harry Bridges) to Anaheim	17.29	12.31	3.94	2.84	0.93
Alameda Anaheim to Henry Ford	5.55	4.00	1.27	0.95	0.30
Alameda Henry Ford to PCH	5.81	4.21	1.33	1.01	0.31
Alameda PCH to 405	106.38	76.76	24.36	18.20	5.73
Alameda 405 to del Amo	66.79	48.03	15.28	11.31	3.60
Alameda, Del Amo to South Santa Fe Avenue	22.60	16.29	5.17	3.85	1.22
Alameda, South Santa Fe Ave to SR-91	36.59	26.78	8.42	6.53	1.97
I-110, "C" Street Interchange to Anaheim	78.15	56.12	17.87	13.18	4.21
I-110, Anaheim to PCH	134.70	96.93	30.82	22.85	7.25
1-110, PCH to Sepulveda	293.45	211.42	67.17	49.97	15.80
I-110, Sepulveda to Carson	387.97	279.18	88.77	65.82	20.89
I-110, Carson to Del Amo	285.99	206.28	65.49	48.86	15.40
I-110, Del Amo to 405	215.64	155.65	49.39	36.92	11.61
I-110, 405 to SR-91	367.18	264.89	84.09	62.77	19.77
I-710, Anaheim to PCH	73.85	53.20	16.90	12.57	3.98
I-710, PCH to Willow	165.49	119.49	37.91	28.36	8.91
I-710, Willow to 405	263.19	190.18	60.31	45.21	14.17
I-710, 405 to Del Amo	334.91	242.09	76.75	57.59	18.04
I-710, Del Amo to Long Beach Blvd Interchange	276.48	199.80	63.35	47.51	14.89
I-710, Long Beach Boulevard to SR-91	250.60	180.38	57.35	42.55	13.49
PCH-110 to Alameda	93.05	66.91	21.29	15.75	5.01
PCH, Alameda to SR-103	19.03	13.66	4.35	3.20	1.02
PCH, SR-103 to I-710	28.30	20.49	6.49	4.89	1.52
Sepulveda, I-110 to Avalon	34.69	25.01	7.94	5.91	1.87
Sepulveda, Avalon to Alameda	35.98	25.83	8.23	6.06	1.94
Sepulveda, Alameda to ICTF	12.05	8.83	2.77	2.15	0.65
Sepulveda, ICTF to SR-103	2.72	2.01	0.63	0.50	0.15
Del Amo, I-110 to Wilmington	24.35	16.18	5.43	3.18	1.31
Del Amo, Wilmington to Alameda	21.59	15.31	4.92	3.51	1.16
Del Amo, Alameda to I-710	44.37	32.16	10.18	7.69	2.39
223rd Street, I-110 to Avalon	30.89	22.22	7.07	5.23	1.66
223rd Street, Avalon to Wilmington	22.10	15.99	5.07	3.81	1.19
223rd Street, Wilmington to Alameda	12.12	8.65	2.77	2.00	0.65
W Wardlow from Alameda to I-710	26.84	19.00	6.11	4.33	1.44

Table B-30
70-year Averaged Emissions (2003-2015)
Auto Emissions

	Average Toxic Emissions from Autos				
PROJECT - baseline 12-year emission rates (2003-2015)	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
Averaged over 70-years	71432	50000	106990	75070	107028
PROJECT - ALT 1 & ALT 2	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to HF Ramps	3.33	2.47	0.77	0.62	0.18
Henry Ford Ramps	0.45	0.33	0.10	0.08	0.02
Henry Ford n/o Ramps to Alameda	6.46	4.83	1.50	1.23	0.35
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	2.11	1.57	0.49	0.39	0.11
SR-103 Anaheim to PCH	1.26	0.93	0.29	0.23	0.07
SR-103 PCH to Sepulveda/Willow	1.83	1.35	0.42	0.33	0.10
E and W Harry Bridges, Figueroa to start Alameda	13.700	10.2	3.2	2.6	0.7
Alameda beginning (E Harry Bridges) to Anaheim	10.137	7.6	2.3	1.9	0.5
Alameda Anaheim to Henry Ford	3.726	2.8	0.9	0.7	0.2
Alameda Henry Ford to PCH	4.159	3.1	1.0	0.8	0.2
Alameda PCH to 405	72.29	54.07	16.76	13.72	3.90
Alameda 405 to del Amo	43.90	32.83	10.17	8.33	2.37
Alameda, Del Amo to South Santa Fe Avenue	15.26	11.42	3.54	2.90	0.82
Alameda, South Santa Fe Ave to SR-91	28.69	21.54	6.66	5.50	1.55
I-110, "C" Street Interchange to Anaheim	50.49	37.72	11.70	9.55	2.72
I-110, Anaheim to PCH	88.93	66.47	20.61	16.85	4.80
1-110, PCH to Sepulveda	196.17	146.64	45.46	37.18	10.58
I-110, Sepulveda to Carson	256.48	191.75	59.44	48.63	13.83
I-110, Carson to Del Amo	193.38	144.58	44.81	36.67	10.43
I-110, Del Amo to 405	147.28	110.21	34.14	27.99	7.94
I-110, 405 to SR-91	248.76	186.00	57.65	47.18	13.41
I-710, Anaheim to PCH	49.20	36.75	11.40	9.31	2.65
I-710, PCH to Willow	112.74	84.26	26.12	21.35	6.08
I-710, Willow to 405	180.91	135.24	41.92	34.29	9.76
I-710, 405 to Del Amo	231.30	172.98	53.61	43.89	12.47
I-710, Del Amo to Long Beach Blvd Interchange	190.45	142.42	44.14	36.13	10.27
I-710, Long Beach Boulevard to SR-91	166.33	124.39	38.55	31.56	8.97
PCH-110 to Alameda	61.02	45.60	14.14	11.56	3.29
PCH, Alameda to SR-103	12.25	9.16	2.84	2.32	0.66
PCH, SR-103 to I-710	19.93	14.92	4.62	3.79	1.07
Sepulveda, I-110 to Avalon	23.41	17.52	5.43	4.45	1.26
Sepulveda, Avalon to Alameda	23.47	17.59	5.44	4.48	1.27
Sepulveda, Alameda to ICTF	9.45	7.09	2.19	1.81	0.51
Sepulveda, ICTF to SR-103	2.28	1.71	0.53	0.44	0.12
Del Amo, I-110 to Wilmington	3.39	2.38	0.77	0.54	0.18
Del Amo, Wilmington to Alameda	12.07	8.98	2.79	2.26	0.65
Del Amo, Alameda to I-710	31.78	23.84	7.37	6.08	1.71
223rd Street, I-110 to Avalon	20.34	15.21	4.71	3.86	1.10
223rd Street, Avalon to Wilmington	15.47	11.58	3.59	2.95	0.83
223rd Street, Wilmington to Alameda	7.29	5.44	1.69	1.38	0.39
W Wardlow from Alameda to I-710	15.12	11.33	3.51	2.88	0.82

Table B-31
70-year Averaged Emissions Alternative 1 (2015-2072)
Auto Emissions

2015-2073 Average Emission Rates Averaged over 70-years	AverageToxic Emissions from Autos				
	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
	71432	50000	106990	75070	107028
Alternative 1, PROJECT	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to Transition					
New Dock Ramps - Cerritos Channel (A1 Line)	2.137	1.422	0.477	0.280	0.115
SB Cerritos Channel - Transition (G1 Line)	0.579	0.385	0.129	0.076	0.031
NB Cerritos Channel - Transition (E1 Line)	0.668	0.445	0.149	0.088	0.036
Mainline Transition to HF Ramps & SR-103					
SB 103 from 47 Split to Exist 103 / HF Ramps (G1 Line)	0.667	0.443	0.149	0.086	0.036
NB 103 from 47 Split to Exist 103 / HF Ramps (E1 Line)	0.580	0.385	0.129	0.075	0.031
Henry Ford Ramps	1.020	0.676	0.227	0.132	0.055
Henry Ford n/o Ramps to Alameda	3.358	2.216	0.747	0.427	0.180
SR-47 Extension, HF Ramps to Alameda					
SB, 103 Split to Dominguex Channel (D1 Line)	1.067	0.715	0.239	0.143	0.057
NB, 103 Split to Dominguex Channel (F1 Line)	1.052	0.704	0.235	0.141	0.056
Dominguez Channel - Alameda (I1 Line)	2.531	1.695	0.566	0.340	0.136
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	4.236	2.807	0.944	0.547	0.227
SR-103 Anaheim to PCH	2.746	1.818	0.612	0.353	0.147
SR-103 PCH to Sepulveda/Willow	6.148	4.073	1.370	0.793	0.330
E and W Harry Bridges, Figueroa to start Alameda	6.625	4.396	1.477	0.859	0.356
Alameda beginning (E Harry Bridges) to Anaheim	6.213	4.133	1.386	0.814	0.333
Alameda Anaheim to Henry Ford	1.776	1.182	0.396	0.233	0.095
Alameda, Henry Ford to PCH	1.565	1.041	0.349	0.204	0.084
Alameda PCH to 405	32.503	21.686	7.260	4.303	1.745
Alameda 405 to del Amo	22.333	14.847	4.983	2.917	1.199
Alameda, del Amo to South Santa Fe Avenue	6.976	4.625	1.555	0.902	0.374
Alameda, South Santa Fe Avenue to SR-91	7.693	5.106	1.715	0.999	0.413
I-110, "C" Street Interchange to Anaheim	26.694	17.755	5.957	3.493	1.433
I-110, Anaheim to PCH	44.657	29.717	9.967	5.855	2.397
1-110, PCH to Sepulveda	97.057	64.629	21.666	12.755	5.210
I-110, Sepulveda to Carson	131.747	87.594	29.395	17.215	7.071
I-110, Carson to Del Amo	92.829	61.841	20.725	12.219	4.983
I-110, Del Amo to 405	68.383	45.446	15.255	8.921	3.670
I-110, 405 to SR-91	118.522	78.948	26.460	15.595	6.362
I-710, Anaheim to PCH	24.369	16.248	5.442	3.218	1.308
I-710, PCH to Willow	52.659	35.148	11.764	6.981	2.827
I-710, Willow to 405	83.440	55.677	18.639	11.050	4.479
I-710, 405 to Del Amo	104.581	69.742	23.356	13.819	5.614
I-710, Del Amo to Long Beach Blvd Interchange	86.551	57.730	19.331	11.445	4.646
I-710, Long Beach Boulevard to SR-91	83.918	55.760	18.720	10.940	4.504
PCH, I110 to Alameda	29.839	19.853	6.659	3.909	1.602
PCH, Alameda to SR-103	7.286	4.832	1.624	0.943	0.391
PCH, SR-103 to I-710	7.461	4.933	1.662	0.955	0.400
Sepulveda, I-110 to Avalon	11.172	7.407	2.490	1.445	0.600
Sepulveda, Avalon to Alameda	12.296	8.097	2.735	1.549	0.660
Sepulveda, Alameda to ICTF	2.554	1.702	0.570	0.337	0.137
Sepulveda, ICTF to SR-103	0.441	0.294	0.099	0.058	0.024
Del Amo, I-110 to Wilmington	20.706	13.641	4.606	2.614	1.111
Del Amo, Wilminton to Alameda	9.449	6.292	2.109	1.241	0.507
Del Amo, Alameda to I-710	14.070	9.360	3.140	1.843	0.755
223rd Street, I-110 to Avalon	10.518	6.984	2.346	1.368	0.565
223rd Street, Avalon to Wilmington	6.620	4.398	1.477	0.862	0.355
223rd Street, Wilmington to Alameda	4.925	3.264	1.098	0.636	0.264
W Wardlow from Alameda to I-710	11.393	7.451	2.529	1.398	0.611

Table B-32
70-year Averaged Project Emissions Alternative 2 Emissions (2015-2072)
Auto Emissions

2015-2072 Average Emission Rates Averaged over 70-years	AverageToxic Emissions from Autos				
	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
	71432	50000	106990	75070	107028
ALTERNATIVE 2, PROJECT	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
SR-47 Mainline, New Dock Ramps to HF Ramps	4.765	3.167	1.063	0.622	0.256
Henry Ford Ramps	0.930	0.616	0.207	0.120	0.050
Henry Ford n/o Ramps to Alameda	2.353	1.524	0.521	0.278	0.126
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	5.269	3.505	1.176	0.690	0.283
SR-103 Anaheim to PCH	4.334	2.882	0.967	0.567	0.233
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	4.497	2.991	1.003	0.589	0.241
SR-103 Ramps south of Sepulveda/Willow					
NB Sepulveda Ramp (G2 Line)	1.174	0.779	0.262	0.152	0.063
SB Sepulveda Ramp (F2 Ramp)	0.826	0.548	0.184	0.107	0.044
SR-103 Existing, End Ramps to Sepulveda/Willow					
SB Sepulveda Ramp Traffic	0.152	0.101	0.034	0.020	0.008
SB+NB Sepulveda Ramp Traffic	0.598	0.397	0.133	0.077	0.032
SR-103, Realignment to End (223rd/Wardlow)	7.541	5.029	1.684	0.997	0.405
E and W Harry Bridges, Figueroa to start Alameda	7.702	5.111	1.717	0.999	0.413
Alameda beginning (E Harry Bridges) to Anaheim	7.140	4.751	1.594	0.936	0.383
Alameda Anaheim to Henry Ford	1.979	1.318	0.442	0.260	0.106
Alameda, Henry Ford to PCH	1.726	1.149	0.385	0.227	0.093
Alameda PCH to 405	31.200	20.765	6.964	4.092	1.675
Alameda 405 to del Amo	22.297	14.822	4.974	2.912	1.197
Alameda, del Amo to South Santa Fe Avenue	7.418	4.916	1.653	0.957	0.398
Alameda, South Santa Fe Avenue to SR-91	8.236	5.463	1.836	1.067	0.442
I-110, "C" Street Interchange to Anaheim	26.816	17.839	5.984	3.511	1.439
I-110, Anaheim to PCH	44.915	29.885	10.024	5.886	2.411
1-110, PCH to Sepulveda	96.785	64.444	21.605	12.716	5.195
I-110, Sepulveda to Carson	131.616	87.498	29.365	17.192	7.064
I-110, Carson to Del Amo	92.957	61.921	20.753	12.232	4.990
I-110, Del Amo to 405	68.416	45.466	15.263	8.924	3.672
I-110, 405 to SR-91	118.718	79.073	26.503	15.617	6.373
I-710, Anaheim to PCH	24.761	16.508	5.530	3.269	1.329
I-710, PCH to Willow	53.069	35.411	11.854	7.027	2.849
I-710, Willow to 405	83.594	55.765	18.671	11.060	4.487
I-710, 405 to Del Amo	104.238	69.521	23.281	13.780	5.596
I-710, Del Amo to Long Beach Blvd Interchange	86.208	57.505	19.255	11.403	4.628
I-710, Long Beach Boulevard to SR-91	83.685	55.612	18.669	10.915	4.492
PCH, I-110 to Alameda	29.872	19.848	6.664	3.893	1.603
PCH, Alameda to SR-103	6.604	4.378	1.472	0.854	0.354
PCH, SR-103 to I-710	7.885	5.211	1.756	1.007	0.423
Sepulveda, I-110 to Avalon	11.308	7.497	2.521	1.462	0.607
Sepulveda, Avalon to Alameda	12.558	8.265	2.793	1.579	0.674
Sepulveda, Alameda to ICTF	2.612	1.737	0.583	0.342	0.140
Sepulveda, ICTF to SR-103	0.444	0.295	0.099	0.058	0.024
Del Amo, I-110 to Wilmington	20.933	13.785	4.656	2.638	1.123
Del Amo, Wilmington to Alameda	9.323	6.205	2.081	1.223	0.500
Del Amo, Alameda to I-710	12.069	7.973	2.687	1.539	0.648
223rd Street, I-110 to Avalon	10.226	6.792	2.281	1.331	0.549
223rd Street, Avalon to Wilmington	6.603	4.387	1.473	0.861	0.354
223rd Street, Wilmington to Alameda	4.648	3.082	1.036	0.601	0.249
W Wardlow from Alameda to I-710	11.292	7.386	2.506	1.386	0.606

APPENDIX C

Traffic Data and Flow Diagrams

Appendix C Contents

SR-47 Traffic Data: AADT Flow Schematics

2003 Existing (Baseline)

2015 No Build

2015 Alternative 1

2015 Alternative 2

2030 No Build

2030 Alternative 1

2030 Alternative 2

SR-47 Traffic Data: AADT Counts

2003 Existing (Baseline)

2015 No Build

2015 Alternative 1

2015 Alternative 2

2030 No Build

2030 Alternative 1

2030 Alternative 2

SR-47 Traffic Data: Peak Hour Counts (AM, MD and PM)

2003 Existing (Baseline)

2015 No Build

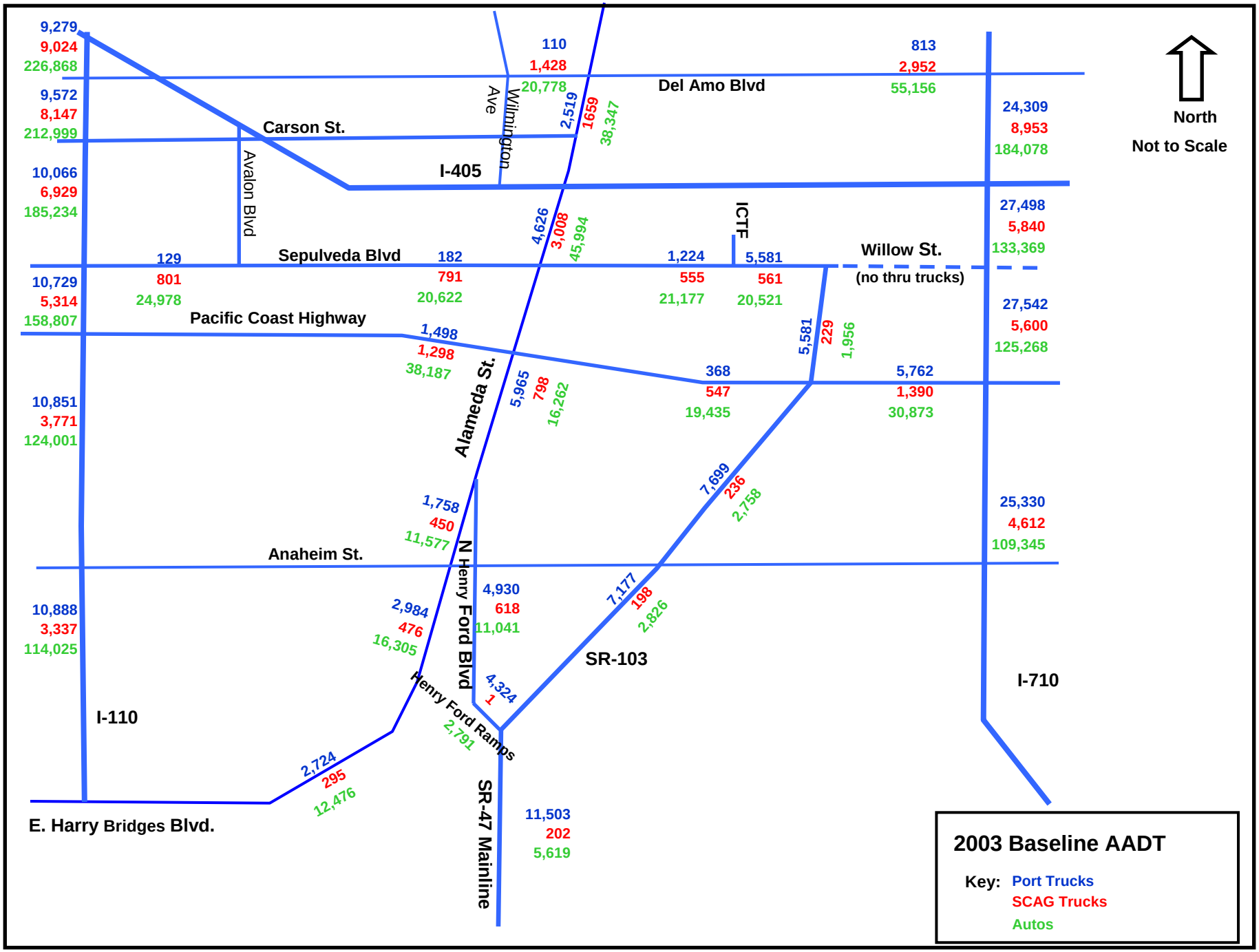
2015 Alternative 1

2015 Alternative 2

2030 No Build

2030 Alternative 1

2030 Alternative 2


North
Not to Scale
Del Amo Blvd
Carson St.
I-405
Avalon Blvd
Wilmington Ave
Sepulveda Blvd
ICTF
Willow St.
(no thru trucks)
Pacific Coast Highway
Alameda St.
Anaheim St.
N Henry Ford Blvd
Henry Ford Ramps
SR-103
I-110
I-710
E. Harry Bridges Blvd.
SR-47 Mainline
9,279
9,024
226,868
9,572
8,147
212,999
10,066
6,929
185,234
10,729
5,314
158,807
10,851
3,771
124,001
10,888
3,337
114,025
110
1,428
20,778
2,519
1659
38,347
813
2,952
55,156
24,309
8,953
184,078
27,498
5,840
133,369
27,542
5,600
125,268
25,330
4,612
109,345
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20,521
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19,435
5,581
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5,762
1,390
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2,758
4,930
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11,041
2,984
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16,305
7,177
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2,826
4,324
1
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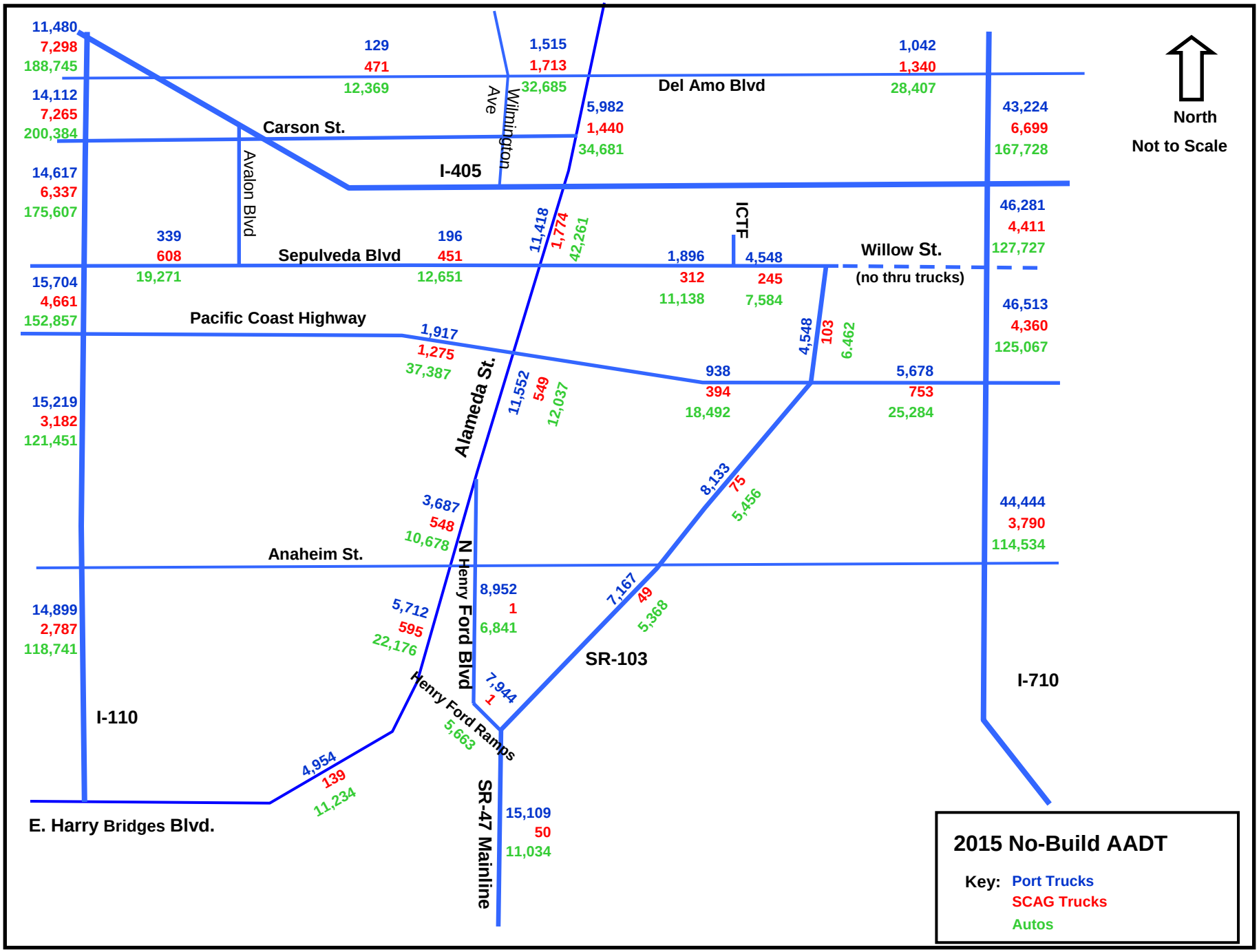
2,724
295
12,476
11,503
202
5,619
2003 Baseline AADT
Key: Port Trucks
SCAG Trucks
Autos


North
Not to Scale
Del Amo Blvd
Carson St.
I-405
Avalon Blvd
Wilmington Ave
Sepulveda Blvd
ICTF
Willow St.
(no thru trucks)
Pacific Coast Highway
Alameda St.
Anaheim St.
N Henry Ford Blvd
Henry Ford Ramps
SR-103
I-110
I-710
E. Harry Bridges Blvd.
SR-47 Mainline
11,480
7,298
188,745
129
471
12,369
1,515
1,713
32,685
1,042
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28,407
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49
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11,234
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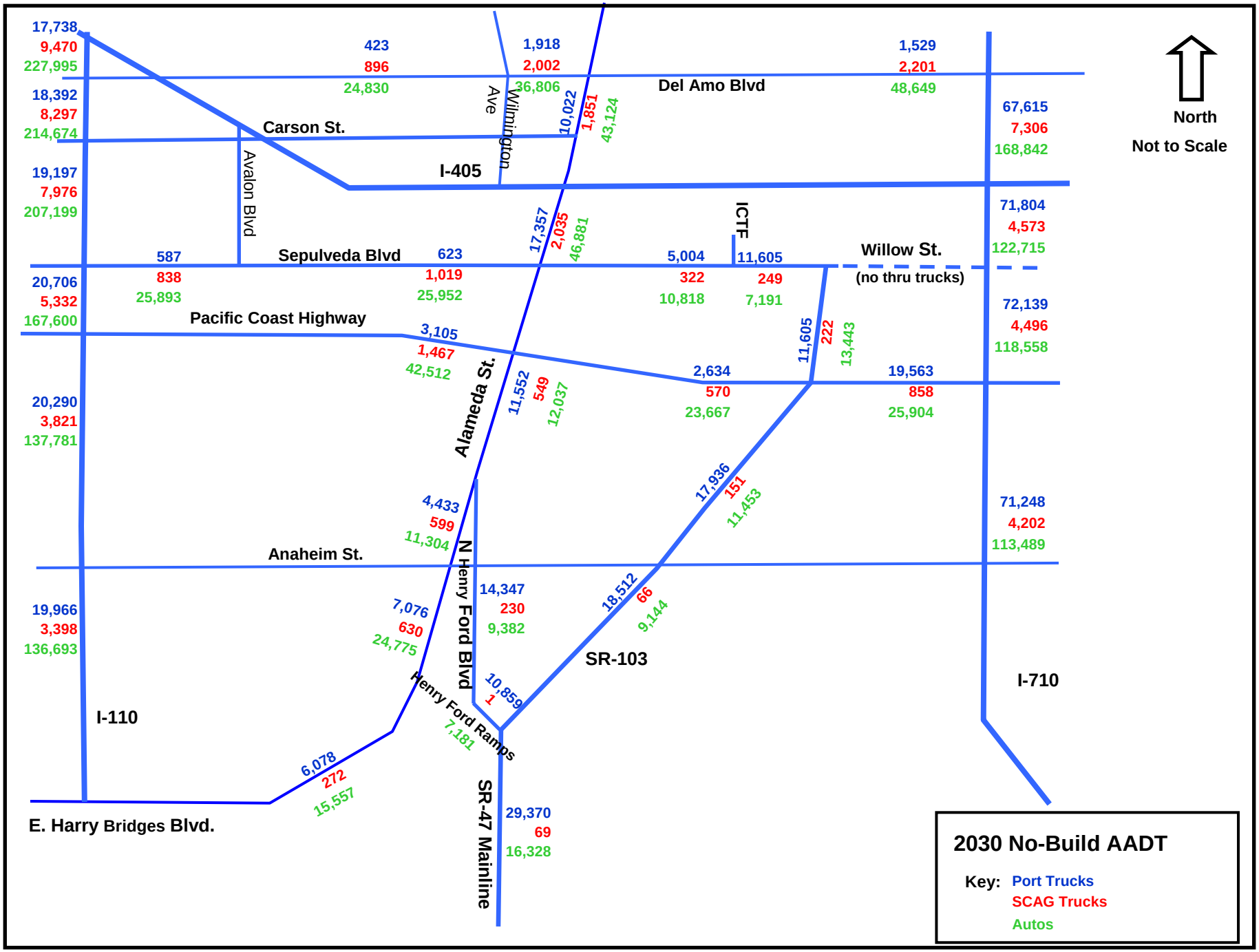
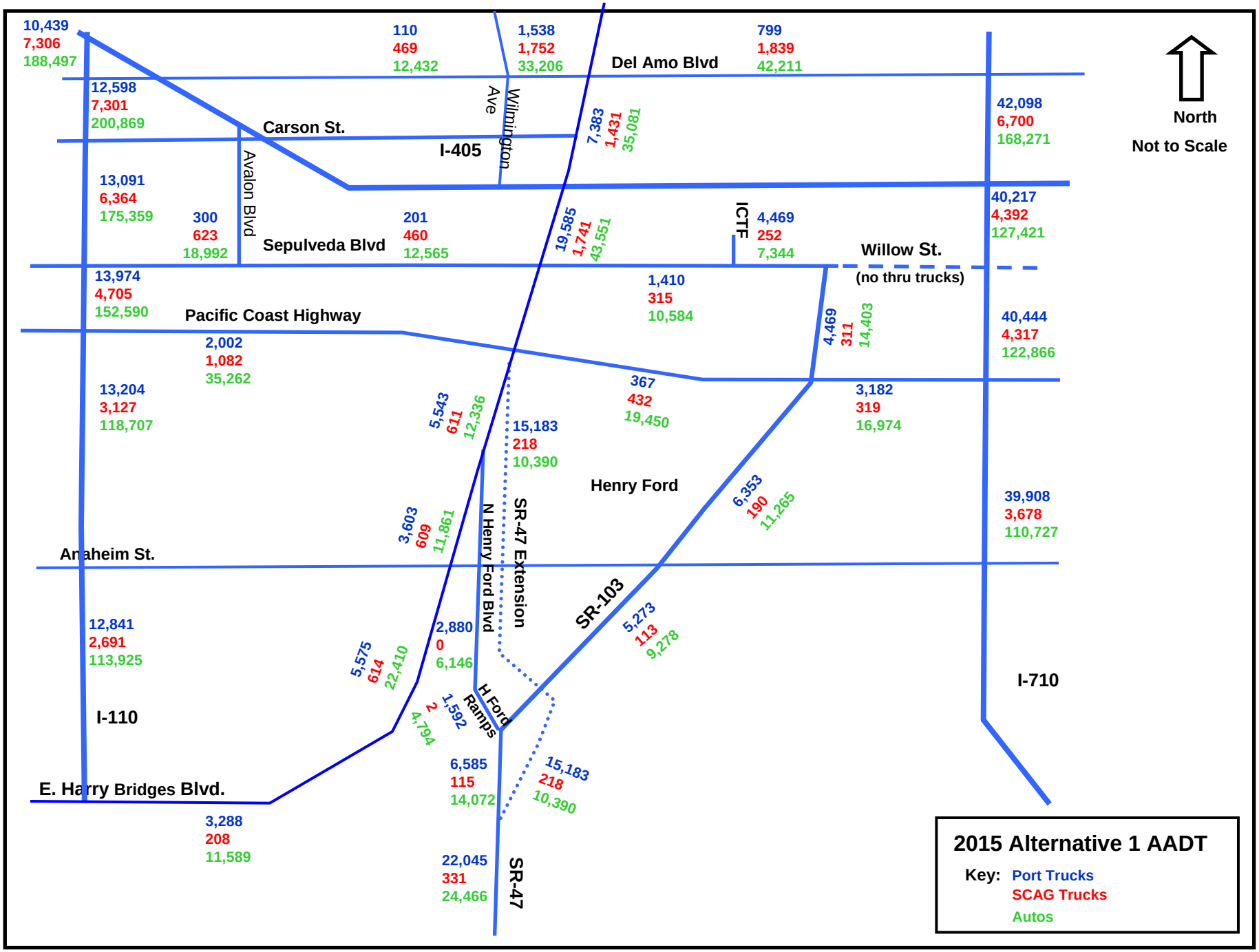
11,034
2015 No-Build AADT
Key: Port Trucks
SCAG Trucks
Autos


North
Not to Scale
Del Amo Blvd
Carson St.
I-405
Avalon Blvd
Wilmington Ave
Sepulveda Blvd
ICTF
Willow St.
(no thru trucks)
Pacific Coast Highway
Alameda St.
Anaheim St.
N Henry Ford Blvd
Henry Ford Ramps
SR-103
I-110
I-710
E. Harry Bridges Blvd.
SR-47 Mainline
17,738
9,470
227,995
423
896
24,830
1,918
2,002
36,806
1,529
2,201
48,649
18,392
8,297
214,674
10,022
1,851
43,124
67,615
7,306
168,842
19,197
7,976
207,199
71,804
4,573
122,715
17,357
2,035
46,881
587
838
25,893
623
1,019
25,952
5,004
322
10,818
11,605
249
7,191
20,706
5,332
167,600
72,139
4,496
118,558
3,105
1,467
42,512
11,605
222
13,443
2,634
570
23,667
19,563
858
25,904
20,290
3,821
137,781
11,552
549
12,037
17,936
151
11,453
4,433
599
11,304
71,248
4,202
113,489
14,347
230
9,382
19,966
3,398
136,693
7,076
630
24,775
18,512
66
9,144
10,859
1
7,181
6,078
272
15,557
29,370
69
16,328
2030 No-Build AADT
Key: Port Trucks
SCAG Trucks
Autos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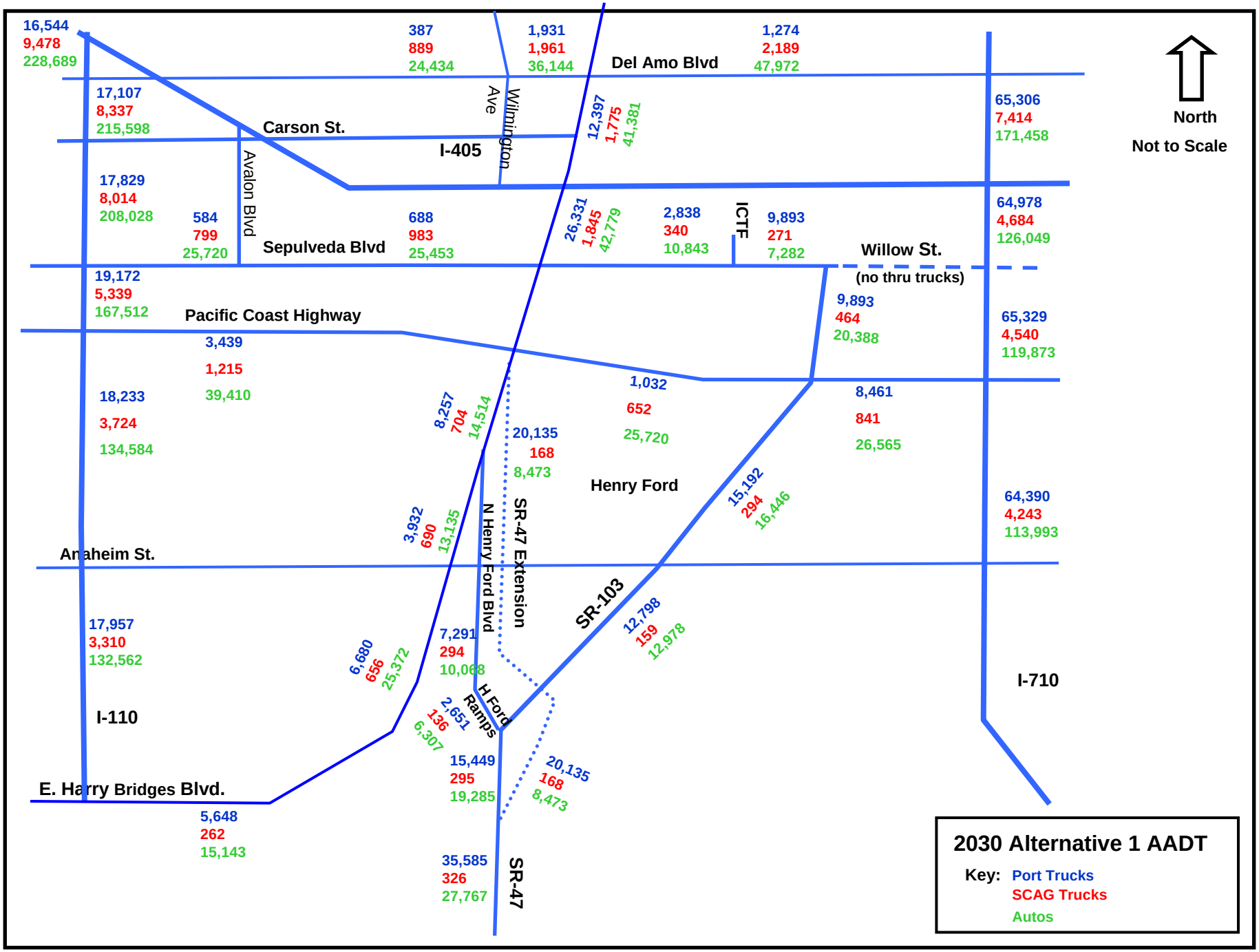
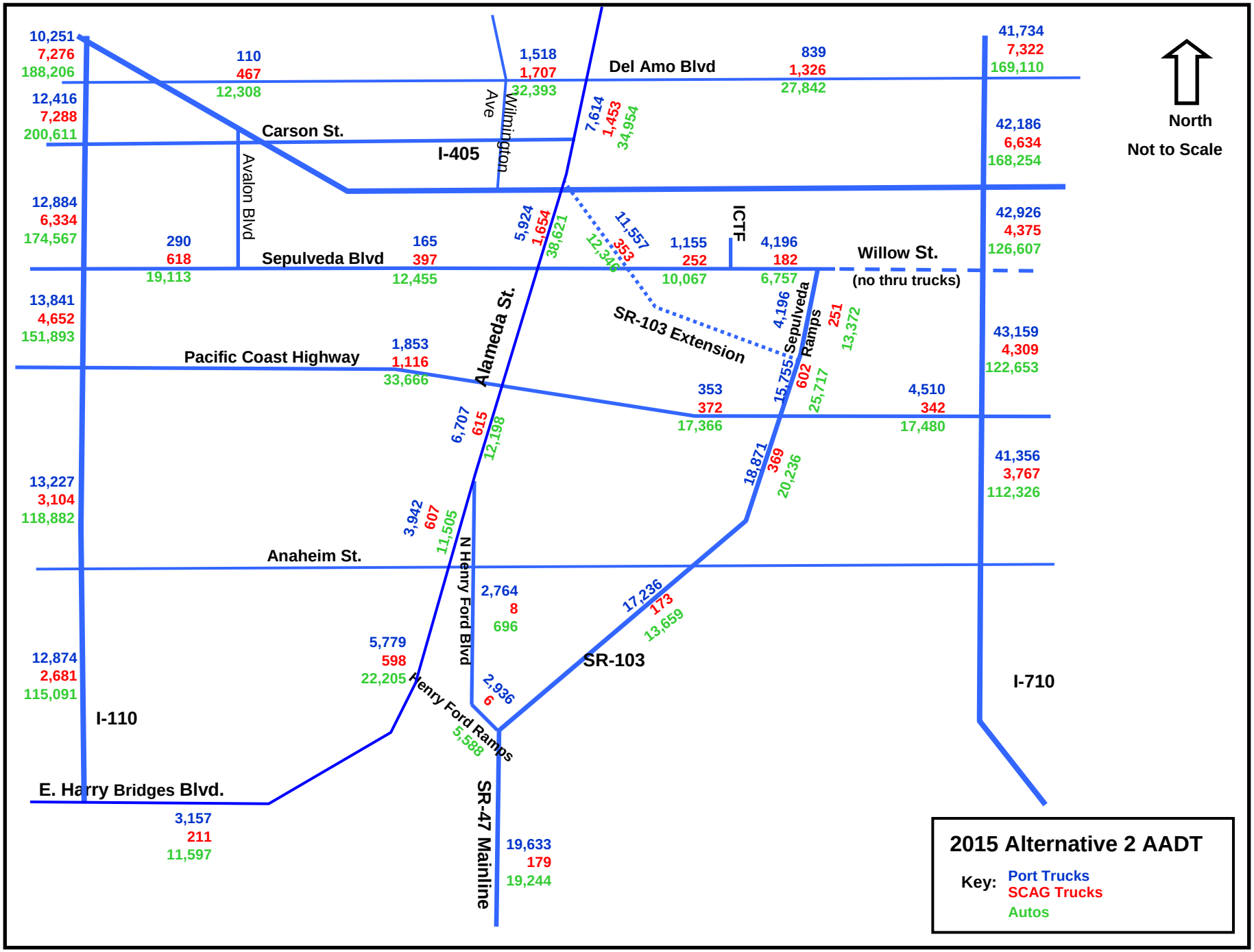
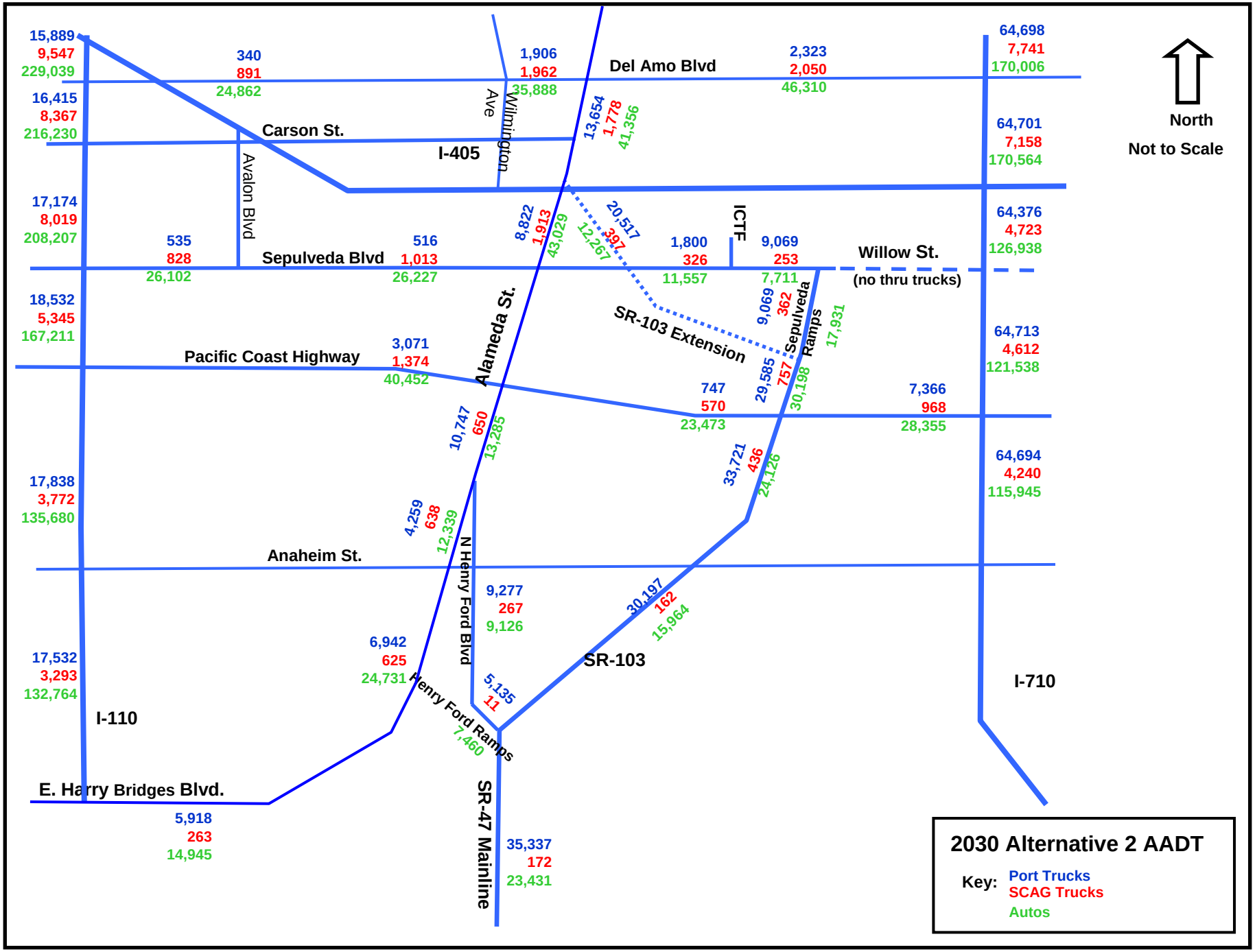
7,306
188,497
110
469
12,432
1,538
1,752
33,206
Del Amo Blvd
799
1,839
42,211
North
Not to Scale
12,598
7,301
200,869
Carson St.
Avalon Blvd
Wilmington Ave
I-405
7,383
1,431
35,081
42,098
6,700
168,271
13,091
6,364
175,359
300
623
18,992
Sepulveda Blvd
201
460
12,565
19,585
1,741
43,551
ICTF
4,469
252
7,344
40,217
4,392
127,421
Willow St.
(no thru trucks)
13,974
4,705
152,590
Pacific Coast Highway
1,410
315
10,584
4,469
311
14,403
40,444
4,317
122,866
2,002
1,082
35,262
13,204
3,127
118,707
5,543
611
12,336
367
432
19,450
3,182
319
16,974
15,183
218
10,390
Henry Ford
6,353
190
11,265
39,908
3,678
110,727
3,603
609
11,861
N Henry Ford Blvd
SR-47 Extension
Anaheim St.
SR-103
5,273
113
9,278
12,841
2,691
113,925
2,880
0
6,146
5,575
614
22,410
I-710
I-110
H Ford Ramps
2
1,592
4,794
6,585
115
14,072
15,183
218
10,390
E. Harry Bridges Blvd.
3,288
208
11,589
22,045
331
24,466
SR-47
2015 Alternative 1 AADT
Key: Port Trucks
SCAG Trucks
Autos


16,544
9,478
228,689
387
889
24,434
1,931
1,961
36,144
Del Amo Blvd
1,274
2,189
47,972
North
Not to Scale
17,107
8,337
215,598
Carson St.
Wilmington Ave
12,397
1,775
41,381
65,306
7,414
171,458
I-405
17,829
8,014
208,028
Avalon Blvd
584
799
25,720
Sepulveda Blvd
688
983
25,453
26,331
1,845
42,779
2,838
340
10,843
ICTF
9,893
271
7,282
64,978
4,684
126,049
Willow St.
(no thru trucks)
19,172
5,339
167,512
Pacific Coast Highway
9,893
464
20,388
65,329
4,540
119,873
3,439
1,215
39,410
1,032
652
25,720
8,461
841
26,565
18,233
3,724
134,584
8,257
704
14,514
20,135
168
8,473
Henry Ford
15,192
294
16,446
64,390
4,243
113,993
3,932
690
13,135
N Henry Ford Blvd
SR-47 Extension
Anaheim St.
SR-103
12,798
159
12,978
17,957
3,310
132,562
7,291
294
10,068
6,680
656
25,372
I-710
H Ford Ramps
2,651
136
6,307
I-110
15,449
295
19,285
20,135
168
8,473
E. Harry Bridges Blvd.
5,648
262
15,143
35,585
326
27,767
SR-47
2030 Alternative 1 AADT
Key: Port Trucks
SCAG Trucks
Autos


North
Not to Scale
Del Amo Blvd
Carson St.
I-405
Wilmington Ave
Avalon Blvd
Sepulveda Blvd
ICTF
Willow St.
(no thru trucks)
Alameda St.
SR-103 Extension
Sepulveda Ramps
Pacific Coast Highway
Anaheim St.
N Henry Ford Blvd
Henry Ford Ramps
SR-103
I-110
I-710
E. Harry Bridges Blvd.
SR-47 Mainline
10,251
7,276
188,206
110
467
12,308
1,518
1,707
32,393
839
1,326
27,842
41,734
7,322
169,110
12,416
7,288
200,611
7,614
1,453
34,954
42,186
6,634
168,254
12,884
6,334
174,567
5,924
1,654
38,621
11,557
353
12,346
42,926
4,375
126,607
290
618
19,113
165
397
12,455
1,155
252
10,067
4,196
182
6,757
13,841
4,652
151,893
4,196
251
13,372
43,159
4,309
122,653
1,853
1,116
33,666
353
372
17,366
15,755
602
25,717
4,510
342
17,480
6,707
615
12,198
18,871
369
20,236
41,356
3,767
112,326
13,227
3,104
118,882
3,942
607
11,505
2,764
8
696
17,236
173
13,659
5,779
598
22,205
12,874
2,681
115,091
2,936
6
5,588
3,157
211
11,597
19,633
179
19,244
2015 Alternative 2 AADT
Key:
Port Trucks
SCAG Trucks
Autos


North
Not to Scale
Del Amo Blvd
Carson St.
I-405
Wilmington Ave
Avalon Blvd
Sepulveda Blvd
ICTF
Willow St.
(no thru trucks)
Alameda St.
SR-103 Extension
Sepulveda Ramps
Pacific Coast Highway
Anaheim St.
N Henry Ford Blvd
Henry Ford Ramps
SR-103
I-110
I-710
E. Harry Bridges Blvd.
SR-47 Mainline
15,889
9,547
229,039
340
891
24,862
1,906
1,962
35,888
2,323
2,050
46,310
64,698
7,741
170,006
16,415
8,367
216,230
13,654
1,778
41,356
64,701
7,158
170,564
17,174
8,019
208,207
8,822
1,913
43,029
20,517
397
12,267
64,376
4,723
126,938
535
828
26,102
516
1,013
26,227
1,800
326
11,557
9,069
253
7,711
18,532
5,345
167,211
9,069
362
17,931
64,713
4,612
121,538
3,071
1,374
40,452
29,585
757
30,198
747
570
23,473
7,366
968
28,355
10,747
650
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33,721
436
24,126
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4,240
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17,838
3,772
135,680
4,259
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12,339
9,277
267
9,126
30,197
162
15,964
6,942
625
24,731
17,532
3,293
132,764
5,135
11
7,460
5,918
263
14,945
35,337
172
23,431
2030 Alternative 2 AADT
Key:
Port Trucks
SCAG Trucks
Autos

SR-47 Traffic Data
Existing 2003 AADT Counts

Scenario / Road Segments	ADT Total			ADT					
				Autos		Port Trucks		SCAG Trucks	
	Auto	PORT	SCAG	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
Existing 2003									
SR-47 Mainline, New Dock Ramps to HF Ramps	5619	11503	202	2,751	2,868	5,930	5,573	94	108
Henry Ford Ramps	2791	4324	1	1,455	1,336	2,556	1,768	0	1
Henry Ford n/o Ramps to Alameda	11041	4930	618	5,038	6,003	3,016	1,914	273	345
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	2826	7177	198	1,296	1,530	3,373	3,804	94	104
SR-103 Anaheim to PCH	2758	7699	236	1,338	1,420	4,175	3,524	142	94
SR-103 PCH to Sepulveda/Willow	1956	5581	229	776	1,180	2,417	3,164	103	126
E and W Harry Bridges, Figueroa to start Alameda	12476	2724	295	6,192	6,284	1,049	1,675	152	143
Alameda beginning (E Harry Bridges) to Anaheim	16305	2984	476	8,264	8,041	1,133	1,851	233	243
Alameda Anaheim to Henry Ford	11577	1758	450	5,969	5,608	779	979	250	200
Alameda Henry Ford to PCH	16262	5695	798	8,103	8,159	2,915	2,780	411	387
Alameda PCH to 405	45994	4626	3008	22,633	23,361	2,434	2,192	1,514	1,494
Alameda 405 to del Amo	38347	2519	1659	20,336	18,011	1,476	1,043	904	755
Alameda, del Amo to South Santa Fe Avenue	27874	1310	1360	15,711	12,163	695	615	746	614
Alameda, South Santa Fe Avenue to SR-91	39859	704	2497	20,148	19,711	405	299	1,273	1,224
I-110, "C" Street Interchange to Anaheim	114025	10888	3337	57,336	56,689	5,609	5,279	1,668	1,669
I-110, Anaheim to PCH	124001	10851	3771	61,485	62,516	5,582	5,269	1,845	1,926
1-110, PCH to Sepulveda	158807	10729	5314	78,278	80,529	5,423	5,306	2,616	2,698
I-110, Sepulveda to Carson	185234	10066	6929	95,728	89,506	5,066	5,000	3,664	3,265
I-110, Carson to Del Amo	212999	9572	8147	105,076	107,923	4,832	4,740	4,117	4,030
I-110, Del Amo to 405	226868	9279	9024	110,910	115,958	4,683	4,596	4,499	4,525
I-110, 405 to SR-91	256494	7762	12531	165,435	91,059	4,021	3,741	8,733	3,798
I-710, Anaheim to PCH	109345	25330	4612	49,255	60,090	12,668	12,662	2,127	2,485
I-710, PCH to Willow	125268	27542	5600	60,108	65,160	14,344	13,198	2,770	2,830
I-710, Willow to 405	133369	27498	5840	63,209	70,160	14,313	13,185	2,895	2,945
I-710, 405 to Del Amo	184078	24309	8953	96,711	87,367	12,783	11,526	4,555	4,398
I-710, Del Amo to Long Beach Blvd Interchange	183027	23381	9758	96,345	86,682	12,308	11,073	4,974	4,784
I-710, Long Beach Boulevard to SR-91	195662	22970	10517	93,886	101,776	11,995	10,975	4,832	5,685
PCH, I110 to Alameda	38187	1498	1298	18,096	20,091	816	682	615	683
PCH, Alameda to SR-103	19435	368	547	8,769	10,666	197	171	234	313
PCH, SR-103 to I-710	30873	5762	1390	16,296	14,577	3,593	2,169	695	695
Sepulveda, I-110 to Avalon	24978	129	801	12,272	12,706	54	75	373	428
Sepulveda, Avalon to Alameda	20622	182	791	10,310	10,312	89	93	395	396
Sepulveda, Alameda to ICTF	21177	1224	555	10,672	10,505	537	687	278	277
Sepulveda, ICTF to SR-103	20521	5581	561	10,378	10,143	3,164	2,417	275	286
Del Amo, I-110 to Wilmington**	0	0	0						
Del Amo, Wilmington to Alameda	20778	110	1428	9,875	10,903	23	87	598	830
Del Amo, Alameda to I-710	55156	813	2952	26,933	28,223	476	337	1,469	1,483
223rd Street, I-110 to Avalon	22468	122	734	11,243	11,225	29	93	403	331
223rd Street, Avalon to Wilmington	19480	122	678	10,291	9,189	54	68	383	295
223rd Street, Wilmington to Alameda	13628	234	479	5,290	8,338	231	3	171	308
W Wardlow from Alameda to I-710	18090	89	551	9,961	8,129	8	81	319	232

****DEL AMO LINK EAST OF 110, BETWEEN MAIN AND WILMINGTON, DID NOT EXIST IN 2003**

SR-47 Traffic Data
2015 No-Build AADT Counts

Scenario / Road Segments	ADT			ADT					
				Autos		Port Trucks		SCAG Trucks	
	Autos	Port	SCAG	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
Baseline 2015									
SR-47 Mainline, New Dock Ramps to HF Ramps	11034	15109	50	5,179	5,855	8,053	7,056	19	31
Henry Ford Ramps	5663	7944	1	2,461	3,202	4,089	3,855	0	1
Henry Ford n/o Ramps to Alameda	6841	8952	1	2,965	3,876	4,631	4,321	0	1
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	5368	7167	49	2,717	2,651	3,963	3,204	19	30
SR-103 Anaheim to PCH	5456	8133	75	2,845	2,611	4,383	3,750	45	30
SR-103 PCH to Sepulveda/Willow	6462	4548	103	2,718	3,744	2,298	2,250	45	58
E and W Harry Bridges, Figueroa to start Alameda	11234	4954	139	5,514	5,720	2,273	2,681	57	82
Alameda beginning (E Harry Bridges) to Anaheim	22176	5712	595	10,942	11,234	2,873	2,839	282	313
Alameda Anaheim to Henry Ford	10678	3687	548	4,086	6,592	1,677	2,010	218	330
Alameda Henry Ford to PCH	12037	11552	549	4,684	7,353	5,879	5,673	218	331
Alameda PCH to 405	42261	11418	1774	19,663	22,598	5,914	5,504	787	987
Alameda 405 to del Amo	34681	5982	1440	17,816	16,865	2,888	3,094	715	725
Alameda, del Amo to South Santa Fe Avenue	20740	3567	878	11,477	9,263	1,945	1,622	480	398
Alameda, South Santa Fe Avenue to SR-91	17430	3372	751	9,790	7,640	1,855	1,517	424	327
I-110, "C" Street Interchange to Anaheim	118741	14899	2787	57,590	61,151	8,482	6,417	1,285	1,502
I-110, Anaheim to PCH	121451	15219	3182	58,892	62,559	8,702	6,517	1,457	1,725
1-110, PCH to Sepulveda	152857	15704	4661	75,194	77,663	8,894	6,810	2,243	2,418
I-110, Sepulveda to Carson	175067	14617	6337	89,111	85,956	8,236	6,381	3,230	3,107
I-110, Carson to Del Amo	200384	14112	7265	97,131	103,253	7,995	6,117	3,552	3,713
I-110, Del Amo to 405	188745	11480	7298	78,381	110,364	5,584	5,896	3,220	4,078
I-110, 405 to SR-91	238636	10629	11410	153,165	85,471	6,202	4,427	8,015	3,395
I-710, Anaheim to PCH	114534	44444	3790	53,318	61,216	22,716	21,728	1,753	2,037
I-710, PCH to Willow	125067	46513	4360	60,809	64,258	23,967	22,546	2,201	2,159
I-710, Willow to 405	127727	46281	4411	60,292	67,435	23,741	22,540	2,184	2,227
I-710, 405 to Del Amo	167728	43224	6699	87,454	80,274	22,370	20,854	3,522	3,177
I-710, Del Amo to Long Beach Blvd Interchange	168517	42268	7372	87,274	81,243	21,846	20,422	3,790	3,582
I-710, Long Beach Boulevard to SR-91	177292	41703	7598	84,892	92,400	21,320	20,383	3,709	3,889
PCH, I110 to Alameda	37387	1917	1275	17,982	19,405	1,140	777	597	678
PCH, Alameda to SR-103	18492	938	394	8,173	10,319	594	344	182	212
PCH, SR-103 to I-710	25284	5678	753	12,976	12,308	3,484	2,194	476	277
Sepulveda, I-110 to Avalon	19271	339	608	9,764	9,507	286	53	296	312
Sepulveda, Avalon to Alameda	12651	196	451	6,286	6,365	181	15	200	251
Sepulveda, Alameda to ICTF	11138	1896	312	6,014	5,124	953	943	150	162
Sepulveda, ICTF to SR-103	7584	4548	245	4,398	3,186	2,250	2,298	118	127
Del Amo, I-110 to Wilmington	12369	129	471	6,588	5,781	93	36	276	195
Del Amo, Wilminton to Alameda	32685	1515	1713	16,213	16,472	816	699	846	867
Del Amo, Alameda to I-710	28407	1042	1340	13,726	14,681	469	573	619	721
223rd Street, I-110 to Avalon	20033	64	551	9,803	10,230	41	23	289	262
223rd Street, Avalon to Wilmington	13782	59	510	8,471	5,311	59	0	343	167
223rd Street, Wilmington to Alameda	14322	619	789	8,509	5,813	548	71	436	353
W Wardlow from Alameda to I-710	11783	166	353	2,003	9,780	8	158	52	301

SR-47 Traffic Data
2030 No-Build AADT Counts

Scenario / Road Segments	ADT			ADT					
				Autos		Port Trucks		SCAG Trucks	
	Autos	Port	SCAG	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
Baseline 2030									
SR-47 Mainline, New Dock Ramps to HF Ramps	16328	29370	69	8,011	8,317	15,429	13,941	39	30
Henry Ford Ramps	7181	10859	1	3,211	3,970	5,955	4,904	0	1
Henry Ford n/o Ramps to Alameda	9382	14347	230	4,431	4,951	8,000	6,347	226	4
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	9144	18512	66	4,799	4,345	9,475	9,037	37	29
SR-103 Anaheim to PCH	11453	17936	151	7,317	4,136	10,442	7,494	123	28
SR-103 PCH to Sepulveda/Willow	13443	11605	222	7,117	6,326	6,512	5,093	119	103
E and W Harry Bridges, Figueroa to start Alameda	15557	6078	272	7,579	7,978	2,809	3,269	102	170
Alameda beginning (E Harry Bridges) to Anaheim	24775	7076	630	11,988	12,787	3,568	3,508	285	345
Alameda Anaheim to Henry Ford	11304	4433	599	4,122	7,182	1,889	2,544	229	370
Alameda Henry Ford to PCH	12403	16015	597	4,431	7,972	8,000	8,015	226	371
Alameda PCH to 405	46881	17357	2035	20,962	25,919	9,605	7,752	909	1,126
Alameda 405 to del Amo	43124	10022	1851	22,353	20,771	5,011	5,011	982	869
Alameda, del Amo to South Santa Fe Avenue	29565	7232	1311	15,718	13,847	3,931	3,301	674	637
Alameda, South Santa Fe Avenue to SR-91	22466	5629	985	12,255	10,211	2,974	2,655	519	466
I-110, "C" Street Interchange to Anaheim	136693	19966	3398	65,792	70,901	11,406	8,560	1,551	1,847
I-110, Anaheim to PCH	137781	20290	3821	66,070	71,711	11,599	8,691	1,722	2,099
1-110, PCH to Sepulveda	167600	20706	5332	81,378	86,222	11,660	9,046	2,513	2,819
I-110, Sepulveda to Carson	207199	19197	7976	104,009	103,190	10,871	8,326	4,036	3,940
I-110, Carson to Del Amo	214674	18392	8297	104,009	110,665	10,456	7,936	4,036	4,261
I-110, Del Amo to 405	227995	17738	9470	109,355	118,640	10,135	7,603	4,737	4,733
I-110, 405 to SR-91	257149	14615	13556	163,996	93,153	8,676	5,939	9,566	3,990
I-710, Anaheim to PCH	113489	71248	4202	53,080	60,409	36,860	34,388	2,003	2,199
I-710, PCH to Willow	118558	72139	4496	56,371	62,187	36,204	35,935	2,207	2,289
I-710, Willow to 405	122715	71804	4573	56,057	66,658	35,869	35,935	2,194	2,379
I-710, 405 to Del Amo	168842	67615	7306	86,885	81,957	34,317	33,298	3,811	3,495
I-710, Del Amo to Long Beach Blvd Interchange	169420	66070	8000	87,157	82,263	33,601	32,469	4,083	3,917
I-710, Long Beach Boulevard to SR-91	218049	65231	11993	106,760	111,289	32,809	32,422	5,836	6,157
PCH, I110 to Alameda	42512	3105	1467	20,737	21,775	2,086	1,019	706	761
PCH, Alameda to SR-103	23667	2634	570	10,818	12,849	1,603	1,031	248	322
PCH, SR-103 to I-710	25904	19563	858	12,327	13,577	5,986	13,577	471	387
Sepulveda, I-110 to Avalon	25893	587	838	12,717	13,176	437	150	412	426
Sepulveda, Avalon to Alameda	25952	623	1019	12,928	13,024	492	131	495	524
Sepulveda, Alameda to ICTF	10818	5004	322	5,886	4,932	1,810	3,194	171	151
Sepulveda, ICTF to SR-103	7191	11605	249	4,179	3,012	5,093	6,512	135	114
Del Amo, I-110 to Wilmington	24830	423	896	11,794	13,036	216	207	463	433
Del Amo, Wilminton to Alameda	36806	1918	2002	17,653	19,153	1,110	808	923	1,079
Del Amo, Alameda to I-710	48649	1529	2201	23,562	25,087	723	806	1,050	1,151
223rd Street, I-110 to Avalon	25206	151	744	12,365	12,841	84	67	395	349
223rd Street, Avalon to Wilmington	17782	105	599	9,872	7,910	100	5	350	249
223rd Street, Wilmington to Alameda	20883	1227	1136	9,016	11,867	381	846	469	667
W Wardlow from Alameda to I-710	36501	3672	1493	16,370	20,131	2,958	714	914	579

SR-47 Traffic Data
2015 Alternative 1 AADT Counts

Scenario / Road Segments	ADT			ADT					
				Autos		Port Trucks		SCAG Trucks	
	Autos	Port	SCAG	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
Alternative 1, 2015									
SR-47 Mainline, New Dock Ramps to HF Ramps	24,466	22,045	331	11,487	12,979	11,970	10,075	132	199
Henry Ford Ramps (Actually is HF+103 Traffic)	14,072	6,865	115	6,529	7,543	3,734	3,131	57	58
Henry Ford n/o Ramps to Alameda	6,146	2,880	0	2,793	3,353	1,633	1,247	0	0
SR-47 Extension, HF Ramps to Alameda	10,390	15,183	218	4,955	5,435	8,238	6,945	76	142
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	9,278	5,273	113	4,340	4,938	2,961	2,312	55	58
SR-103 Anaheim to PCH	11,265	6,353	190	6,334	4,931	3,456	2,897	132	58
SR-103 PCH to Sepulveda/Willow	14,403	4,469	311	6,979	7,424	2,310	2,159	178	133
E and W Harry Bridges, Figueroa to start Alameda	11,589	3,288	208	5,584	6,005	1,744	1,544	80	128
Alameda beginning (E Harry Bridges) to Anaheim	22,410	5,575	614	11,312	11,098	2,957	2,618	303	311
Alameda Anaheim to Henry Ford	11,861	3,603	609	4,911	6,950	1,836	1,767	264	345
Alameda, Henry Ford to PCH	12,336	5,543	611	5,111	7,225	3,120	2,423	264	347
Alameda PCH to 405	43,551	19,585	1,741	21,099	22,452	10,810	8,775	814	927
Alameda 405 to del Amo	35,081	7,383	1,431	17,870	17,211	3,697	3,686	716	715
Alameda, del Amo to South Santa Fe Avenue	20,335	4,682	865	11,207	9,128	2,604	2,078	482	383
Alameda, South Santa Fe Avenue to SR-91	17,042	4,438	731	9,491	7,551	2,499	1,939	413	318
I-110, "C" Street Interchange to Anaheim	113,925	12,841	2,691	54,717	59,208	7,262	5,579	1,228	1,463
I-110, Anaheim to PCH	118,707	13,204	3,127	57,153	61,554	7,492	5,712	1,424	1,703
1-110, PCH to Sepulveda	152,590	13,974	4,705	74,652	77,938	7,931	6,043	2,251	2,454
I-110, Sepulveda to Carson	175,359	13,091	6,364	89,551	85,808	7,392	5,699	3,270	3,094
I-110, Carson to Del Amo	200,869	12,598	7,301	97,666	103,203	7,136	5,462	3,583	3,718
I-110, Del Amo to 405	188,497	10,439	7,306	78,334	110,163	5,136	5,303	3,215	4,091
I-110, 405 to SR-91	238,892	10,249	11,392	153,770	85,122	6,081	4,168	7,973	3,419
I-710, Anaheim to PCH	110,727	39,908	3,678	52,316	58,411	19,672	20,236	1,725	1,953
I-710, PCH to Willow	122,866	40,444	4,317	60,586	62,280	20,136	20,308	2,211	2,106
I-710, Willow to 405	127,421	40,217	4,392	60,520	66,901	19,911	20,306	2,194	2,198
I-710, 405 to Del Amo	168,271	42,098	6,700	87,981	80,290	21,714	20,384	3,536	3,164
I-710, Del Amo to Long Beach Blvd Interchange	169,335	41,376	7,392	87,938	81,397	21,301	20,075	3,804	3,588
I-710, Long Beach Boulevard to SR-91	177,257	41,078	7,589	85,148	92,109	21,044	20,034	3,710	3,879
PCH, I110 to Alameda	35,262	2,002	1,082	17,435	17,827	1,100	902	539	543
PCH, Alameda to SR-103	19,450	367	432	9,088	10,362	308	59	204	228
PCH, SR-103 to I-710	16,974	3,182	319	8,093	8,881	1,918	1,264	159	160
Sepulveda, I-110 to Avalon	18,992	300	623	9,500	9,492	225	75	288	335
Sepulveda, Avalon to Alameda	12,565	201	460	6,366	6,199	176	25	225	235
Sepulveda, Alameda to ICTF	10,584	1,410	315	5,035	5,549	659	751	141	174
Sepulveda, ICTF to SR-103	7,344	4,469	252	3,479	3,865	2,159	2,310	109	143
Del Amo, I-110 to Wilmington	12,432	110	469	6,563	5,869	72	38	273	196
Del Amo, Wilminton to Alameda	33,206	1,538	1,752	16,279	16,927	821	717	854	898
Del Amo, Alameda to I-710	42,211	799	1,839	19,851	22,360	337	462	846	993
223rd Street, I-110 to Avalon	20,029	71	549	9,877	10,152	40	31	289	260
223rd Street, Avalon to Wilmington	14,274	56	508	8,587	5,687	56	0	342	166
223rd Street, Wilmington to Alameda	15,154	1,173	805	9,172	5,982	567	606	457	348
W Wardlow from Alameda to I-710	10,649	829	503	5,123	5,526	656	173	304	199

SR-47 Traffic Data
2030 Alternative 1 AADT Counts

Scenario / Road Segments	ADT			ADT					
				Autos		Port Trucks		SCAG Trucks	
	Autos	Port	SCAG	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
Alternative 1, 2030									
SR-47 Mainline, New Dock Ramps to HF Ramps	27,767	35,585	326	12,555	15,212	17,881	17,704	119	207
Henry Ford Ramps (Actually is HF + 103 Traffiic)	19,285	15,449	295	9,220	10,065	7,457	7,992	88	207
Henry Ford n/o Ramps to Alameda	10,068	7,291	294	5,472	4,596	4,361	2,930	280	14
SR-47 Extension, HF Ramps to Alameda	8,473	20,135	168	3,331	5,142	10,424	9,711	32	136
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	12,978	12,798	159	6,327	6,651	6,001	6,797	88	71
SR-103 Anaheim to PCH	16,446	15,192	294	9,965	6,481	7,372	7,820	224	70
SR-103 PCH to Sepulveda/Willow	20,388	9,893	464	10,159	10,229	5,007	4,886	251	213
E and W Harry Bridges, Figueroa to start Alameda	15,143	5,648	262	7,327	7,816	2,827	2,821	92	170
Alameda beginning (E Harry Bridges) to Anaheim	25,372	6,680	656	12,240	13,132	3,604	3,076	296	360
Alameda Anaheim to Henry Ford	13,135	3,932	690	5,129	8,006	1,865	2,067	280	410
Alameda, Henry Ford to PCH	14,514	8,527	704	5,472	9,042	4,361	4,166	280	424
Alameda PCH to 405	42,779	26,331	1,845	18,373	24,406	13,805	12,526	780	1,065
Alameda 405 to del Amo	41,381	12,397	1,775	22,078	19,303	6,429	5,968	914	861
Alameda, del Amo to South Santa Fe Avenue	27,756	8,964	1,204	15,423	12,333	4,997	3,967	643	561
Alameda, South Santa Fe Avenue to SR-91	21,886	7,052	941	12,280	9,606	3,862	3,190	520	421
I-110, "C" Street Interchange to Anaheim	132,562	17,957	3,310	63,988	68,574	9,996	7,961	1,504	1,806
I-110, Anaheim to PCH	134,584	18,233	3,724	64,971	69,613	10,182	8,051	1,682	2,042
1-110, PCH to Sepulveda	167,512	19,172	5,339	81,190	86,322	10,703	8,469	2,504	2,835
I-110, Sepulveda to Carson	208,028	17,829	8,014	104,812	103,216	9,906	7,923	4,062	3,952
I-110, Carson to Del Amo	215,598	17,107	8,337	104,812	110,786	9,564	7,543	4,062	4,275
I-110, Del Amo to 405	228,689	16,544	9,478	109,585	119,104	9,277	7,267	4,744	4,734
I-110, 405 to SR-91	257,876	14,181	13,565	164,432	93,444	8,397	5,784	9,577	3,988
I-710, Anaheim to PCH	113,993	64,390	4,243	54,599	59,394	33,956	30,434	2,054	2,189
I-710, PCH to Willow	119,873	65,329	4,540	58,802	61,071	33,374	31,955	2,291	2,249
I-710, Willow to 405	126,049	64,978	4,684	58,584	67,465	33,027	31,951	2,279	2,405
I-710, 405 to Del Amo	171,458	65,306	7,414	88,447	83,011	33,170	32,136	3,900	3,514
I-710, Del Amo to Long Beach Blvd Interchange	170,964	64,177	8,066	87,735	83,229	32,621	31,556	4,122	3,944
I-710, Long Beach Boulevard to SR-91	217,092	63,776	11,802	106,172	110,920	32,151	31,625	5,706	6,096
PCH, I110 to Alameda	39,410	3,439	1,215	19,424	19,986	2,164	1,275	595	620
PCH, Alameda to SR-103	25,720	1,032	652	11,833	13,887	847	185	283	369
PCH, SR-103 to I-710	26,565	8,461	841	13,609	12,956	4,396	4,065	508	333
Sepulveda, I-110 to Avalon	25,720	584	799	12,659	13,061	502	82	395	404
Sepulveda, Avalon to Alameda	25,453	688	983	12,614	12,839	588	100	481	502
Sepulveda, Alameda to ICTF	10,843	2,838	340	5,469	5,374	1,377	1,461	167	173
Sepulveda, ICTF to SR-103	7,282	9,893	271	3,817	3,465	4,886	5,007	134	137
Del Amo, I-110 to Wilmington	24,434	387	889	11,650	12,784	197	190	460	429
Del Amo, Wilminton to Alameda	36,144	1,931	1,961	17,125	19,019	1,089	842	908	1,053
Del Amo, Alameda to I-710	47,972	1,274	2,189	22,623	25,349	581	693	996	1,193
223rd Street, I-110 to Avalon	25,122	196	775	12,341	12,781	78	118	402	373
223rd Street, Avalon to Wilmington	17,431	103	590	9,910	7,521	96	7	355	235
223rd Street, Wilmington to Alameda	20,968	1,776	1,157	8,368	12,600	1,013	763	430	727
W Wardlow from Alameda to I-710	36,001	6,325	1,426	15,755	20,246	4,944	1,381	799	627

SR-47 Traffic Data
2015 Alternative 2 AADT Counts

Scenario / Road Segments	ADT			ADT					
				Autos		Port Trucks		SCAG Trucks	
	Auto	Port	SCAG	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
2015, Alternative 2									
SR-47 Mainline, New Dock Ramps to HF Ramps	19,244	19,633	179	9,223	10,021	9,732	9,901	75	104
Henry Ford Ramps	5,588	2,396	6	2,800	2,788	1,162	1,234	6	0
Henry Ford n/o Ramps to Alameda	696	2,764	8	198	498	1,585	1,179	2	6
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	13,659	17,236	173	6,427	7,232	8,570	8,666	69	104
SR-103 Anaheim to PCH	20,236	18,871	369	11,356	8,880	9,399	9,472	207	162
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	25,717	15,755	602	14,954	10,763	7,507	8,248	394	208
SR-103 Ramps south of Sepulveda/Willow	13,372	4,196	251	6,477	6,895	2,064	2,132	124	127
SR-103, Realignment to End (223rd/Wardlow)	12,346	11,557	353	8,478	3,868	5,443	6,114	270	83
E and W Harry Bridges, Figueroa to start Alameda	11,597	3,157	211	5,515	6,082	1,704	1,453	79	132
Alameda beginning (E Harry Bridges) to Anaheim	22,205	5,779	598	11,061	11,144	3,095	2,684	290	308
Alameda Anaheim to Henry Ford	11,505	3,942	607	4,839	6,666	1,974	1,968	262	345
Alameda, Henry Ford to PCH	12,198	6,707	615	5,035	7,163	3,561	3,146	264	351
Alameda PCH to 405	38,621	5,924	1,654	17,907	20,714	3,230	2,694	722	932
Alameda 405 to del Amo	34,954	7,614	1,453	18,197	16,757	3,703	3,911	726	727
Alameda, del Amo to South Santa Fe Avenue	21,300	4,672	886	11,830	9,470	2,587	2,085	485	401
Alameda, South Santa Fe Avenue to SR-91	17,930	4,108	748	7,627	10,303	1,872	2,236	319	429
I-110, "C" Street Interchange to Anaheim	115,091	12,874	2,681	55,937	59,154	7,260	5,614	1,246	1,435
I-110, Anaheim to PCH	118,882	13,227	3,104	57,677	61,205	7,483	5,744	1,435	1,669
1-110, PCH to Sepulveda	151,893	13,841	4,652	74,739	77,154	7,795	6,046	2,255	2,397
I-110, Sepulveda to Carson	174,567	12,884	6,334	89,228	85,339	7,226	5,658	3,253	3,081
I-110, Carson to Del Amo	200,611	12,416	7,288	97,511	103,100	6,999	5,417	3,584	3,704
I-110, Del Amo to 405	188,206	10,251	7,276	78,104	110,102	4,990	5,261	3,206	4,070
I-110, 405 to SR-91	238,771	9,982	11,444	153,472	85,299	5,850	4,132	8,030	3,414
I-710, Anaheim to PCH	112,326	41,356	3,767	51,918	60,408	21,509	19,847	1,732	2,035
I-710, PCH to Willow	122,653	43,159	4,309	58,774	63,879	22,751	20,408	2,142	2,167
I-710, Willow to 405	126,607	42,926	4,375	58,658	67,949	22,523	20,403	2,123	2,252
I-710, 405 to Del Amo	168,254	42,186	6,634	87,613	80,641	21,916	20,270	3,442	3,192
I-710, Del Amo to Long Beach Blvd Interchange	169,110	41,734	7,322	87,712	81,398	21,553	20,181	3,725	3,597
I-710, Long Beach Boulevard to SR-91	177,538	41,470	7,538	84,854	92,684	21,318	20,152	3,633	3,905
PCH, I-110 to Alameda	33,666	1,853	1,116	16,367	17,299	1,076	777	510	606
PCH, Alameda to SR-103	17,366	353	372	8,090	9,276	301	52	183	189
PCH, SR-103 to I-710	17,480	4,510	342	7,842	9,638	2,723	1,787	155	187
Sepulveda, I-110 to Avalon	19,113	290	618	9,548	9,565	221	69	294	324
Sepulveda, Avalon to Alameda	12,455	165	397	6,075	6,380	137	28	188	209
Sepulveda, Alameda to ICTF	10,067	1,155	252	5,165	4,902	641	514	131	121
Sepulveda, ICTF to SR-103	6,757	4,196	182	3,571	3,186	2,132	2,064	100	82
Del Amo, I-110 to Wilmington	12,308	110	467	6,533	5,775	82	28	272	195
Del Amo, Wilminton to Alameda	32,393	1,518	1,707	15,993	16,400	820	698	843	864
Del Amo, Alameda to I-710	27,842	839	1,326	13,557	14,285	268	571	616	710
223rd Street, I-110 to Avalon	19,709	90	528	9,721	9,988	52	38	281	247
223rd Street, Avalon to Wilmington	14,290	105	494	8,639	5,651	87	18	341	153
223rd Street, Wilmington to Alameda	14,504	1,222	789	5,400	9,104	624	598	318	471
W Wardlow from Alameda to I-710	10,662	1,317	505	5,216	5,446	1,132	185	287	218

SR-47 Traffic Data
2030 Alternative 2 AADT Counts

Scenario / Road Segments	ADT			ADT					
				Autos		Port Trucks		SCAG Trucks	
	Autos	Port	SCAG	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
2030 Alternative 2									
SR-47 Mainline, New Dock Ramps to HF Ramps	23,431	35,337	172	11,651	11,780	18,140	17,197	100	72
Henry Ford Ramps	7,460	5,135	11	3,685	3,775	3,223	1,912	10	1
Henry Ford n/o Ramps to Alameda	9,126	9,277	267	4,216	4,910	5,602	3,675	256	11
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	15,964	30,197	162	7,961	8,003	14,916	15,281	91	71
SR-103 Anaheim to PCH	24,126	33,721	436	13,711	10,415	16,748	16,973	272	164
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	30,198	29,585	757	16,637	13,561	14,467	15,118	485	272
SR-103 Ramps south of Sepulveda/Willow	17,931	9,069	362	8,883	9,048	4,583	4,486	189	173
SR-103, Realignment to End (223rd/Wardlow)	12,267	20,517	397	7,752	4,515	9,885	10,632	297	100
E and W Harry Bridges, Figueroa to start Alameda	14,945	5,918	263	7,449	7,496	2,828	3,090	95	168
Alameda beginning (E Harry Bridges) to Anaheim	24,731	6,942	625	12,023	12,708	3,601	3,341	282	343
Alameda Anaheim to Henry Ford	12,339	4,259	638	4,894	7,445	1,948	2,311	256	382
Alameda, Henry Ford to PCH	13,285	10,747	650	4,993	8,292	5,602	5,145	256	394
Alameda PCH to 405	43,029	8,822	1,913	18,862	24,167	5,032	3,790	836	1,077
Alameda 405 to del Amo	41,356	13,654	1,778	21,267	20,089	7,384	6,270	895	883
Alameda, del Amo to South Santa Fe Avenue	29,716	9,415	1,309	16,141	13,575	5,126	4,289	684	625
Alameda, South Santa Fe Avenue to SR-91	23,624	7,280	1,038	12,928	10,696	3,985	3,295	539	499
I-110, "C" Street Interchange to Anaheim	132,764	17,532	3,293	64,037	68,727	9,857	7,675	1,497	1,796
I-110, Anaheim to PCH	135,680	17,838	3,772	65,802	69,878	10,030	7,808	1,720	2,052
1-110, PCH to Sepulveda	167,211	18,532	5,345	81,568	85,643	10,351	8,181	2,536	2,809
I-110, Sepulveda to Carson	208,207	17,174	8,019	105,206	103,001	9,607	7,567	4,078	3,941
I-110, Carson to Del Amo	216,230	16,415	8,367	105,206	111,024	9,247	7,168	4,078	4,289
I-110, Del Amo to 405	229,039	15,889	9,547	109,917	119,122	8,968	6,921	4,776	4,771
I-110, 405 to SR-91	258,623	13,577	13,705	165,060	93,563	8,131	5,446	9,680	4,025
I-710, Anaheim to PCH	115,945	64,694	4,240	53,839	62,106	33,869	30,825	2,017	2,223
I-710, PCH to Willow	121,538	64,713	4,612	57,786	63,752	33,195	31,518	2,244	2,368
I-710, Willow to 405	126,938	64,376	4,723	57,570	69,368	32,868	31,508	2,229	2,494
I-710, 405 to Del Amo	170,564	64,701	7,158	88,574	81,990	32,473	32,228	3,715	3,443
I-710, Del Amo to Long Beach Blvd Interchange	170,006	64,698	7,741	87,331	82,675	32,919	31,779	3,859	3,882
I-710, Long Beach Boulevard to SR-91	216,007	64,411	11,460	105,342	110,665	32,512	31,899	5,413	6,047
PCH, I-110 to Alameda	40,452	3,071	1,374	19,633	20,819	2,029	1,042	661	713
PCH, Alameda to SR-103	23,473	747	570	10,700	12,773	532	215	250	320
PCH, SR-103 to I-710	28,355	7,366	968	14,684	13,671	4,537	2,829	538	430
Sepulveda, I-110 to Avalon	26,102	535	828	12,865	13,237	472	63	407	421
Sepulveda, Avalon to Alameda	26,227	516	1,013	12,790	13,437	469	47	486	527
Sepulveda, Alameda to ICTF	11,557	1,800	326	6,045	5,512	870	930	173	153
Sepulveda, ICTF to SR-103	7,711	9,069	253	4,244	3,467	4,486	4,583	138	115
Del Amo, I-110 to Wilmington	24,862	340	891	11,777	13,085	177	163	456	435
Del Amo, Wilminton to Alameda	35,888	1,906	1,962	16,910	18,978	1,069	837	896	1,066
Del Amo, Alameda to I-710	46,310	2,323	2,050	21,379	24,931	1,480	843	911	1,139
223rd Street, I-110 to Avalon	24,278	205	738	11,874	12,404	86	119	384	354
223rd Street, Avalon to Wilmington	17,354	185	640	9,972	7,382	128	57	349	291
223rd Street, Wilmington to Alameda	19,665	2,443	1,085	7,845	11,820	1,428	1,015	378	707
W Wardlow from Alameda to I-710	35,615	5,534	1,409	15,912	19,703	4,129	1,405	843	566

SR-47 Traffic Data
Existing 2003 Peak Hour Counts

Scenario / Road Segments	NB+SB AM Peak Hours (08-09)				NB+SB Midday Peak Hours (14-15)				NB+SB PM Peak Hours (16-17)			
	All Autos	Port Trucks	SCAG Trucks	All Trucks	All Autos	Port Trucks	SCAG Trucks	All Trucks	All Autos	Port Trucks	SCAG Trucks	All Trucks
Existing 2003												
SR-47 Mainline, New Dock Ramps to HF Ramps	782	917	9	926	573	1,622	51	1,673	849	1,005	65	1,070
Henry Ford Ramps	438	300	0	300	216	509	2	511	321	344	1	345
Henry Ford n/o Ramps to Alameda	882	324	21	345	490	533	16	549	1,041	362	20	382
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	571	1,047	47	1,094	1,368	4,432	41	4,473	872	1,281	105	1,386
SR-103 Anaheim to PCH	580	1,118	57	1,175	1,288	4,708	50	4,758	876	1,414	121	1,535
SR-103 PCH to Sepulveda/Willow	515	742	49	791	786	2,940	66	3,006	640	1,087	109	1,196
E and W Harry Bridges, Figueroa to start Alameda	1,198	209	8	217	1,148	296	28	324	1,545	180	14	194
Alameda beginning (E Harry Bridges) to Anaheim	2,355	517	75	592	6,344	1,639	220	1,859	5,127	608	103	711
Alameda Anaheim to Henry Ford	863	152	15	167	717	189	38	227	1,358	125	27	152
Alameda Henry Ford to PCH	3,223	833	101	934	5,363	3,214	325	3,539	5,143	1,146	159	1,305
Alameda PCH to 405	9,661	686	410	1,096	14,691	2,668	1,160	3,828	13,845	915	621	1,536
Alameda 405 to del Amo	8,692	359	265	624	12,853	1,402	675	2,077	13,504	597	440	1,037
Alameda, del Amo to South Santa Fe Avenue	1,352	146	52	198	1,466	236	94	330	1,677	135	59	194
Alameda, South Santa Fe Avenue to SR-91	3,011	65	93	158	3,093	107	203	310	3,973	70	172	242
I-110, "C" Street Interchange to Anaheim	8,985	902	114	1,016	9,024	1,269	339	1,608	11,827	824	251	1,075
I-110, Anaheim to PCH	9,610	899	133	1,032	9,769	1,265	368	1,633	12,526	821	290	1,111
1-110, PCH to Sepulveda	11,399	882	163	1,045	11,346	1,246	460	1,706	14,285	806	351	1,157
I-110, Sepulveda to Carson	13,089	832	203	1,035	12,943	1,158	597	1,755	15,755	735	438	1,173
I-110, Carson to Del Amo	14,799	793	237	1,030	14,501	1,075	692	1,767	17,666	688	504	1,192
I-110, Del Amo to 405	15,961	764	268	1,032	15,363	1,038	791	1,829	18,861	668	575	1,243
I-110, 405 to SR-91	53,582	1,314	1,859	3,173	85,407	4,440	5,047	9,487	76,380	1,446	2,770	4,216
I-710, Anaheim to PCH	7,502	1,781	129	1,910	6,701	2,383	355	2,738	9,216	1,740	263	2,003
I-710, PCH to Willow	8,642	1,936	162	2,098	7,732	2,681	436	3,117	10,612	1,874	320	2,194
I-710, Willow to 405	9,521	1,934	177	2,111	8,381	2,677	471	3,148	11,584	1,870	371	2,241
I-710, 405 to Del Amo	13,263	1,705	283	1,988	12,110	2,369	739	3,108	16,324	1,630	623	2,253
I-710, Del Amo to Long Beach Blvd Interchange	13,100	1,640	303	1,943	11,761	2,277	773	3,050	15,570	1,554	633	2,187
I-710, Long Beach Boulevard to SR-91	13,939	1,601	324	1,925	12,565	2,218	809	3,027	16,576	1,526	684	2,210
PCH, I110 to Alameda	9,309	180	220	400	11,394	803	506	1,309	13,337	297	334	631
PCH, Alameda to SR-103	4,992	57	104	161	5,055	173	218	391	7,658	98	166	264
PCH, SR-103 to I-710	7,350	820	236	1,056	8,917	3,534	452	3,986	10,551	1,002	350	1,352
Sepulveda, I-110 to Avalon	1,751	9	27	36	1,998	35	88	123	2,503	23	60	83
Sepulveda, Avalon to Alameda	1,725	25	28	53	1,806	58	101	159	2,504	54	70	124
Sepulveda, Alameda to ICTF	1,871	98	25	123	1,878	184	74	258	2,788	114	58	172
Sepulveda, ICTF to SR-103	1,775	396	26	422	1,771	620	74	694	2,471	410	54	464
Del Amo, I-110 to Wilmington**	0	0	0	0	0	0	0	0	0	0	0	0
Del Amo, Wilmington to Alameda	1,570	9	51	60	1,902	4	165	169	2,634	6	106	112
Del Amo, Alameda to I-710	3,968	54	93	147	4,643	66	308	374	5,913	51	209	260
223rd Street, I-110 to Avalon	2,105	9	24	33	1,933	13	89	102	2,558	14	71	85
223rd Street, Avalon to Wilmington	1,665	9	22	31	1,712	22	91	113	2,160	9	67	76
223rd Street, Wilmington to Alameda	1,405	35	23	58	1,532	55	98	153	2,275	27	78	105
W Wardlow from Alameda to I-710	1,717	10	34	44	2,051	12	95	107	2,901	6	84	90

****DEL AMO LINK EAST OF 110, BETWEEN MAIN AND WILMINGTON, DID NOT EXIST IN 2003**

SR-47 Traffic Data
Existing 2003 Peak Hour Counts

Scenario / Road Segments	Counts AM Peak Hours						Counts Midday Peak Hours						Counts PM Peak Hours					
	Autos		Port Trucks		SCAG Trucks		Autos		Port Trucks		SCAG Trucks		Autos		Port Trucks		SCAG Trucks	
	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
Existing 2003																		
SR-47 Mainline, New Dock Ramps to HF Ramps	273	509	395	522	3	6	351	222	854	768	17	34	582	267	578	427	28	37
Henry Ford Ramps	153	285	163	137	0	0	135	81	334	175	2	0	224	97	243	101	1	0
Henry Ford n/o Ramps to Alameda	376	506	176	148	10	11	242	248	311	222	6	10	546	495	243	119	9	11
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	183	388	454	593	23	24	617	751	2,076	2,356	15	26	490	382	696	585	54	51
SR-103 Anaheim to PCH	202	378	543	575	34	23	624	664	2,523	2,185	31	19	507	369	920	494	72	49
SR-103 PCH to Sepulveda/Willow	92	423	231	511	18	31	340	446	1,293	1,647	24	42	338	302	536	551	58	51
E and W Harry Bridges, Figueroa to start Alameda	630	568	73	136	5	3	614	534	127	169	15	13	719	826	88	92	11	3
Alameda beginning (E Harry Bridges) to Anaheim	2,034	321	196	321	39	36	3,350	2,994	646	993	109	111	2,267	2,860	240	368	53	50
Alameda Anaheim to Henry Ford	388	475	86	66	10	5	287	430	79	110	16	22	550	808	60	65	17	10
Alameda Henry Ford to PCH	2,041	1,182	389	444	55	46	2,788	2,575	1,637	1,577	172	153	2,149	2,994	638	508	75	84
Alameda PCH to 405	4,683	4,978	334	352	200	210	7,570	7,121	1,396	1,272	608	552	6,600	7,245	518	397	295	326
Alameda 405 to del Amo	4,957	3,735	217	142	142	123	6,749	6,104	774	628	365	310	6,504	7,000	399	198	221	219
Alameda, del Amo to South Santa Fe Avenue	790	562	60	86	24	28	808	658	108	128	53	41	844	833	88	47	30	29
Alameda, South Santa Fe Avenue to SR-91	1,173	1,838	46	19	44	49	1,398	1,695	59	48	95	108	2,369	1,604	54	16	81	91
I-110, "C" Street Interchange to Anaheim	5,451	3,534	394	508	65	49	4,841	4,183	652	617	174	165	5,228	6,599	454	370	119	132
I-110, Anaheim to PCH	5,758	3,852	392	507	72	61	5,094	4,675	650	615	168	200	5,555	6,971	453	368	136	154
1-110, PCH to Sepulveda	6,689	4,710	375	507	82	81	5,946	5,400	630	616	226	234	6,324	7,961	448	358	170	181
I-110, Sepulveda to Carson	7,915	5,174	348	484	103	100	7,000	5,943	568	590	318	279	7,392	8,363	402	333	234	204
I-110, Carson to Del Amo	8,352	6,447	336	457	107	130	7,429	7,072	540	535	341	351	7,900	9,766	383	305	257	247
I-110, Del Amo to 405	8,837	7,124	327	437	118	150	7,690	7,673	519	519	387	404	8,298	10,563	365	303	288	287
I-110, 405 to SR-91	36,660	16,922	555	759	1,286	573	56,763	28,644	2,259	2,181	3,558	1,489	46,609	29,771	860	586	1,926	844
I-710, Anaheim to PCH	3,540	3,962	741	1,040	64	65	3,059	3,642	1,128	1,255	157	198	4,182	5,034	1,019	721	107	156
I-710, PCH to Willow	4,151	4,491	888	1,048	87	75	3,658	4,074	1,379	1,302	202	234	4,925	5,687	1,145	729	134	186
I-710, Willow to 405	4,635	4,886	887	1,047	93	84	3,942	4,439	1,376	1,301	212	259	5,296	6,288	1,142	728	140	231
I-710, 405 to Del Amo	6,755	6,508	786	919	156	127	6,417	5,693	1,227	1,142	356	383	8,604	7,720	975	655	271	352
I-710, Del Amo to Long Beach Blvd Interchange	6,494	6,606	758	882	159	144	6,173	5,588	1,183	1,094	378	395	8,223	7,347	936	618	269	364
I-710, Long Beach Boulevard to SR-91	6,514	7,425	735	866	152	172	6,072	6,493	1,147	1,071	363	446	8,133	8,443	921	605	274	410
PCH, I110 to Alameda	4,359	4,950	108	72	104	116	5,475	5,919	441	362	234	272	6,200	7,137	145	152	160	174
PCH, Alameda to SR-103	2,320	2,672	29	28	42	62	2,217	2,838	93	80	80	138	3,311	4,347	50	48	78	88
PCH, SR-103 to I-710	3,624	3,726	534	286	119	117	4,666	4,251	2,120	1,414	224	228	5,470	5,081	722	280	190	160
Sepulveda, I-110 to Avalon	897	854	3	6	11	16	985	1,013	26	9	42	46	1,193	1,310	16	7	22	38
Sepulveda, Avalon to Alameda	928	797	9	16	11	17	903	903	25	33	49	52	1,106	1,398	20	34	33	37
Sepulveda, Alameda to ICTF	861	1,010	40	58	9	16	898	980	87	97	38	36	1,457	1,331	52	62	26	32
Sepulveda, ICTF to SR-103	958	817	262	134	10	16	924	847	340	280	37	37	1,233	1,238	196	214	23	31
Del Amo, I-110 to Wilmington**																		
Del Amo, Wilmington to Alameda	497	1,073	3	6	18	33	904	998	2	2	74	91	1,485	1,149	1	5	44	62
Del Amo, Alameda to I-710	1,276	2,692	34	20	37	56	2,150	2,493	42	24	145	163	3,348	2,565	31	20	93	116
223rd Street, I-110 to Avalon	1,004	1,101	3	6	13	11	961	972	2	11	41	48	1,287	1,271	0	14	38	33
223rd Street, Avalon to Wilmington	912	753	5	4	11	11	891	821	14	8	44	47	1,108	1,052	7	2	38	29
223rd Street, Wilmington to Alameda	531	874	29	6	7	16	687	845	33	22	37	61	1,120	1,155	17	10	39	39
W Wardlow from Alameda to I-710	801	916	0	10	18	16	1,074	977	3	9	46	49	1,531	1,370	2	4	47	37

****DEL AMO LINK EAST OF 110, BETWEEN MAIN AND WIL**

SR-47 Traffic Data
2015 No-Build Peak Hour Counts

Scenario / Road Segments	NB+SB AM Peak Hours (08-09)				NB+SB Midday Peak Hours (14-15)				NB+SB PM Peak Hours (16-17)			
	All Autos	Port Trucks	SCAG Trucks	All Trucks	All Autos	Port Trucks	SCAG Trucks	All Trucks	All Autos	Port Trucks	SCAG Trucks	All Trucks
Baseline 2015												
SR-47 Mainline, New Dock Ramps to HF Ramps	1,737	1,191	2	1,193	1,233	1,825	9	1,834	2,261	994	13	1,007
Henry Ford Ramps	736	574	0	574	506	846	0	846	966	475	0	475
Henry Ford n/o Ramps to Alameda	909	644	0	644	568	878	0	878	1,135	485	0	485
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1,001	453	2	455	725	978	9	987	1,293	520	13	533
SR-103 Anaheim to PCH	1,123	610	6	616	1,006	977	20	997	1,597	620	22	642
SR-103 PCH to Sepulveda/Willow	1,298	308	13	321	1,105	483	27	510	1,684	302	26	328
E and W Harry Bridges, Figueroa to start Alameda	1,335	301	11	312	1,118	418	18	436	1,398	285	9	294
Alameda beginning (E Harry Bridges) to Anaheim	1,836	466	22	488	1,549	525	47	572	2,393	320	29	349
Alameda Anaheim to Henry Ford	921	344	26	370	686	337	51	388	1,324	227	38	265
Alameda Henry Ford to PCH	996	924	25	949	757	1,139	52	1,191	1,537	675	38	713
Alameda PCH to 405	4,001	904	116	1,020	3,353	1,243	185	1,428	4,499	722	135	857
Alameda 405 to del Amo	3,691	592	108	700	3,537	849	227	1,076	4,162	515	138	653
Alameda, del Amo to South Santa Fe Avenue	2,699	372	95	467	2,497	594	178	772	3,558	363	132	495
Alameda, South Santa Fe Avenue to SR-91	1,897	298	62	360	1,944	438	138	576	2,532	263	99	362
I-110, "C" Street Interchange to Anaheim	8,946	1,175	150	1,325	8,959	1,546	290	1,836	10,874	894	177	1,071
I-110, Anaheim to PCH	9,739	1,196	189	1,385	8,946	1,553	330	1,883	10,985	902	219	1,121
1-110, PCH to Sepulveda	11,518	1,216	246	1,462	10,601	1,551	418	1,969	12,661	901	284	1,185
I-110, Sepulveda to Carson	12,787	1,152	316	1,468	11,709	1,447	528	1,975	13,861	842	353	1,195
I-110, Carson to Del Amo	14,629	1,108	368	1,476	13,367	1,379	607	1,986	15,736	798	421	1,219
I-110, Del Amo to 405	15,640	1,072	469	1,541	14,169	1,337	717	2,054	16,756	772	495	1,267
I-110, 405 to SR-91	17,882	896	617	1,513	16,352	1,126	1,096	2,222	19,272	689	698	1,387
I-710, Anaheim to PCH	7,111	2,864	136	3,000	6,548	3,289	241	3,530	8,775	2,256	185	2,441
I-710, PCH to Willow	7,836	3,060	178	3,238	7,120	3,525	287	3,812	9,507	2,407	211	2,618
I-710, Willow to 405	8,319	3,045	189	3,234	7,347	3,508	296	3,804	10,013	2,395	223	2,618
I-710, 405 to Del Amo	11,773	2,836	306	3,142	10,420	3,196	487	3,683	13,205	2,220	357	2,577
I-710, Del Amo to Long Beach Blvd Interchange	11,627	2,766	332	3,098	10,370	3,109	530	3,639	13,116	2,189	381	2,570
I-710, Long Beach Boulevard to SR-91	15,065	2,749	536	3,285	13,751	3,083	775	3,858	16,466	2,163	561	2,724
PCH, I110 to Alameda	3,664	132	77	209	3,153	172	140	312	4,089	109	106	215
PCH, Alameda to SR-103	2,128	92	33	125	1,812	151	69	220	2,387	51	48	99
PCH, SR-103 to I-710	2,278	373	54	427	1,310	661	52	713	2,263	378	48	426
Sepulveda, I-110 to Avalon	1,941	19	36	55	1,809	50	75	125	1,989	32	47	79
Sepulveda, Avalon to Alameda	1,991	32	52	84	1,842	89	89	178	1,786	35	52	87
Sepulveda, Alameda to ICTF	1,126	152	19	171	835	273	34	307	1,148	153	26	179
Sepulveda, ICTF to SR-103	799	308	15	323	621	483	29	512	900	302	24	326
Del Amo, I-110 to Wilmington	1,815	19	29	48	1,569	29	65	94	1,927	21	34	55
Del Amo, Wilminton to Alameda	2,581	106	87	193	2,667	108	168	276	2,901	62	104	166
Del Amo, Alameda to I-710	3,394	83	96	179	3,470	84	173	257	4,023	68	127	195
223rd Street, I-110 to Avalon	2,027	4	42	46	1,787	7	72	79	2,164	5	55	60
223rd Street, Avalon to Wilmington	1,513	4	39	43	1,402	4	69	73	1,636	1	44	45
223rd Street, Wilmington to Alameda	1,750	49	76	125	1,962	92	153	245	2,464	40	97	137
W Wardlow from Alameda to I-710	2,602	11	52	63	2,504	26	94	120	3,054	3	73	76

SR-47 Traffic Data
2015 No-Build Peak Hour Counts

Scenario / Road Segments	Counts AM Peak Hours						Counts Midday Peak Hours						Counts PM Peak Hours					
	Autos		Port Trucks		SCAG Trucks		Autos		Port Trucks		SCAG Trucks		Autos		Port Trucks		SCAG Trucks	
	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
Baseline 2015																		
SR-47 Mainline, New Dock Ramps to HF Ramps	826	911	415	776	0	2	859	374	969	856	7	2	1,583	678	702	292	10	3
Henry Ford Ramps	349	387	222	352	0	0	320	186	445	401	0	0	616	350	286	189	0	0
Henry Ford n/o Ramps to Alameda	441	468	248	396	0	0	345	223	451	427	0	0	719	416	297	188	0	0
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	478	523	146	307	0	2	539	186	524	454	7	2	965	328	416	104	10	3
SR-103 Anaheim to PCH	638	485	241	369	5	1	739	267	615	362	16	4	1,244	353	502	118	18	4
SR-103 PCH to Sepulveda/Willow	600	698	125	183	4	9	717	388	279	204	14	13	1,174	510	210	92	18	8
E and W Harry Bridges, Figueroa to start Alameda	681	654	140	161	8	3	546	572	211	207	9	9	601	797	155	130	3	6
Alameda beginning (E Harry Bridges) to Anaheim	968	868	231	235	11	11	696	853	252	273	19	28	982	1,411	166	154	10	19
Alameda Anaheim to Henry Ford	481	440	147	197	13	13	261	425	134	203	19	32	428	896	114	113	11	27
Alameda Henry Ford to PCH	488	508	376	548	12	13	309	448	554	585	20	32	571	966	392	283	11	27
Alameda PCH to 405	1,943	2,058	366	538	47	69	1,579	1,774	646	597	74	111	1,938	2,561	448	274	56	79
Alameda 405 to del Amo	1,905	1,786	210	382	52	56	1,948	1,589	456	393	127	100	2,275	1,887	341	174	75	63
Alameda, del Amo to South Santa Fe Avenue	1,052	1,647	152	220	41	54	1,403	1,094	366	228	106	72	2,295	1,263	244	119	80	52
Alameda, South Santa Fe Avenue to SR-91	971	926	139	159	38	24	1,158	786	277	161	90	48	1,532	1,000	176	87	60	39
I-110, "C" Street Interchange to Anaheim	4,998	3,948	511	664	68	82	4,556	4,403	853	693	140	150	4,712	6,162	569	325	89	88
I-110, Anaheim to PCH	5,561	4,178	528	668	82	107	4,416	4,530	861	692	157	173	4,711	6,274	581	321	109	110
1-110, PCH to Sepulveda	6,671	4,847	542	674	107	139	5,400	5,201	858	693	212	206	5,628	7,033	581	320	152	132
I-110, Sepulveda to Carson	7,532	5,255	513	639	148	168	6,232	5,477	785	662	297	231	6,566	7,295	534	308	198	155
I-110, Carson to Del Amo	7,973	6,656	496	612	154	214	6,704	6,663	754	625	321	286	7,064	8,672	508	290	212	209
I-110, Del Amo to 405	8,289	7,351	481	591	225	244	6,973	7,196	732	605	392	325	7,503	9,253	490	282	258	237
I-110, 405 to SR-91	11,690	6,192	400	496	395	222	10,530	5,822	638	488	811	285	11,750	7,522	454	235	486	212
I-710, Anaheim to PCH	3,451	3,660	1,237	1,627	65	71	3,015	3,533	1,709	1,580	110	131	4,023	4,752	1,407	849	70	115
I-710, PCH to Willow	3,995	3,841	1,318	1,742	87	91	3,396	3,724	1,871	1,654	142	145	4,480	5,027	1,557	850	91	120
I-710, Willow to 405	4,015	4,304	1,304	1,741	86	103	3,373	3,974	1,854	1,654	141	155	4,499	5,514	1,545	850	90	133
I-710, 405 to Del Amo	5,791	5,982	1,188	1,648	159	147	5,340	5,080	1,651	1,545	256	231	6,865	6,340	1,408	812	159	198
I-710, Del Amo to Long Beach Blvd Interchange	5,653	5,974	1,175	1,591	170	162	5,273	5,097	1,614	1,495	268	262	6,788	6,328	1,376	813	162	219
I-710, Long Beach Boulevard to SR-91	6,890	8,175	1,154	1,595	245	291	6,508	7,243	1,581	1,502	363	412	8,312	8,154	1,348	815	254	307
PCH, I110 to Alameda	1,836	1,828	78	54	30	47	1,524	1,629	94	78	58	82	1,869	2,220	58	51	53	53
PCH, Alameda to SR-103	929	1,199	65	27	11	22	754	1,058	80	71	25	44	1,002	1,385	28	23	20	28
PCH, SR-103 to I-710	1,198	1,080	144	229	25	29	514	796	426	235	19	33	983	1,280	325	53	22	26
Sepulveda, I-110 to Avalon	924	1,017	11	8	17	19	903	906	46	4	37	38	997	992	28	4	21	26
Sepulveda, Avalon to Alameda	1,081	910	19	13	22	30	898	944	68	21	41	48	842	944	24	11	24	28
Sepulveda, Alameda to ICTF	488	638	78	74	6	13	466	369	104	169	19	15	640	508	38	115	15	11
Sepulveda, ICTF to SR-103	416	383	183	125	5	10	369	252	204	279	17	12	498	402	92	210	15	9
Del Amo, I-110 to Wilmington	1,013	802	9	10	14	15	718	851	14	15	31	34	749	1,178	13	8	15	19
Del Amo, Wilminton to Alameda	827	1,754	78	28	43	44	1,194	1,473	64	44	77	91	1,669	1,232	17	45	45	59
Del Amo, Alameda to I-710	1,158	2,236	44	39	42	54	1,566	1,904	37	47	70	103	2,175	1,848	24	44	46	81
223rd Street, I-110 to Avalon	1,000	1,027	1	3	22	20	844	943	2	5	33	39	1,083	1,081	4	1	29	26
223rd Street, Avalon to Wilmington	829	684	4	0	19	20	683	719	4	0	34	35	830	806	1	0	23	21
223rd Street, Wilmington to Alameda	507	1,243	14	35	24	52	739	1,223	40	52	66	87	1,198	1,266	22	18	42	55
W Wardlow from Alameda to I-710	1,084	1,518	1	10	25	27	1,342	1,162	22	4	47	47	1,520	1,534	1	2	33	40

SR-47 Traffic Data
2030 No-Build Peak Hour Counts

Scenario / Road Segments	NB+SB AM Peak Hours (08-09)				NB+SB Midday Peak Hours (14-15)				NB+SB PM Peak Hours (16-17)			
	All Autos	Port Trucks	SCAG Trucks	All Trucks	All Autos	Port Trucks	SCAG Trucks	All Trucks	All Autos	Port Trucks	SCAG Trucks	All Trucks
Baseline 2030												
SR-47 Mainline, New Dock Ramps to HF Ramps	2,303	2,441	2	2,443	1,307	3,030	4	3,034	2,764	1,793	4	1,797
Henry Ford Ramps	902	775	0	775	563	1,132	0	1,132	1,147	697	0	697
Henry Ford n/o Ramps to Alameda	1,183	830	11	841	711	1,289	17	1,306	1,536	715	9	724
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1,401	1,667	2	1,669	744	1,898	4	1,902	1,617	1,095	4	1,099
SR-103 Anaheim to PCH	1,789	1,602	7	1,609	1,425	1,984	29	2,013	2,303	1,171	17	1,188
SR-103 PCH to Sepulveda/Willow	1,773	650	10	660	1,317	945	30	975	1,991	634	16	650
E and W Harry Bridges, Figueroa to start Alameda	1,626	326	11	337	1,408	561	35	596	2,419	307	23	330
Alameda beginning (E Harry Bridges) to Anaheim	2,103	522	18	540	1,714	618	52	670	2,679	339	28	367
Alameda Anaheim to Henry Ford	1,238	382	25	407	762	382	51	433	1,716	235	37	272
Alameda Henry Ford to PCH	989	1,104	24	1,128	779	1,427	50	1,477	1,680	794	39	833
Alameda PCH to 405	4,567	1,259	135	1,394	3,861	1,638	225	1,863	5,061	953	155	1,108
Alameda 405 to del Amo	3,985	926	145	1,071	3,776	1,330	235	1,565	4,748	692	159	851
Alameda, del Amo to South Santa Fe Avenue	3,270	634	134	768	3,204	1,099	223	1,322	4,099	537	143	680
Alameda, South Santa Fe Avenue to SR-91	2,351	550	96	646	2,282	775	153	928	2,736	400	88	488
I-110, "C" Street Interchange to Anaheim	10,660	1,636	177	1,813	10,138	1,906	326	2,232	12,472	1,079	206	1,285
I-110, Anaheim to PCH	10,478	1,654	212	1,866	9,835	1,883	358	2,241	12,023	1,086	238	1,324
1-110, PCH to Sepulveda	11,467	1,667	264	1,931	11,439	1,915	456	2,371	13,691	1,087	307	1,394
I-110, Sepulveda to Carson	13,126	1,554	365	1,919	13,244	1,787	644	2,431	15,596	1,001	425	1,426
I-110, Carson to Del Amo	15,014	1,481	392	1,873	14,177	1,694	680	2,374	16,525	951	445	1,396
I-110, Del Amo to 405	16,173	1,429	505	1,934	15,163	1,625	851	2,476	17,586	919	523	1,442
I-110, 405 to SR-91	18,636	1,248	667	1,915	17,426	1,391	1,316	2,707	20,150	865	729	1,594
I-710, Anaheim to PCH	6,353	4,506	133	4,639	6,090	4,676	237	4,913	8,685	3,338	185	3,523
I-710, PCH to Willow	6,600	4,674	151	4,825	6,311	4,854	257	5,111	8,909	3,432	203	3,635
I-710, Willow to 405	7,262	4,682	161	4,843	6,702	4,832	270	5,102	11,937	3,423	288	3,711
I-710, 405 to Del Amo	10,928	4,258	259	4,517	10,068	4,402	462	4,864	12,881	3,182	352	3,534
I-710, Del Amo to Long Beach Blvd Interchange	10,598	4,138	284	4,422	9,904	4,286	489	4,775	12,683	3,105	369	3,474
I-710, Long Beach Boulevard to SR-91	13,383	4,162	525	4,687	13,706	4,230	834	5,064	16,820	3,054	605	3,659
PCH, I110 to Alameda	4,322	194	90	284	3,776	238	170	408	4,927	123	112	235
PCH, Alameda to SR-103	2,307	328	35	363	2,142	373	84	457	2,842	123	47	170
PCH, SR-103 to I-710	1,923	869	47	916	1,378	958	69	1,027	2,245	578	50	628
Sepulveda, I-110 to Avalon	2,069	51	41	92	1,935	69	98	167	2,213	54	52	106
Sepulveda, Avalon to Alameda	2,176	85	58	143	2,013	160	112	272	2,375	85	58	143
Sepulveda, Alameda to ICTF	1,084	247	17	264	593	486	27	513	1,086	270	26	296
Sepulveda, ICTF to SR-103	771	650	13	663	388	945	22	967	822	634	20	654
Del Amo, I-110 to Wilmington	2,341	47	53	100	2,215	70	117	187	2,480	30	64	94
Del Amo, Wilminton to Alameda	2,614	140	90	230	2,939	119	188	307	3,223	76	110	186
Del Amo, Alameda to I-710	3,947	111	110	221	3,904	110	198	308	2,645	83	113	196
223rd Street, I-110 to Avalon	2,305	13	55	68	2,273	17	94	111	2,423	6	58	64
223rd Street, Avalon to Wilmington	1,880	11	53	64	1,966	11	92	103	2,144	4	52	56
223rd Street, Wilmington to Alameda	2,039	136	85	221	2,279	90	178	268	2,590	79	103	182
W Wardlow from Alameda to I-710	3,207	87	105	192	3,246	140	197	337	3,727	51	111	162

SR-47 Traffic Data
2030 No-Build Peak Hour Counts

Scenario / Road Segments	Counts AM Peak Hours						Counts Midday Peak Hours						Counts PM Peak Hours					
	Autos		Port Trucks		SCAG Trucks		Autos		Port Trucks		SCAG Trucks		Autos		Port Trucks		SCAG Trucks	
	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
Baseline 2030																		
SR-47 Mainline, New Dock Ramps to HF Ramps	1,090	1,213	1,124	1,317	1	1	811	496	1,560	1,470	2	2	1,859	905	1,277	516	3	1
Henry Ford Ramps	418	484	423	352	0	0	336	227	640	492	0	0	662	485	474	223	0	0
Henry Ford n/o Ramps to Alameda	547	636	424	406	9	2	418	293	733	556	15	2	874	662	470	245	8	1
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	672	729	702	965	1	1	476	268	920	978	2	2	1,197	420	803	292	3	1
SR-103 Anaheim to PCH	1,025	764	797	805	5	2	972	453	1,080	904	22	7	1,631	672	902	269	13	4
SR-103 PCH to Sepulveda/Willow	872	901	304	346	4	6	853	464	469	476	18	12	1,453	538	445	189	13	3
E and W Harry Bridges, Figueroa to start Alameda	877	749	106	220	5	6	708	700	282	279	15	20	1,049	1,370	170	137	7	16
Alameda beginning (E Harry Bridges) to Anaheim	1,056	1,047	266	256	8	10	826	888	324	294	23	29	1,166	1,513	178	161	8	20
Alameda Anaheim to Henry Ford	693	545	169	213	10	15	293	469	169	213	16	35	716	1,000	122	113	8	29
Alameda Henry Ford to PCH	393	596	551	553	9	15	288	491	733	694	15	35	609	1,071	470	324	8	31
Alameda PCH to 405	2,113	2,454	607	652	52	83	1,755	2,106	864	774	95	130	2,130	2,931	615	338	60	95
Alameda 405 to del Amo	1,989	1,996	441	485	65	80	2,058	1,718	703	627	124	111	2,476	2,272	474	218	80	79
Alameda, del Amo to South Santa Fe Avenue	1,289	1,981	350	284	52	82	1,717	1,487	625	474	112	111	2,531	1,568	384	153	77	66
Alameda, South Santa Fe Avenue to SR-91	1,190	1,161	342	208	48	48	1,273	1,009	470	305	83	70	1,614	1,122	281	119	44	44
I-110, "C" Street Interchange to Anaheim	6,221	4,439	815	821	81	96	5,214	4,924	1,042	864	152	174	5,523	6,949	684	395	100	106
I-110, Anaheim to PCH	5,907	4,571	829	825	86	126	4,933	4,902	1,015	868	162	196	5,183	6,840	695	391	116	122
1-110, PCH to Sepulveda	6,878	4,589	835	832	110	154	5,869	5,570	1,045	870	219	237	6,051	7,640	697	390	161	146
I-110, Sepulveda to Carson	7,712	5,414	768	786	166	199	6,640	6,604	963	824	338	306	6,991	8,605	635	366	232	193
I-110, Carson to Del Amo	8,110	6,904	735	746	166	226	7,068	7,109	930	764	338	342	7,474	9,051	604	347	232	213
I-110, Del Amo to 405	8,527	7,646	711	718	243	262	7,433	7,730	886	739	459	392	7,908	9,678	579	340	279	244
I-110, 405 to SR-91	12,088	6,548	618	630	425	242	10,965	6,461	769	622	963	353	12,311	7,839	578	287	514	215
I-710, Anaheim to PCH	3,003	3,350	2,325	2,181	64	69	2,817	3,273	2,500	2,176	109	128	3,972	4,713	2,116	1,222	74	111
I-710, PCH to Willow	3,248	3,352	2,310	2,364	74	77	2,977	3,334	2,500	2,354	125	132	4,064	4,845	2,183	1,249	83	120
I-710, Willow to 405	3,284	3,978	2,289	2,393	74	87	2,972	3,730	2,478	2,354	126	144	6,546	5,391	2,174	1,249	157	131
I-710, 405 to Del Amo	5,156	5,772	2,050	2,208	125	134	5,109	4,959	2,216	2,186	230	232	6,546	6,335	1,993	1,189	157	195
I-710, Del Amo to Long Beach Blvd Interchange	4,972	5,626	2,012	2,126	135	149	4,963	4,941	2,155	2,131	235	254	6,290	6,393	1,940	1,165	156	213
I-710, Long Beach Boulevard to SR-91	5,178	8,205	1,975	2,187	225	300	6,554	7,152	2,096	2,134	398	436	8,464	8,356	1,885	1,169	289	316
PCH, I110 to Alameda	2,234	2,088	91	103	41	49	1,914	1,862	127	111	82	88	2,305	2,622	64	59	58	54
PCH, Alameda to SR-103	1,039	1,268	202	126	12	23	1,087	1,055	165	208	39	45	1,227	1,615	59	64	23	24
PCH, SR-103 to I-710	899	1,024	488	381	21	26	625	753	546	412	33	36	820	1,425	475	103	18	32
Sepulveda, I-110 to Avalon	927	1,142	33	18	19	22	907	1,028	46	23	50	48	1,077	1,136	35	19	23	29
Sepulveda, Avalon to Alameda	1,136	1,040	50	35	26	32	975	1,038	80	80	58	54	1,066	1,309	43	42	25	33
Sepulveda, Alameda to ICTF	471	613	117	130	6	11	266	327	254	232	13	14	692	394	48	222	18	8
Sepulveda, ICTF to SR-103	395	376	346	304	4	9	181	207	476	469	10	12	538	284	189	445	15	5
Del Amo, I-110 to Wilmington	1,220	1,121	22	25	26	27	1,056	1,159	40	30	63	54	1,117	1,363	19	11	33	31
Del Amo, Wilminton to Alameda	899	1,715	92	48	48	42	1,379	1,560	62	57	89	99	1,849	1,374	14	62	49	61
Del Amo, Alameda to I-710	1,350	2,597	66	45	52	58	1,825	2,079	42	68	92	106	2,449	196	20	63	49	64
223rd Street, I-110 to Avalon	1,155	1,150	9	4	29	26	1,134	1,139	9	8	47	47	1,176	1,247	5	1	31	27
223rd Street, Avalon to Wilmington	1,089	791	10	1	28	25	972	994	10	1	48	44	1,011	1,133	3	1	27	25
223rd Street, Wilmington to Alameda	710	1,329	70	66	38	47	986	1,293	31	59	88	90	1,281	1,309	39	40	45	58
W Wardlow from Alameda to I-710	1,443	1,764	48	39	65	40	1,376	1,870	92	48	109	88	1,652	2,075	47	4	63	48

SR-47 Traffic Data
2015 Alternative 1 Peak Hour Counts

Scenario / Road Segments	NB+SB AM Peak Hours (08-09)				NB+SB Midday Peak Hours (14-15)				NB+SB PM Peak Hours (16-17)			
	All Autos	Port Trucks	SCAG Trucks	All Trucks	All Autos	Port Trucks	SCAG Trucks	All Trucks	All Autos	Port Trucks	SCAG Trucks	All Trucks
Alternative 1, 2015												
SR-47 Mainline, New Dock Ramps to HF Ramps	2,594	1,522	13	1,535	1,833	2,205	29	2,234	3,392	1,288	25	1,313
Henry Ford Ramps (Actually is HF+103 Traffic)	1,814	526	4	530	1,368	935	15	950	2,256	486	18	504
Henry Ford n/o Ramps to Alameda	928	312	14	326	535	281	0	281	984	148	0	148
SR-47 Extension, HF Ramps to Alameda	783	996	8	1,004	466	1,271	11	1,282	1,135	803	7	810
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1,240	439	4	443	939	761	15	776	1,504	388	18	406
SR-103 Anaheim to PCH	1,583	541	13	554	1,418	923	39	962	2,000	477	32	509
SR-103 PCH to Sepulveda/Willow	1,909	308	25	333	1,775	413	65	478	2,287	244	42	286
E and W Harry Bridges, Figueroa to start Alameda	1,313	268	11	279	1,108	417	19	436	1,360	269	9	278
Alameda beginning (E Harry Bridges) to Anaheim	1,761	440	18	458	1,586	532	46	578	2,312	302	28	330
Alameda Anaheim to Henry Ford	1,010	327	31	358	854	329	60	389	1,471	216	44	260
Alameda, Henry Ford to PCH	1,056	444	32	476	974	535	63	598	1,568	324	46	370
Alameda PCH to 405	3,664	1,316	106	1,422	2,722	1,648	148	1,796	4,166	1,061	123	1,184
Alameda 405 to del Amo	3,627	744	103	847	3,143	1,065	195	1,260	3,931	702	132	834
Alameda, del Amo to South Santa Fe Avenue	2,946	1,003	115	1,118	3,065	1,357	190	1,547	3,082	793	129	922
Alameda, South Santa Fe Avenue to SR-91	1,833	393	59	452	1,677	561	119	680	2,356	414	74	488
I-110, "C" Street Interchange to Anaheim	9,175	1,040	150	1,190	8,636	1,385	281	1,666	10,529	804	174	978
I-110, Anaheim to PCH	9,493	1,065	187	1,252	8,745	1,391	323	1,714	10,815	815	218	1,033
1-110, PCH to Sepulveda	11,423	1,094	244	1,338	10,545	1,444	421	1,865	12,602	828	287	1,115
I-110, Sepulveda to Carson	12,722	1,051	312	1,363	11,830	1,367	543	1,910	13,903	778	358	1,136
I-110, Carson to Del Amo	14,596	1,018	368	1,386	13,484	1,318	617	1,935	15,794	738	426	1,164
I-110, Del Amo to 405	15,596	991	416	1,407	14,371	1,277	733	2,010	16,828	713	497	1,210
I-110, 405 to SR-91	17,833	872	617	1,489	16,468	1,136	1,115	2,251	19,305	696	700	1,396
I-710, Anaheim to PCH	7,317	2,625	142	2,767	6,763	2,953	245	3,198	8,749	2,064	187	2,251
I-710, PCH to Willow	8,003	2,768	183	2,951	7,394	3,224	290	3,514	9,714	2,176	214	2,390
I-710, Willow to 405	8,572	2,753	196	2,949	7,745	3,210	307	3,517	10,277	2,165	228	2,393
I-710, 405 to Del Amo	11,877	2,708	314	3,022	10,872	3,003	530	3,533	13,477	2,016	361	2,377
I-710, Del Amo to Long Beach Blvd Interchange	11,697	2,677	340	3,017	10,695	2,961	565	3,526	13,384	2,005	383	2,388
I-710, Long Beach Boulevard to SR-91	15,015	2,668	535	3,203	13,870	2,932	796	3,728	16,588	1,988	584	2,572
PCH, I110 to Alameda	3,426	172	63	235	2,935	249	121	370	4,088	126	91	217
PCH, Alameda to SR-103	2,176	44	36	80	2,002	66	88	154	2,339	31	51	82
PCH, SR-103 to I-710	2,293	358	53	411	1,760	651	78	729	2,355	297	51	348
Sepulveda, I-110 to Avalon	1,968	19	37	56	1,802	35	72	107	2,034	29	46	75
Sepulveda, Avalon to Alameda	2,026	29	53	82	1,871	67	86	153	2,210	49	49	98
Sepulveda, Alameda to ICTF	1,120	117	20	137	949	173	42	215	1,215	89	29	118
Sepulveda, ICTF to SR-103	841	308	16	324	739	413	36	449	962	244	25	269
Del Amo, I-110 to Wilmington	1,956	21	42	63	1,649	29	70	99	1,982	21	37	58
Del Amo, Wilminton to Alameda	2,433	102	82	184	2,599	107	160	267	2,912	61	101	162
Del Amo, Alameda to I-710	3,463	93	96	189	3,450	113	172	285	3,962	98	111	209
223rd Street, I-110 to Avalon	1,952	5	42	47	1,792	7	80	87	2,138	6	53	59
223rd Street, Avalon to Wilmington	1,424	4	36	40	1,501	3	80	83	1,617	1	43	44
223rd Street, Wilmington to Alameda	1,721	56	70	126	1,986	109	148	257	2,368	56	92	148
W Wardlow from Alameda to I-710	2,530	15	53	68	2,470	32	106	138	3,013	5	74	79

SR-47 Traffic Data
2015 Alternative 1 Peak Hour Counts

Scenario / Road Segments	Counts AM Peak Hours						Counts Midday Peak Hours						Counts PM Peak Hours					
	Autos		Port Trucks		SCAG Trucks		Autos		Port Trucks		SCAG Trucks		Autos		Port Trucks		SCAG Trucks	
	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
Alternative 1, 2015																		
SR-47 Mainline, New Dock Ramps to HF Ramps	1,327	1,267	581	941	6	7	1,141	692	1,190	1,015	14	15	2,140	1,252	894	394	13	12
Henry Ford Ramps (Actually is HF+103 Traffic)	826	988	120	406	1	3	881	487	506	429	11	4	1,408	848	321	165	10	8
Henry Ford n/o Ramps to Alameda	412	516	105	207	0	14	333	202	133	148	0	0	635	349	100	48	0	0
SR-47 Extension, HF Ramps to Alameda	504	279	461	535	4	4	260	206	686	585	2	9	732	403	573	230	2	5
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	566	674	85	354	1	3	608	331	438	323	11	4	927	577	265	123	10	8
SR-103 Anaheim to PCH	918	665	152	389	10	3	1,087	331	532	391	33	6	1,429	571	328	149	24	8
SR-103 PCH to Sepulveda/Willow	911	998	127	181	10	15	1,097	678	202	211	35	30	1,484	803	145	99	26	16
E and W Harry Bridges, Figueroa to start Alameda	658	655	132	136	8	3	585	523	197	220	10	9	624	736	144	125	3	6
Alameda beginning (E Harry Bridges) to Anaheim	883	878	232	208	8	10	708	878	280	252	19	27	1,034	1,278	155	147	11	17
Alameda Anaheim to Henry Ford	499	511	149	178	13	18	336	518	161	168	22	38	555	916	108	108	14	30
Alameda, Henry Ford to PCH	516	540	207	237	14	18	385	589	268	267	22	41	601	967	188	136	16	30
Alameda PCH to 405	1,804	1,860	620	696	44	62	1,317	1,405	877	771	61	87	1,778	2,388	721	340	51	72
Alameda 405 to del Amo	1,753	1,874	316	428	45	58	1,679	1,464	603	462	100	95	2,089	1,842	507	195	64	68
Alameda, del Amo to South Santa Fe Avenue	1,113	1,833	517	486	42	73	1,374	1,691	827	530	84	106	1,597	1,485	555	238	64	65
Alameda, South Santa Fe Avenue to SR-91	927	906	201	192	34	25	839	838	352	209	61	58	1,370	986	314	100	35	39
I-110, "C" Street Interchange to Anaheim	5,404	3,771	444	596	71	79	4,430	4,206	753	632	136	145	4,485	6,044	513	291	89	85
I-110, Anaheim to PCH	5,467	4,026	462	603	82	105	4,398	4,347	759	632	156	167	4,589	6,226	527	288	109	109
1-110, PCH to Sepulveda	6,621	4,802	478	616	106	138	5,402	5,143	801	643	211	210	5,546	7,056	541	287	152	135
I-110, Sepulveda to Carson	7,491	5,231	458	593	147	165	6,288	5,542	748	619	301	242	6,588	7,315	500	278	199	159
I-110, Carson to Del Amo	8,000	6,596	443	575	158	210	6,783	6,701	722	596	324	293	7,132	8,662	475	263	217	209
I-110, Del Amo to 405	8,303	7,293	433	558	173	243	7,073	7,298	700	577	397	336	7,566	9,262	457	256	259	238
I-110, 405 to SR-91	11,686	6,147	400	472	396	221	10,569	5,899	659	477	819	296	11,765	7,540	475	221	487	213
I-710, Anaheim to PCH	3,585	3,732	1,125	1,500	66	76	3,078	3,685	1,529	1,424	111	134	4,074	4,675	1,268	796	73	114
I-710, PCH to Willow	4,169	3,834	1,125	1,643	92	91	3,556	3,838	1,722	1,502	148	142	4,697	5,017	1,357	819	95	119
I-710, Willow to 405	4,191	4,381	1,110	1,643	90	106	3,530	4,215	1,708	1,502	148	159	4,701	5,576	1,346	819	94	134
I-710, 405 to Del Amo	5,877	6,000	1,089	1,619	166	148	5,630	5,242	1,501	1,502	294	236	7,092	6,385	1,217	799	167	194
I-710, Del Amo to Long Beach Blvd Interchange	5,751	5,946	1,105	1,572	177	163	5,551	5,144	1,468	1,493	304	261	7,027	6,357	1,203	802	170	213
I-710, Long Beach Boulevard to SR-91	6,929	8,086	1,086	1,582	248	287	6,625	7,245	1,446	1,486	387	409	8,385	8,203	1,183	805	256	328
PCH, I110 to Alameda	1,690	1,736	107	65	27	36	1,473	1,462	120	129	55	66	1,798	2,290	64	62	44	47
PCH, Alameda to SR-103	1,003	1,173	33	11	11	25	921	1,081	30	36	34	54	1,074	1,265	26	5	22	29
PCH, SR-103 to I-710	1,291	1,002	114	244	29	24	936	824	414	237	44	34	1,082	1,273	227	70	25	26
Sepulveda, I-110 to Avalon	917	1,051	8	11	17	20	869	933	33	2	34	38	1,024	1,010	24	5	21	25
Sepulveda, Avalon to Alameda	1,069	957	18	11	22	31	878	993	47	20	39	47	992	1,218	35	14	23	26
Sepulveda, Alameda to ICTF	470	650	59	58	7	13	431	518	96	77	18	24	617	598	41	48	16	13
Sepulveda, ICTF to SR-103	407	434	181	127	6	10	333	406	211	202	15	21	450	512	99	145	14	11
Del Amo, I-110 to Wilmington	930	1,026	9	12	20	22	735	914	14	15	31	39	757	1,225	13	8	15	22
Del Amo, Wilminton to Alameda	824	1,609	78	24	42	40	1,156	1,443	63	44	71	89	1,686	1,226	16	45	44	57
Del Amo, Alameda to I-710	1,162	2,301	64	29	42	54	1,603	1,847	41	72	74	98	2,134	1,828	44	54	46	65
223rd Street, I-110 to Avalon	951	1,001	1	4	22	20	915	877	2	5	39	41	1,045	1,093	5	1	27	26
223rd Street, Avalon to Wilmington	802	622	4	0	19	17	772	729	2	1	40	40	807	810	1	0	22	21
223rd Street, Wilmington to Alameda	470	1,251	26	30	18	52	829	1,157	56	53	64	84	1,138	1,230	33	23	37	55
W Wardlow from Alameda to I-710	1,063	1,467	1	14	25	28	1,118	1,352	19	13	45	61	1,480	1,533	1	4	35	39

SR-47 Traffic Data
2030 Alternative 1 Peak Hour Counts

Scenario / Road Segments	NB+SB AM Peak Hours (08-09)				NB+SB Midday Peak Hours (14-15)				NB+SB PM Peak Hours (16-17)			
	All Autos	Port Trucks	SCAG Trucks	All Trucks	All Autos	Port Trucks	SCAG Trucks	All Trucks	All Autos	Port Trucks	SCAG Trucks	All Trucks
Alternative 1, 2030												
SR-47 Mainline, New Dock Ramps to HF Ramps	2,998	2,804	9	2,813	2,113	3,375	29	3,404	3,853	2,124	16	2,140
Henry Ford Ramps (Actually is HF + 103 Traffiic)	2,381	1,308	4	1,312	1,625	1,725	22	1,747	2,724	1,001	11	1,012
Henry Ford n/o Ramps to Alameda	1,179	346	0	346	756	687	28	715	1,427	341	14	355
SR-47 Extension, HF Ramps to Alameda	619	1,495	4	1,499	488	1,651	10	1,661	1,129	1,122	4	1,126
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1,528	1,185	4	1,189	1,111	1,369	18	1,387	1,765	824	10	834
SR-103 Anaheim to PCH	2,215	1,162	13	1,175	1,950	1,518	53	1,571	2,831	958	32	990
SR-103 PCH to Sepulveda/Willow	2,436	598	25	623	2,049	800	69	869	2,771	504	36	540
E and W Harry Bridges, Figueroa to start Alameda	1,330	320	10	330	1,262	521	30	551	2,315	291	23	314
Alameda beginning (E Harry Bridges) to Anaheim	2,139	494	19	513	1,775	576	53	629	2,903	325	33	358
Alameda Anaheim to Henry Ford	1,344	341	30	371	1,065	369	69	438	1,829	228	47	275
Alameda, Henry Ford to PCH	1,228	616	29	645	946	848	67	915	1,833	438	48	486
Alameda PCH to 405	3,818	1,885	107	1,992	2,930	2,228	174	2,402	4,573	1,442	142	1,584
Alameda 405 to del Amo	3,585	1,313	126	1,439	3,316	1,644	208	1,852	4,346	952	151	1,103
Alameda, del Amo to South Santa Fe Avenue	2,946	1,003	115	1,118	2,765	1,357	192	1,549	3,722	793	129	922
Alameda, South Santa Fe Avenue to SR-91	2,099	705	82	787	1,909	852	122	974	2,625	562	87	649
I-110, "C" Street Interchange to Anaheim	10,328	1,492	179	1,671	9,880	1,771	315	2,086	11,927	966	198	1,164
I-110, Anaheim to PCH	10,346	1,510	210	1,720	9,868	1,788	356	2,144	11,931	976	240	1,216
1-110, PCH to Sepulveda	12,122	1,551	268	1,819	11,608	1,850	468	2,318	13,668	999	307	1,306
I-110, Sepulveda to Carson	13,328	1,471	340	1,811	13,783	1,755	651	2,406	15,129	930	413	1,343
I-110, Carson to Del Amo	15,129	1,416	395	1,811	14,274	1,679	684	2,363	16,565	888	448	1,336
I-110, Del Amo to 405	16,256	1,373	506	1,879	15,337	1,622	863	2,485	17,593	861	522	1,383
I-110, 405 to SR-91	18,701	1,248	670	1,918	17,445	1,426	1,274	2,700	20,255	858	745	1,603
I-710, Anaheim to PCH	6,538	3,812	131	3,943	6,389	4,239	246	4,485	8,711	3,019	190	3,209
I-710, PCH to Willow	7,115	4,200	162	4,362	6,709	4,417	273	4,690	9,038	3,057	208	3,265
I-710, Willow to 405	7,763	4,175	175	4,350	7,312	4,400	293	4,693	9,730	3,049	223	3,272
I-710, 405 to Del Amo	11,453	3,863	280	4,143	10,665	4,111	523	4,634	13,402	2,907	364	3,271
I-710, Del Amo to Long Beach Blvd Interchange	11,136	3,804	203	4,007	10,482	4,015	553	4,568	13,107	2,839	380	3,219
I-710, Long Beach Boulevard to SR-91	15,098	3,842	562	4,404	13,866	4,036	857	4,893	17,148	2,815	600	3,415
PCH, I110 to Alameda	3,939	281	68	349	3,443	365	132	497	4,769	174	91	265
PCH, Alameda to SR-103	2,610	69	42	111	2,697	110	116	226	2,861	31	53	84
PCH, SR-103 to I-710	2,104	689	49	738	1,687	871	90	961	2,242	516	50	566
Sepulveda, I-110 to Avalon	1,870	47	38	85	1,955	75	91	166	2,254	54	51	105
Sepulveda, Avalon to Alameda	2,113	88	54	142	1,961	163	105	268	2,457	94	57	151
Sepulveda, Alameda to ICTF	1,094	215	18	233	671	373	38	411	1,279	129	29	158
Sepulveda, ICTF to SR-103	802	598	14	612	456	800	31	831	993	504	25	529
Del Amo, I-110 to Wilmington	2,175	32	37	69	2,210	60	85	145	2,431	25	64	89
Del Amo, Wilminton to Alameda	2,673	129	93	222	2,834	115	181	296	3,084	82	102	184
Del Amo, Alameda to I-710	3,860	137	107	244	3,894	124	197	321	4,263	74	110	184
223rd Street, I-110 to Avalon	2,301	12	54	66	2,339	18	106	124	2,408	6	60	66
223rd Street, Avalon to Wilmington	1,705	6	51	57	2,013	21	105	126	2,188	2	55	57
223rd Street, Wilmington to Alameda	2,071	151	83	234	2,355	110	180	290	2,723	70	107	177
W Wardlow from Alameda to I-710	2,980	15	62	77	3,321	197	183	380	3,545	214	113	327

SR-47 Traffic Data
2030 Alternative 1 Peak Hour Counts

Scenario / Road Segments	Counts AM Peak Hours						Counts Midday Peak Hours						Counts PM Peak Hours					
	Autos		Port Trucks		SCAG Trucks		Autos		Port Trucks		SCAG Trucks		Autos		Port Trucks		SCAG Trucks	
	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
Alternative 1, 2030																		
SR-47 Mainline, New Dock Ramps to HF Ramps	1,529	1,469	1,309	1,495	3	6	1,326	787	1,751	1,624	17	12	2,530	1,323	1,465	659	9	7
Henry Ford Ramps (Actually is HF + 103 Traffiic)	1,253	1,128	522	786	3	1	1,025	600	850	875	14	8	1,743	981	677	324	8	3
Henry Ford n/o Ramps to Alameda	552	627	176	170	0	0	420	336	429	258	23	5	800	627	257	84	13	1
SR-47 Extension, HF Ramps to Alameda	276	343	786	709	0	4	302	186	901	750	2	8	788	341	787	335	0	4
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	835	693	457	728	3	1	707	404	668	701	14	4	1,168	597	549	275	7	3
SR-103 Anaheim to PCH	1,471	744	540	622	12	1	1,411	539	795	723	45	8	1,907	924	675	283	23	9
SR-103 PCH to Sepulveda/Willow	1,363	1,073	257	341	12	13	1,233	816	415	385	40	29	1,821	950	308	196	22	14
E and W Harry Bridges, Figueroa to start Alameda	665	665	181	139	5	5	673	589	248	273	12	18	953	1,362	148	143	6	17
Alameda beginning (E Harry Bridges) to Anaheim	1,064	1,075	245	249	8	11	846	929	289	287	22	31	1,162	1,741	158	167	10	23
Alameda Anaheim to Henry Ford	714	630	150	191	12	18	520	545	167	202	26	43	715	1,114	109	119	13	34
Alameda, Henry Ford to PCH	542	686	302	314	11	18	352	594	429	419	23	44	635	1,198	257	181	13	35
Alameda PCH to 405	1,626	2,192	984	901	39	68	1,288	1,642	1,201	1,027	69	105	1,960	2,613	975	467	55	87
Alameda 405 to del Amo	1,736	1,849	667	646	54	72	1,828	1,488	963	681	108	100	2,230	2,116	658	294	73	78
Alameda, del Amo to South Santa Fe Avenue	1,113	1,833	517	486	42	73	1,374	1,391	827	530	86	106	2,237	1,485	555	238	64	65
Alameda, South Santa Fe Avenue to SR-91	998	1,101	430	275	37	45	999	910	513	339	61	61	1,525	1,100	369	193	41	46
I-110, "C" Street Interchange to Anaheim	6,030	4,298	761	731	81	98	5,082	4,798	965	806	149	166	5,268	6,659	608	358	98	100
I-110, Anaheim to PCH	5,899	4,447	773	737	89	121	4,944	4,924	977	811	159	197	5,121	6,810	616	360	116	124
1-110, PCH to Sepulveda	6,942	5,180	790	761	113	155	5,908	5,700	1,023	827	218	250	6,065	7,603	641	358	162	145
I-110, Sepulveda to Carson	7,753	5,575	737	734	159	181	7,101	6,682	953	802	337	314	7,043	8,086	585	345	219	194
I-110, Carson to Del Amo	8,168	6,961	710	706	167	228	7,101	7,173	923	756	337	347	7,566	8,999	559	329	234	214
I-110, Del Amo to 405	8,565	7,691	689	684	243	263	7,535	7,802	888	734	459	404	7,933	9,660	539	322	276	246
I-110, 405 to SR-91	12,111	6,590	645	603	428	242	10,917	6,528	798	628	908	366	12,372	7,883	577	281	526	219
I-710, Anaheim to PCH	3,092	3,446	1,793	2,019	65	66	3,053	3,336	2,232	2,007	119	127	4,012	4,699	1,929	1,090	76	114
I-710, PCH to Willow	3,564	3,551	2,011	2,189	81	81	3,258	3,451	2,240	2,177	137	136	4,213	4,825	1,920	1,137	88	120
I-710, Willow to 405	3,600	4,163	1,986	2,189	81	94	3,291	4,021	2,223	2,177	137	156	4,249	5,481	1,912	1,137	88	135
I-710, 405 to Del Amo	5,496	5,957	1,802	2,061	139	141	5,509	5,156	1,991	2,120	282	241	6,952	6,450	1,802	1,105	169	195
I-710, Del Amo to Long Beach Blvd Interchange	5,290	5,846	1,821	1,983	149	54	5,363	5,119	1,957	2,058	292	261	6,752	6,355	1,753	1,086	170	210
I-710, Long Beach Boulevard to SR-91	6,814	8,284	1,792	2,050	236	326	6,749	7,117	1,920	2,116	439	418	8,754	8,394	1,719	1,096	302	298
PCH, I110 to Alameda	1,966	1,973	154	127	32	36	1,622	1,821	176	189	61	71	2,123	2,646	81	93	47	44
PCH, Alameda to SR-103	1,175	1,435	48	21	13	29	1,217	1,480	47	63	45	71	1,314	1,547	21	10	23	30
PCH, SR-103 to I-710	1,059	1,045	354	335	22	27	788	899	455	416	38	52	879	1,363	404	112	21	29
Sepulveda, I-110 to Avalon	897	973	30	17	18	20	943	1,012	57	18	45	46	1,067	1,187	37	17	23	28
Sepulveda, Avalon to Alameda	1,098	1,015	53	35	26	28	962	999	86	77	51	54	1,070	1,387	53	41	26	31
Sepulveda, Alameda to ICTF	431	663	121	94	6	12	351	320	179	194	20	18	674	605	50	79	17	12
Sepulveda, ICTF to SR-103	361	441	341	257	4	10	248	208	385	415	16	15	516	477	196	308	15	10
Del Amo, I-110 to Wilmington	1,220	955	19	13	18	19	1,046	1,164	32	28	32	53	1,103	1,328	16	9	33	31
Del Amo, Wilminton to Alameda	889	1,784	90	39	48	45	1,338	1,496	53	62	86	95	1,752	1,332	17	65	45	57
Del Amo, Alameda to I-710	1,281	2,579	104	33	51	56	1,754	2,140	68	56	92	105	2,395	1,868	19	55	48	62
223rd Street, I-110 to Avalon	1,157	1,144	5	7	29	25	1,211	1,128	10	8	56	50	1,175	1,233	4	2	31	29
223rd Street, Avalon to Wilmington	918	787	5	1	25	26	1,057	956	11	10	58	47	1,018	1,170	2	0	28	27
223rd Street, Wilmington to Alameda	716	1,355	81	70	36	47	1,043	1,312	61	49	89	91	1,312	1,411	42	28	45	62
W Wardlow from Alameda to I-710	1,252	1,728	4	11	33	29	1,352	1,969	135	62	107	76	1,697	1,848	188	26	68	45

SR-47 Traffic Data
2015 Alternative 2 Peak Hour Counts

Scenario / Road Segments	NB+SB AM Peak Hours (08-09)				NB+SB Midday Peak Hours (14-15)				NB+SB PM Peak Hours (16-17)			
	All Autos	Port Trucks	SCAG Trucks	All Trucks	All Autos	Port Trucks	SCAG Trucks	All Trucks	All Autos	Port Trucks	SCAG Trucks	All Trucks
2015, Alternative 2												
SR-47 Mainline, New Dock Ramps to HF Ramps	2,251	1,528	6	1,534	1,645	2,281	18	2,299	2,851	1,194	17	1,211
Henry Ford Ramps	652	152	0	152	540	287	0	287	1,008	152	0	152
Henry Ford n/o Ramps to Alameda	191	200	0	200	612	386	0	386	1,205	189	0	189
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1,598	1,366	6	1,372	1,104	1,993	17	2,010	1,843	1,043	17	1,060
SR-103 Anaheim to PCH	2,379	1,540	21	1,561	1,858	2,232	44	2,276	2,947	1,217	42	1,259
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	2,868	1,304	40	1,344	2,317	1,878	71	1,949	3,461	1,032	74	1,106
SR-103 Ramps south of Sepulveda/Willow	1,708	248	18	266	1,458	333	42	375	2,007	206	34	240
SR-103, Realignment to End (223rd/Wardlow)	1,161	1,056	22	1,078	859	1,544	28	1,572	1,452	824	40	864
E and W Harry Bridges, Figueroa to start Alameda	1,316	254	12	266	917	493	13	506	1,247	212	15	227
Alameda beginning (E Harry Bridges) to Anaheim	1,830	449	21	470	1,610	554	47	601	2,292	323	28	351
Alameda Anaheim to Henry Ford	1,016	338	30	368	815	381	55	436	1,386	228	44	272
Alameda, Henry Ford to PCH	1,066	531	30	561	895	689	56	745	1,633	372	45	417
Alameda PCH to 405	3,704	454	112	566	3,173	598	184	782	4,330	337	140	477
Alameda 405 to del Amo	3,723	815	108	923	3,483	1,186	212	1,398	4,163	740	135	875
Alameda, del Amo to South Santa Fe Avenue	2,903	1,117	122	1,239	2,789	1,503	183	1,686	3,693	931	128	1,059
Alameda, South Santa Fe Avenue to SR-91	1,986	426	65	491	1,849	725	125	850	2,563	386	80	466
I-110, "C" Street Interchange to Anaheim	9,292	1,037	153	1,190	7,926	836	256	1,092	10,694	793	174	967
I-110, Anaheim to PCH	9,526	1,057	186	1,243	8,868	1,365	330	1,695	10,779	803	213	1,016
1-110, PCH to Sepulveda	11,405	1,083	246	1,329	10,507	1,377	416	1,793	12,630	809	284	1,093
I-110, Sepulveda to Carson	12,714	1,031	314	1,345	11,749	1,296	527	1,823	13,870	760	356	1,116
I-110, Carson to Del Amo	13,934	958	365	1,323	13,498	1,240	609	1,849	15,655	716	420	1,136
I-110, Del Amo to 405	15,608	958	469	1,427	14,285	1,202	718	1,920	16,754	690	493	1,183
I-110, 405 to SR-91	17,881	835	616	1,451	16,427	1,059	1,095	2,154	19,227	681	705	1,386
I-710, Anaheim to PCH	7,254	2,549	145	2,694	6,868	2,808	258	3,066	8,677	2,090	184	2,274
I-710, PCH to Willow	7,953	2,717	183	2,900	7,375	2,978	295	3,273	9,520	2,163	210	2,373
I-710, Willow to 405	8,501	2,703	197	2,900	7,721	2,965	309	3,274	10,074	2,151	226	2,377
I-710, 405 to Del Amo	11,828	2,671	314	2,985	10,597	2,893	498	3,391	13,416	2,040	363	2,403
I-710, Del Amo to Long Beach Blvd Interchange	11,727	2,639	339	2,978	10,562	2,834	542	3,376	13,300	2,052	389	2,441
I-710, Long Beach Boulevard to SR-91	13,797	2,645	531	3,176	13,770	2,823	779	3,602	16,483	2,032	553	2,585
PCH, I-110 to Alameda	3,489	134	74	208	3,068	182	140	322	3,956	109	106	215
PCH, Alameda to SR-103	2,105	39	34	73	1,768	42	66	108	2,307	20	49	69
PCH, SR-103 to I-710	2,364	374	57	431	1,839	530	83	613	2,380	251	67	318
Sepulveda, I-110 to Avalon	1,768	18	32	50	1,598	34	69	103	1,853	20	38	58
Sepulveda, Avalon to Alameda	1,653	21	41	62	1,418	33	76	109	1,777	17	48	65
Sepulveda, Alameda to ICTF	1,142	74	19	93	1,001	103	44	147	1,186	72	28	100
Sepulveda, ICTF to SR-103	821	248	13	261	766	333	37	370	919	206	24	230
Del Amo, I-110 to Wilmington	1,413	13	48	61	1,573	20	93	113	1,711	15	56	71
Del Amo, Wilminton to Alameda	2,528	104	82	186	2,639	104	162	266	2,966	59	106	165
Del Amo, Alameda to I-710	3,497	97	96	193	2,440	69	125	194	3,895	102	111	213
223rd Street, I-110 to Avalon	1,995	9	43	52	1,810	12	79	91	2,131	10	53	63
223rd Street, Avalon to Wilmington	1,551	13	27	40	1,417	19	71	90	1,665	13	56	69
223rd Street, Wilmington to Alameda	1,789	84	70	154	1,690	188	128	316	2,323	66	95	161
W Wardlow from Alameda to I-710	1,307	90	44	134	1,461	73	135	208	1,716	58	63	121

SR-47 Traffic Data
2015 Alternative 2 Peak Hour Counts

Scenario / Road Segments	Counts AM Peak Hours						Counts Midday Peak Hours						Counts PM Peak Hours					
	Autos		Port Trucks		SCAG Trucks		Autos		Port Trucks		SCAG Trucks		Autos		Port Trucks		SCAG Trucks	
	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
2015, Alternative 2																		
SR-47 Mainline, New Dock Ramps to HF Ramps	1,094	1,157	561	967	2	4	1,058	587	1,245	1,036	11	7	1,877	974	830	364	10	7
Henry Ford Ramps	300	352	55	97	0	0	365	175	174	113	0	0	688	320	94	58	0	0
Henry Ford n/o Ramps to Alameda	73	118	83	117	0	0	393	219	222	164	0	0	812	393	126	63	0	0
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	794	804	496	870	2	4	692	412	1,071	922	11	6	1,189	654	736	307	10	7
SR-103 Anaheim to PCH	1,480	899	605	935	15	6	1,275	583	1,218	1,014	31	13	1,913	1,034	863	354	28	14
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	1,682	1,186	533	771	25	15	1,454	863	1,019	859	43	28	2,176	1,285	694	338	53	21
SR-103 Ramps south of Sepulveda/Willow	787	921	96	152	5	13	841	617	167	166	22	20	1,231	776	119	87	20	14
SR-103, Realignment to End (223rd/Wardlow)	895	266	437	619	19	3	614	245	851	693	21	7	944	508	574	250	33	7
E and W Harry Bridges, Figueroa to start Alameda	667	649	131	123	3	9	437	480	240	253	5	8	744	503	137	75	5	10
Alameda beginning (E Harry Bridges) to Anaheim	890	940	235	214	8	13	734	876	285	269	20	27	1,004	1,288	166	157	10	18
Alameda Anaheim to Henry Ford	519	497	156	182	15	15	319	496	178	203	21	34	496	890	111	117	15	29
Alameda, Henry Ford to PCH	522	544	237	294	14	16	358	537	367	322	21	35	686	947	213	159	16	29
Alameda PCH to 405	1,714	1,990	201	253	42	70	1,474	1,699	321	277	77	107	1,801	2,529	192	145	59	81
Alameda 405 to del Amo	1,914	1,809	302	513	47	61	1,876	1,607	676	510	115	97	2,246	1,917	516	224	71	64
Alameda, del Amo to South Santa Fe Avenue	1,169	1,734	539	578	54	68	1,422	1,367	870	633	85	98	2,182	1,511	673	258	64	64
Alameda, South Santa Fe Avenue to SR-91	959	1,027	190	236	33	32	1,063	786	479	246	80	45	1,607	956	259	127	43	37
I-110, "C" Street Interchange to Anaheim	5,510	3,782	447	590	73	80	3,996	3,930	542	294	122	134	4,608	6,086	501	292	89	85
I-110, Anaheim to PCH	5,480	4,046	460	597	82	104	4,485	4,383	750	615	161	169	4,630	6,149	515	288	108	105
1-110, PCH to Sepulveda	6,638	4,767	481	602	108	138	5,360	5,147	759	618	209	207	5,691	6,939	522	287	154	130
I-110, Sepulveda to Carson	7,553	5,161	455	576	151	163	6,328	5,421	704	592	297	230	6,549	7,321	484	276	200	156
I-110, Carson to Del Amo	7,477	6,457	428	530	154	211	6,783	6,715	676	564	325	284	7,059	8,596	457	259	216	204
I-110, Del Amo to 405	8,263	7,345	428	530	225	244	7,042	7,243	655	547	393	325	7,558	9,196	438	252	259	234
I-110, 405 to SR-91	11,695	6,186	390	445	395	221	10,574	5,853	609	450	810	285	11,724	7,503	464	217	496	209
I-710, Anaheim to PCH	3,454	3,800	1,099	1,450	66	79	3,109	3,759	1,449	1,359	115	143	3,992	4,685	1,295	795	70	114
I-710, PCH to Willow	3,991	3,962	1,147	1,570	89	94	3,488	3,887	1,553	1,425	145	150	4,518	5,002	1,370	793	91	119
I-710, Willow to 405	4,013	4,488	1,134	1,569	87	110	3,471	4,250	1,540	1,425	144	165	4,512	5,562	1,358	793	91	135
I-710, 405 to Del Amo	5,801	6,027	1,120	1,551	167	147	5,467	5,130	1,436	1,457	266	232	6,994	6,422	1,255	785	163	200
I-710, Del Amo to Long Beach Blvd Interchange	5,681	6,046	1,130	1,509	177	162	5,452	5,110	1,409	1,425	281	261	6,943	6,357	1,259	793	170	219
I-710, Long Beach Boulevard to SR-91	5,707	8,090	1,113	1,532	246	285	6,484	7,286	1,383	1,440	365	414	8,342	8,141	1,239	793	254	299
PCH, I-110 to Alameda	1,768	1,721	79	55	29	45	1,528	1,540	95	87	63	77	1,816	2,140	55	54	54	52
PCH, Alameda to SR-103	929	1,176	33	6	11	23	733	1,035	30	12	24	42	1,039	1,268	15	5	22	27
PCH, SR-103 to I-710	1,241	1,123	170	204	27	30	898	941	319	211	41	42	1,087	1,293	213	38	23	44
Sepulveda, I-110 to Avalon	871	897	15	3	12	20	773	825	26	8	32	37	868	985	16	4	18	20
Sepulveda, Avalon to Alameda	647	1,006	17	4	12	29	570	848	24	9	29	47	779	998	12	5	22	26
Sepulveda, Alameda to ICTF	513	629	38	36	8	11	507	494	51	52	21	23	614	572	40	32	16	12
Sepulveda, ICTF to SR-103	443	378	152	96	5	8	404	362	166	167	18	19	451	468	87	119	14	10
Del Amo, I-110 to Wilmington	869	544	7	6	31	17	834	739	12	8	53	40	862	849	11	4	33	23
Del Amo, Wilminton to Alameda	842	1,686	76	28	43	39	1,199	1,440	59	45	75	87	1,698	1,268	15	44	47	59
Del Amo, Alameda to I-710	1,150	2,347	56	41	41	55	1,195	1,245	26	43	55	70	2,091	1,804	60	42	48	63
223rd Street, I-110 to Avalon	953	1,042	1	8	22	21	880	930	2	10	38	41	1,077	1,054	5	5	29	24
223rd Street, Avalon to Wilmington	838	713	5	8	19	8	710	707	8	11	35	36	841	824	6	7	23	33
223rd Street, Wilmington to Alameda	499	1,290	48	36	21	49	1,073	617	100	88	78	50	1,104	1,219	29	37	57	38
W Wardlow from Alameda to I-710	476	831	54	36	19	25	743	718	47	26	48	87	776	940	20	38	20	43

SR-47 Traffic Data
2030 Alternative 2 Peak Hour Counts

Scenario / Road Segments	NB+SB AM Peak Hours (08-09)				NB+SB Midday Peak Hours (14-15)				NB+SB PM Peak Hours (16-17)			
	All Autos	Port Trucks	SCAG Trucks	All Trucks	All Autos	Port Trucks	SCAG Trucks	All Trucks	All Autos	Port Trucks	SCAG Trucks	All Trucks
2030 Alternative 2												
SR-47 Mainline, New Dock Ramps to HF Ramps	2,782	2,852	3	2,855	1,728	3,424	8	3,432	3,395	2,146	10	2,156
Henry Ford Ramps	972	246	0	246	636	479	0	479	1,246	217	0	217
Henry Ford n/o Ramps to Alameda	1,251	574	14	588	780	807	25	832	1,636	356	16	372
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	1,809	2,605	3	2,608	1,094	2,945	7	2,952	2,148	1,928	10	1,938
SR-103 Anaheim to PCH	2,428	2,747	14	2,761	1,962	3,212	39	3,251	3,171	2,139	29	2,168
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	2,815	2,291	27	2,318	2,292	2,649	67	2,716	3,349	1,762	45	1,807
SR-103 Ramps south of Sepulveda/Willow	1,974	477	17	494	1,582	674	39	713	2,094	424	25	449
SR-103, Realignment to End (223rd/Wardlow)	841	1,808	10	1,818	710	1,976	28	2,004	1,254	1,337	19	1,356
E and W Harry Bridges, Figueroa to start Alameda	1,709	427	15	442	1,359	557	29	586	1,942	301	23	324
Alameda beginning (E Harry Bridges) to Anaheim	2,141	515	20	535	1,720	614	55	669	2,787	339	31	370
Alameda Anaheim to Henry Ford	1,363	375	30	405	947	404	64	468	1,729	235	46	281
Alameda, Henry Ford to PCH	1,270	728	29	757	986	966	64	1,030	1,930	445	47	492
Alameda PCH to 405	4,087	609	120	729	3,460	863	213	1,076	4,886	407	155	562
Alameda 405 to del Amo	3,686	1,445	120	1,565	3,318	1,798	207	2,005	4,289	1,135	143	1,278
Alameda, del Amo to South Santa Fe Avenue	2,903	1,117	112	1,229	2,789	1,503	186	1,689	3,693	931	128	1,059
Alameda, South Santa Fe Avenue to SR-91	2,146	767	82	849	1,963	999	127	1,126	2,529	732	77	809
I-110, "C" Street Interchange to Anaheim	10,371	1,435	174	1,609	10,100	1,712	326	2,038	12,095	953	197	1,150
I-110, Anaheim to PCH	10,298	1,449	209	1,658	9,827	1,731	359	2,090	11,913	960	236	1,196
1-110, PCH to Sepulveda	11,982	1,475	267	1,742	11,432	1,736	463	2,199	13,642	957	309	1,266
I-110, Sepulveda to Carson	14,198	1,388	362	1,750	13,764	1,632	648	2,280	15,583	889	411	1,300
I-110, Carson to Del Amo	15,127	1,325	397	1,722	14,375	1,560	690	2,250	16,654	844	450	1,294
I-110, Del Amo to 405	16,262	1,284	511	1,795	15,367	1,509	860	2,369	17,704	818	528	1,346
I-110, 405 to SR-91	18,720	1,181	668	1,849	17,566	1,360	1,266	2,626	20,331	844	736	1,580
I-710, Anaheim to PCH	6,803	3,872	147	4,019	6,465	4,132	249	4,381	8,890	2,930	195	3,125
I-710, PCH to Willow	7,133	3,983	164	4,147	6,754	4,199	276	4,475	9,155	2,941	207	3,148
I-710, Willow to 405	7,800	3,959	173	4,132	7,205	4,180	291	4,471	9,798	2,923	225	3,148
I-710, 405 to Del Amo	11,459	3,830	287	4,117	10,557	3,974	524	4,498	13,529	2,807	368	3,175
I-710, Del Amo to Long Beach Blvd Interchange	11,145	3,795	311	4,106	10,404	3,893	557	4,450	13,140	2,775	382	3,157
I-710, Long Beach Boulevard to SR-91	15,162	3,889	560	4,449	13,945	3,869	899	4,768	17,144	2,742	604	3,346
PCH, I-110 to Alameda	4,174	210	84	294	3,712	240	161	401	4,832	135	109	244
PCH, Alameda to SR-103	2,505	72	39	111	2,434	89	92	181	2,730	43	49	92
PCH, SR-103 to I-710	2,327	598	54	652	1,874	731	95	826	2,415	441	52	493
Sepulveda, I-110 to Avalon	2,026	67	43	110	1,896	55	88	143	2,202	35	52	87
Sepulveda, Avalon to Alameda	2,168	66	59	125	2,006	104	106	210	2,395	41	58	99
Sepulveda, Alameda to ICTF	1,222	128	22	150	973	165	48	213	1,318	105	31	136
Sepulveda, ICTF to SR-103	890	482	18	500	687	674	41	715	1,027	424	24	448
Del Amo, I-110 to Wilmington	2,374	39	63	102	2,162	51	118	169	2,517	25	65	90
Del Amo, Wilminton to Alameda	2,672	129	92	221	2,927	103	187	290	3,194	81	104	185
Del Amo, Alameda to I-710	3,880	155	109	264	3,875	116	197	313	4,233	102	113	215
223rd Street, I-110 to Avalon	2,222	23	54	77	2,200	17	94	111	2,373	13	59	72
223rd Street, Avalon to Wilmington	1,822	24	50	74	1,933	32	93	125	2,110	14	50	64
223rd Street, Wilmington to Alameda	2,041	196	78	274	2,170	203	164	367	2,619	119	94	213
W Wardlow from Alameda to I-710	3,622	283	98	381	3,379	276	179	455	3,664	138	116	254

SR-47 Traffic Data
2030 Alternative 2 Peak Hour Counts

Scenario / Road Segments	Counts AM Peak Hours						Counts Midday Peak Hours						Counts PM Peak Hours					
	Autos		Port Trucks		SCAG Trucks		Autos		Port Trucks		SCAG Trucks		Autos		Port Trucks		SCAG Trucks	
	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
2030 Alternative 2																		
SR-47 Mainline, New Dock Ramps to HF Ramps	1,395	1,387	1,337	1,515	1	2	1,122	606	1,763	1,661	5	3	2,227	1,168	1,489	657	7	3
Henry Ford Ramps	476	496	124	122	0	0	416	220	234	245	0	0	802	444	148	69	0	0
Henry Ford n/o Ramps to Alameda	593	658	352	222	12	2	493	287	474	333	23	2	1,012	624	254	102	14	2
SR-103 begin (at SR-47 /Henry Ford Jnctn) to Anaheim	918	891	1,212	1,393	1	2	708	386	1,528	1,417	5	2	1,425	723	1,342	586	7	3
SR-103 Anaheim to PCH	1,470	958	1,362	1,385	10	4	1,363	599	1,720	1,492	29	10	1,970	1,201	1,507	632	18	11
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	1,553	1,262	1,113	1,178	14	13	1,457	835	1,380	1,269	42	25	2,037	1,312	1,181	581	26	19
SR-103 Ramps south of Sepulveda/Willow	986	988	212	265	6	11	940	642	342	332	19	20	1,330	764	250	174	14	11
SR-103, Realignment to End (223rd/Wardlow)	567	274	895	913	7	3	517	193	1,038	938	23	5	708	546	930	407	11	8
E and W Harry Bridges, Figueroa to start Alameda	850	859	187	240	9	6	636	723	276	281	12	17	991	951	157	144	6	17
Alameda beginning (E Harry Bridges) to Anaheim	1,083	1,058	258	257	8	12	783	937	317	297	23	32	1,169	1,618	172	167	10	21
Alameda Anaheim to Henry Ford	738	625	174	201	13	17	393	554	184	220	23	41	720	1,009	116	119	13	33
Alameda, Henry Ford to PCH	574	696	352	376	12	17	403	583	474	492	23	41	836	1,094	254	191	14	33
Alameda PCH to 405	1,859	2,228	274	335	49	71	1,649	1,811	421	442	96	117	2,091	2,795	232	175	63	92
Alameda 405 to del Amo	1,866	1,820	707	738	50	70	1,630	1,688	1,002	796	97	110	2,092	2,197	800	335	68	75
Alameda, del Amo to South Santa Fe Avenue	1,169	1,734	539	578	44	68	1,422	1,367	870	633	88	98	2,182	1,511	673	258	64	64
Alameda, South Santa Fe Avenue to SR-91	1,010	1,136	437	330	37	45	1,060	903	530	469	65	62	1,420	1,109	517	215	38	39
I-110, "C" Street Interchange to Anaheim	6,057	4,314	725	710	83	91	5,198	4,902	927	785	155	171	5,359	6,736	589	364	97	100
I-110, Anaheim to PCH	5,835	4,463	735	714	88	121	4,869	4,958	941	790	158	201	5,133	6,780	597	363	115	121
1-110, PCH to Sepulveda	6,816	5,166	753	722	111	156	5,825	5,607	943	793	218	245	6,085	7,557	598	359	164	145
I-110, Sepulveda to Carson	8,130	6,068	696	692	156	206	7,136	6,628	875	757	340	308	7,008	8,575	551	338	217	194
I-110, Carson to Del Amo	8,130	6,997	670	655	166	231	7,136	7,239	850	710	340	350	7,566	9,088	523	321	234	216
I-110, Del Amo to 405	8,544	7,718	650	634	245	266	7,547	7,820	818	691	463	397	7,953	9,751	502	316	278	250
I-110, 405 to SR-91	12,101	6,619	625	556	424	244	11,012	6,554	766	594	907	359	12,380	7,951	569	275	514	222
I-710, Anaheim to PCH	3,265	3,538	1,944	1,928	72	75	2,987	3,478	2,208	1,924	117	132	4,112	4,778	1,875	1,055	78	117
I-710, PCH to Willow	3,522	3,611	1,931	2,052	81	83	3,106	3,648	2,201	1,998	132	144	4,268	4,887	1,863	1,078	87	120
I-710, Willow to 405	3,554	4,246	1,907	2,052	80	93	3,104	4,101	2,182	1,998	133	158	4,284	5,514	1,845	1,078	87	138
I-710, 405 to Del Amo	5,488	5,971	1,800	2,030	140	147	5,441	5,116	1,941	2,033	284	240	7,027	6,502	1,723	1,084	172	196
I-710, Del Amo to Long Beach Blvd Interchange	5,257	5,888	1,837	1,958	148	163	5,305	5,099	1,922	1,971	293	264	6,792	6,348	1,700	1,075	171	211
I-710, Long Beach Boulevard to SR-91	6,821	8,341	1,809	2,080	233	327	6,652	7,293	1,891	1,978	455	444	8,646	8,498	1,666	1,076	276	328
PCH, I-110 to Alameda	2,116	2,058	98	112	40	44	1,819	1,893	127	113	80	81	2,189	2,643	68	67	55	54
PCH, Alameda to SR-103	1,121	1,384	55	17	13	26	1,084	1,350	60	29	37	55	1,206	1,524	26	17	22	27
PCH, SR-103 to I-710	1,148	1,179	340	258	25	29	755	1,119	439	292	37	58	959	1,456	365	76	22	30
Sepulveda, I-110 to Avalon	911	1,115	46	21	21	22	915	981	39	16	43	45	1,075	1,127	22	13	24	28
Sepulveda, Avalon to Alameda	1,098	1,070	52	14	26	33	976	1,030	55	49	53	53	1,096	1,299	24	17	27	31
Sepulveda, Alameda to ICTF	538	684	60	68	10	12	463	510	84	81	24	24	689	629	55	50	17	14
Sepulveda, ICTF to SR-103	465	425	265	217	8	10	345	342	332	342	20	21	520	507	174	250	13	11
Del Amo, I-110 to Wilmington	1,221	1,153	18	21	37	26	1,041	1,121	27	24	69	49	1,141	1,376	16	9	33	32
Del Amo, Wilminton to Alameda	897	1,775	94	35	48	44	1,403	1,524	56	47	91	96	1,877	1,317	17	64	48	56
Del Amo, Alameda to I-710	1,266	2,614	122	33	48	61	1,773	2,102	66	50	91	106	2,352	1,881	42	60	49	64
223rd Street, I-110 to Avalon	1,102	1,120	7	16	28	26	1,110	1,090	4	13	46	48	1,145	1,228	5	8	31	28
223rd Street, Avalon to Wilmington	997	825	15	9	24	26	992	941	22	10	47	46	1,006	1,104	6	8	26	24
223rd Street, Wilmington to Alameda	641	1,400	108	88	28	50	839	1,331	112	91	75	89	1,300	1,319	62	57	42	52
W Wardlow from Alameda to I-710	1,284	2,338	160	123	61	37	1,369	2,010	143	133	117	62	1,799	1,865	93	45	73	43

APPENDIX D

Summary of Health Risk Assessment Results

Appendix D Contents

Receptor Data in Results Spreadsheet Key

Attached as Digital Media: Receptor Data in Results Spreadsheet

Receptor Data in Results Spreadsheet

Receptors in the results spreadsheets are numbered sequentially according to their order in the AERMOD runs, based on the last 4 digits of the Receptor IDs in the first column. In order to distinguish the Regional and Local grids from the Sensitive grids, 10,000 was added to the Regional receptor numbers, and 20,000 was added to the Local receptor numbers. For example, the 327th receptor in the Local grid AERMOD run is Receptor ID 200327, while the 327th receptor in the Sensitive grid is Receptor ID 327.

Actual land use data (code, polygon number) is only included for Sensitive receptors falling within Level 4 land use codes of:

Level 4 Land Use	**Description**
1111	High-Density Single Family Residential
1112	Low-Density Single Family Residential
1121	Mixed Multi-Family Residential
1122	Duplexes, Triplexes and 2-or 3-Unit Condominiums and Townhouses
1123	Low-Rise Apartments, Condominiums, and Townhouses
1124	Medium-Rise Apartments and Condominiums
1125	High-Rise Apartments and Condominiums
1131	Trailer Parks and Mobile Home Courts, High-Density
1140	Mixed Residential
1261	Pre-Schools/Day Care Centers
1262	Elementary Schools
1263	Junior or Intermediate High Schools
1264	Senior High Schools
1810	Golf Courses
1821	Developed Local Parks and Recreation
1831	Developed Regional Parks and Recreation
1840	Cemeteries
1870	Beach Parks
4300	Marina Water Facilities

These were truncated to the initial 2-digits to form the Level 2 Land Use codes:

11 = Residential

12 = Schools

18 = Recreational

43 = Marinas

To provide smoother interpolation of the results, border regions were defined as the grid cells (square regions centered on the actual receptor locations) that partially intersected any of these polygons. The boundary receptor points lie outside the actual polygons, and therefore were not used in evaluating risks inside the neighboring land uses. A land use code of zero was assigned to these border region sensitive receptors.

For summary purposes, “neighborhoods” were defined (as shown in Figure 3-9 of the report). These regions were grouped into Zones for purposes of creating data summaries (although summaries by Zone were not presented in the Report). The neighborhoods by Zone are as follows:

North Zone
- Dominguez Hills
- Victoria
- Carson
- North Long Beach
- Dominguez
- Lincoln Village

Central Zone
- Long Beach

South Zone
- Wilmington
- Marinas

RecID	Receptor ID
UTME	UTM Easting, Zone 11, NAD 83, meters
UTMN	UTM Northing, Zone 11, NAD 83, meters
Space	Grid spacing
Zone	Numeric code for Group of Regions
Zone$	Text name of Group of Regions
Region	Numeric code for Neighborhoods
Region$	Text name of Neighborhood
LUPolyID	Land Use Polygon ID (from SCAG database)
LU2	Numeric Level 2 Land Use Code
LU2$	Description of Level 2 Land Use category
	70-YEAR EMISSIONS CANCER SHEET
Res70BA	Total Cancer Risk (per million) Residential Exposure, Baseline 70-year Emissions
Res12BA	Cancer Risk (per million), Residential 70-year Average based on 12 years emissions from 2003-2015
Res58A1	Cancer Risk (per million), Residential 70-year Average based on 58 years emissions based on Alternative 1 Traffic Data from 2015-2072
Res58A2	Cancer Risk (per million), Residential 70-year Average based on 58 years emissions based on Alternative 2 Traffic Data from 2015-2072
Res70A1	Total Cancer Risk (per million) Residential Exposure, Alternative 1 70-year average Emissions
Res70A2	Total Cancer Risk (per million) Residential Exposure, Alternative 2 70-year average Emissions
DResA1	Change in Total Cancer Risk (per million), Residential Exposure, Alt 1 - Baseline
DResA2	Change in Total Cancer Risk (per million), Residential Exposure, Alt 2 - Baseline
	2015 EMISSIONS CANCER SHEET
ResBA	Total Cancer Risk (per million) Residential Exposure, No Project, 2015 Emissions
ResA1	Cancer Risk (per million), Residential Exposure, Alternative 1, 2015 Emissions
ResA2	Cancer Risk (per million), Residential Exposure, Alternative 2, 2015 Emissions

DResA1	Change in Total Cancer Risk (per million), Residential Exposure, Alt 1 - No Project, 2015 Emissions
DResA2	Change in Total Cancer Risk (per million), Residential Exposure, Alt 2 - No Project, 2015 Emissions
	HAZARD INDICES SHEET
HIc03	Maximum Chronic Hazard Index, Baseline Emissions (2003)
HIc15NB	Maximum Chronic Hazard Index, No Project based on 2015 Emissions
HIc15A1	Maximum Chronic Hazard Index, Alternative 1 Emissions based on 2015 Emissions
HIc15A2	Maximum Chronic Hazard Index, Alternative 2 Emissions based on 2015 Emissions
HIc30NB	Maximum Chronic Hazard Index, No Project based on 2030 Emissions
HIc30A1	Maximum Chronic Hazard Index, Alternative 1 based on 2030 Emissions
HIc30A2	Maximum Chronic Hazard Index, Alternative 2 Emissions based on 2030 Emissions
HIa03	Maximum Acute Hazard Index, Baseline Emissions (2003)
HIa15NB	Maximum Acute Hazard Index, No Project based on 2015 Emissions
HIa15A1	Maximum Acute Hazard Index, Alternative 1 Emissions based on 2015 Emissions
HIa15A2	Maximum Acute Hazard Index, Alternative 2 Emissions based on 2015 Emissions
HIa30NB	Maximum Acute Hazard Index, No Project based on 2030 Emissions
HIa30A1	Maximum Acute Hazard Index, Alternative 1 based on 2030 Emissions
HIa30A2	Maximum Acute Hazard Index, Alternative 2 based on 2030 Emissions
DHIc15A103	Change in Chronic Hazard Index, 2015 Alt 1 – Baseline (2003)
DHIc15A203	Change in Chronic Hazard Index, 2015 Alt 2 – Baseline (2003)
DHIc30A103	Change in Chronic Hazard Index, 2030 Alt 1 – Baseline (2003)
DHIc30A203	Change in Chronic Hazard Index, 2030 Alt 2 – Baseline (2003)
DHIa15A103	Change in Acute Hazard Index, 2015 Alt 1 – Baseline (2003)
DHIa15A203	Change in Acute Hazard Index, 2015 Alt 2 – Baseline (2003)
DHIa30A103	Change in Acute Hazard Index, 2030 Alt 1 – Baseline (2003)
DHIa30A203	Change in Acute Hazard Index, 2030 Alt 2 – Baseline (2003)
DHIc15A1NB	Change in Chronic Hazard Index, 2015 Alt 1 – No Project 2015
DHIc30A1NB	Change in Chronic Hazard Index, 2030 Alt 1 – No Project 2030
DHIa15A1NB	Change in Acute Hazard Index, 2015 Alt 1 – No Project 2015
DHIa30A1NB	Change in Acute Hazard Index, 2030 Alt 1 – No Project 2030
DHIc15A2NB	Change in Chronic Hazard Index, 2015 Alt 2 – No Project 2015
DHIc30A2NB	Change in Chronic Hazard Index, 2030 Alt 2 – No Project 2030
DHIa15A2NB	Change in Acute Hazard Index, 2015 Alt 2 – No Project 2015
DHIa30A2NB	Change in Acute Hazard Index, 2030 Alt 2 – No Project 2030

APPENDIX E

Contribution Analysis of Health Risk Effects by Pathway and Pollutant

Appendix E Contents

Summary of Top Contributors to Cancer Risks (2015 Emissions), Alternative 1

Derived Cancer Risk by Pathway and Chemical for 2015 Alternative 1

Receptor 1548 Wilmington

Receptor 2274 Long Beach

Receptor 2389 Lincoln Village

Receptor 2535 Dominguez

Summary of Top Contributions to Cancer Risks (2015 emissions), Alternative 1

Top contributers to cancers risks		#1	#2	#3	#4	#5
	Chemical Name	DieselExhPM	1,3-Butadiene	Benzene	Cr(VI)	Formaldehyde
	CAS	9901	106990	71432	18540299	50000
Dominguez	Recepter 2535	96.5%	1.4%	1.1%	0.7%	0.2%
Lincoln Village	Receptor 2389	96.6%	1.4%	1.1%	0.7%	0.2%
Long Beach	Receptor 2274	96.7%	1.4%	1.1%	0.6%	0.2%
Wilmington	Receptor 1548	96.8%	1.2%	0.9%	0.7%	0.2%

DERIVED CANCER RISK, RECEPTOR 1548

CHEM	Name	CAS	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL	
1	DieselExhPM	9901	4.87E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.87E-05	96.8%
9	1,3-Butadiene	106990	6.18E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.18E-07	1.2%
7	Benzene	71432	4.73E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.73E-07	0.94%
12	Cr(VI)	18540299	3.47E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.47E-07	0.69%
15	Formaldehyde	50000	9.67E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.67E-08	0.19%
22	Acetaldehyde	75070	1.24E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.24E-08	0.02%
2	Nickel	7440020	7.70E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.70E-09	0.02%
SUM			5.03E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.03E-05	

DERIVED CANCER RISK, RECEPTOR 2274

CHEM	Name	CAS	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL	
1	DieselExhPM	9901	5.60E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.60E-05	96.7%
9	1,3-Butadiene	106990	8.08E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.08E-07	1.4%
7	Benzene	71432	6.11E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.11E-07	1.1%
12	Cr(VI)	18540299	3.38E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-07	0.58%
15	Formaldehyde	50000	1.16E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.16E-07	0.20%
22	Acetaldehyde	75070	1.21E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.21E-08	0.02%
2	Nickel	7440020	9.88E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.88E-09	0.02%
SUM			5.79E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.79E-05	

DERIVED CANCER RISK, RECEPTOR 2535

CHEM	Name	CAS	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL	
1	DieselExhPM	9901	9.42E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.42E-05	96.5%
9	1,3-Butadiene	106990	1.41E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.41E-06	1.4%
7	Benzene	71432	1.07E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.07E-06	1.1%
12	Cr(VI)	18540299	6.36E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.36E-07	0.65%
15	Formaldehyde	50000	2.08E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.08E-07	0.21%
22	Acetaldehyde	75070	2.27E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.27E-08	0.02%
2	Nickel	7440020	1.73E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.73E-08	0.02%
SUM			9.76E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.76E-05	

DERIVED CANCER RISK, RECEPTOR 2389

CHEM	Name	CAS	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL	
1	DieselExhPM	9901	9.18E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.18E-05	96.6%
9	1,3-Butadiene	106990	1.37E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.37E-06	1.4%
7	Benzene	71432	1.04E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.04E-06	1.1%
12	Cr(VI)	18540299	6.24E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.24E-07	0.66%
15	Formaldehyde	50000	2.02E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.02E-07	0.21%
22	Acetaldehyde	75070	2.23E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.23E-08	0.02%
2	Nickel	7440020	1.69E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.69E-08	0.02%
SUM			9.50E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.50E-05	

DERIVED CHEM	CANCER CAS	RISK, POLLUTANT	RECEPTOR INHAL	2535 DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL	
1	9901	Diesel	1.13E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.13E-04	96.58%
2	75070	Acetaldehyde	1.73E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.73E-08	0.01%
7	71432	Benzene	1.07E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.07E-06	0.91%
9	106990	1,3-Butadiene	1.41E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.41E-06	1.21%
12	18540299	Chromium,	6.36E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.36E-07	0.54%
15	50000	Formaldehyde	2.08E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.08E-07	0.18%
22	7440020	Nickel	2.27E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.27E-08	0.02%
SUM			1.17E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.17E-04	

APPENDIX F

AERMOD Output Files
(Included as digital media)

Appendix F Contents

Description of AERMOD file names

AERMOD Output Files (included as digital media)

AERMOD File Naming

The AERMOD files are named according to the following convention:

pgnss.xxx, where:

p = Pollutant [U for unit-emissions HARP source groups]

g = Receptor Grid [R = Regional, 400 m coarse grid; L = Local 200 m refined grid; S = Sensitive 50/100 m refined grid]

n = Sequential run number [2 for all files]

ss = Scenario [XS = Static regional roads, BA = Baseline, A1 = Alternative 1, A2 = Alternative 2]

xxx = File type [INP = input, OUT = main output, PLT = plotfile, ERR = error listing file, PST = postfile]

For example, UL2BA is the unit-emissions per source group run for the 200 m receptor grid for Baseline project-related roads.

APPENDIX G

HARP Output Files

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Description of HARP file names

HARP v1.3 Output Files (included as digital media)

APPENDIX H

Schuyler Heim Bridge and SR-47 Expressway Traffic Study

Appendix H Contents

Cover Page and Table of Contents for FINAL Traffic Study

FINAL Traffic Study: Schulyer Heim Bridge Replacement and SR-47 Expressway Project, July 2007 (included as digital media)

FINAL

Traffic Study

Schuyler Heim Bridge Replacement and SR-47 Expressway Project

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Prepared By:

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July, 2007

J01-0089

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FINAL

Traffic Study

Schuyler Heim Bridge Replacement and SR-47 Expressway Project

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INTRODUCTION

This report presents the results of an analysis performed to assess existing and future traffic conditions in the vicinity of the proposed Schuyler Heim Bridge Replacement and SR-47 Expressway Project, located in the cities of Long Beach and Los Angeles in Los Angeles County. The analysis examines current traffic volumes and levels of service (LOS), as well as forecast year (Year 2030) traffic volumes and LOS with and without the proposed project. This traffic study has been prepared to provide traffic data and operation analysis for the proposed Expressway and bridge replacement project.

Problem, Deficiencies, Justification

Technical studies conducted by Caltrans have concluded that the existing Schuyler Heim Bridge does not conform to the current seismic criteria. In addition, ACTA identified that the current access from the Terminal Island to Alameda Street is inefficient, limiting its use as an alternate facility to I-110 and I-710.

Following the southern California earthquakes in 1989 and 1994 damaging many area bridges, the California legislature directed Caltrans to devise a program to survey and strengthen affected bridges. Replacement of the Schuyler Heim Bridge complies with California legislation by providing a seismically sound vehicular connection along the critical north-south corridor between Terminal Island and the mainland. Furthermore, the existing transportation system within and adjacent to the ports is becoming increasingly stressed. Expected increases in cargo throughput over the next 25 years will add a considerable amount of rail and vehicular traffic within and adjacent to the ports. Such increases have the potential to seriously compromise essential north-south connectivity between the ports and the regional freeway system, thereby limiting the movement of people, freight, and goods. The proposed bridge replacement will:

- Provide a critical service route that would enable emergency response vehicles to access Terminal Island in the event of an emergency;
- Improve operational and safety of this bridge by upgrading the design features to current standards to the maximum extent possible;
- Greatly reduce future maintenance and operational costs of the bridge;
- Minimize the capital costs of the improvements by maximizing the life span of the bridge.

Currently, in order to connect from Terminal Island to Alameda Street, vehicles must travel 1.5 kilometers north from Ocean Boulevard, exit at the Henry Ford Avenue off-ramp, travel north through local streets (three signalized intersections/five railroad crossings) for about 2.0 kilometers; and then join Alameda Street just south of PCH. Upon completion of the expressway, motorists could travel uninterrupted and at increased speeds, eventually joining PCH, I-405, and SR-91. The proposed expressway would also:

- Provide a safe crossing over the at-grade rail lines at the West Basin lead track, the Union Pacific Rail Road (UPRR) San Pedro Branch, ACTA 3, and the East and West Wilmington

Wye tracks[1] with a daily train crossings of 118, 79, 21, 15 and 8, respectively eliminating approximately four hours[2] of delay per day ;

- Provide an alternate route to both I-710 and I-110 in the event of an earthquake disrupting service of both the Gerald Desmond Bridge (GDB) and Vincent Thomas Bridge (VTB);
- Provide a safe crossing over the signalized intersections at Henry Ford Avenue, Anaheim Street, and Denni Street;
- Help maximize use of the recently completed six-lane Alameda Street;

Regional and System Planning

Regional Planning

The SR-47 Expressway project is currently programmed in the 2004 RTIP and is included in the 2004 Regional Transportation Plan (RTP). The project is being updated to be included in the 2006 RTIP.

State Planning

The combined Long Beach and Los Angeles Port complex has experienced significant growth during recent decades, and is currently the largest port in the United States based on cargo volumes handled. As a result of the increased need to continuously distribute cargo to the mainland, the Schuyler Heim Bridge, Terminal Island, and the I-110 and I-710 Freeways have undergone increased truck traffic.

The SR-47 Expressway is envisioned as part of a series of regional transportation improvements at the southern end of the Alameda Corridor, in the vicinity of the ports. SR-47 is intended to provide improved transportation, circulation, and goods movement to and from the ports. The SR-47 Expressway is cited in the Southern California Association of Governments (SCAG)'s RTP. It would build on a network of local streets by constructing a high-capacity, dedicated, uninterrupted expressway linking the Ocean Boulevard interchange with Alameda Street.

Local Planning

The proposed SR-47 Expressway Project is consistent with the City of Long Beach and Los Angeles' plan to relieve congestion on surface streets. The proposed improvements to Henry Ford Avenue will comply with the Americans with Disabilities Act (ADA). There is no bicycle route within the project limits.

---

[1] Daily long trains (greater than 1000 feet) on the East and West Wilmington Wye tracks are approximately 10% and 6% respectively and is projected to increase 8% per year. The southbound New Dock Street off-ramp would also provide safe crossing over the Terminal Island Wye Track at Pier S.

[2] Assumed average of 1 minute gate downtime per train.

Project Alternatives

The following alternative project designs are examined in this traffic study:

Alternative 1: Proposed Project

The proposed project involves replacement of the Schuyler Heim Bridge and construction of a limited access expressway that connects to the bridge, extends northward a distance of approximately 2.7 kilometers (km) (1.5 miles) and an elevated flyover connecting eastbound Ocean Boulevard traffic to northbound SR-47 as shown in Exhibit 1. The project is located along State Route 47 (SR-47) (Alameda Corridor) within the City and Port of Long Beach, California, and Los Angeles, California. The proposed project would be located primarily in the community of Wilmington and the Port of Long Beach, with a portion of the project within the Port of Los Angeles. The project is located about 3.2 kilometers (km) (2 miles) east of Interstate-110 (I-110), approximately 1.6 km (1 mile) west of I-710, and approximately 4 km (2.5 miles) south of I-405.

The Schuyler Heim Bridge is located in the City of Long Beach, within the Port of Long Beach, on SR-47. The bridge crosses the Cerritos Channel in the Port of Long Beach. The bridge is part of SR-47, which serves both SR-47 and SR-103 that provides a freeway link between Ocean Boulevard (the primary east west route on Terminal Island) and areas directly north of Terminal Island.

Alternative 2: Terminal Island Freeway Extension

This alternative would extend SR-103 approximately 2.6 kilometers to the northwest on a four - lanes 3.6 m (12-foot) elevated viaduct with 3.0 m (10 feet) outside shoulders and 1.5 m (5 feet) insider shoulders to join Alameda Street between Sepulveda Boulevard and I-405 as shown in Exhibit 2. This alternative includes replacement of the Schuyler Heim Bridge, which would be the same as the Schuyler Heim Bridge Replacement as discussed in the Alternative 4 and an elevated flyover connecting eastbound Ocean Boulevard traffic to northbound SR-47. No improvements to SR-103 would occur until near its northern terminus at Sepulveda Boulevard and Willow Street. Starting approximately 1000 m (3,280 feet) south of its current northern terminus, SR-103 would extend to the northwest on an elevated viaduct to join Alameda Street between Sepulveda Boulevard and I-405. Widening and operational improvements would be made to the existing Alameda Street and SR-103 to accommodate the northerly and southerly end connections of the proposed alignment.

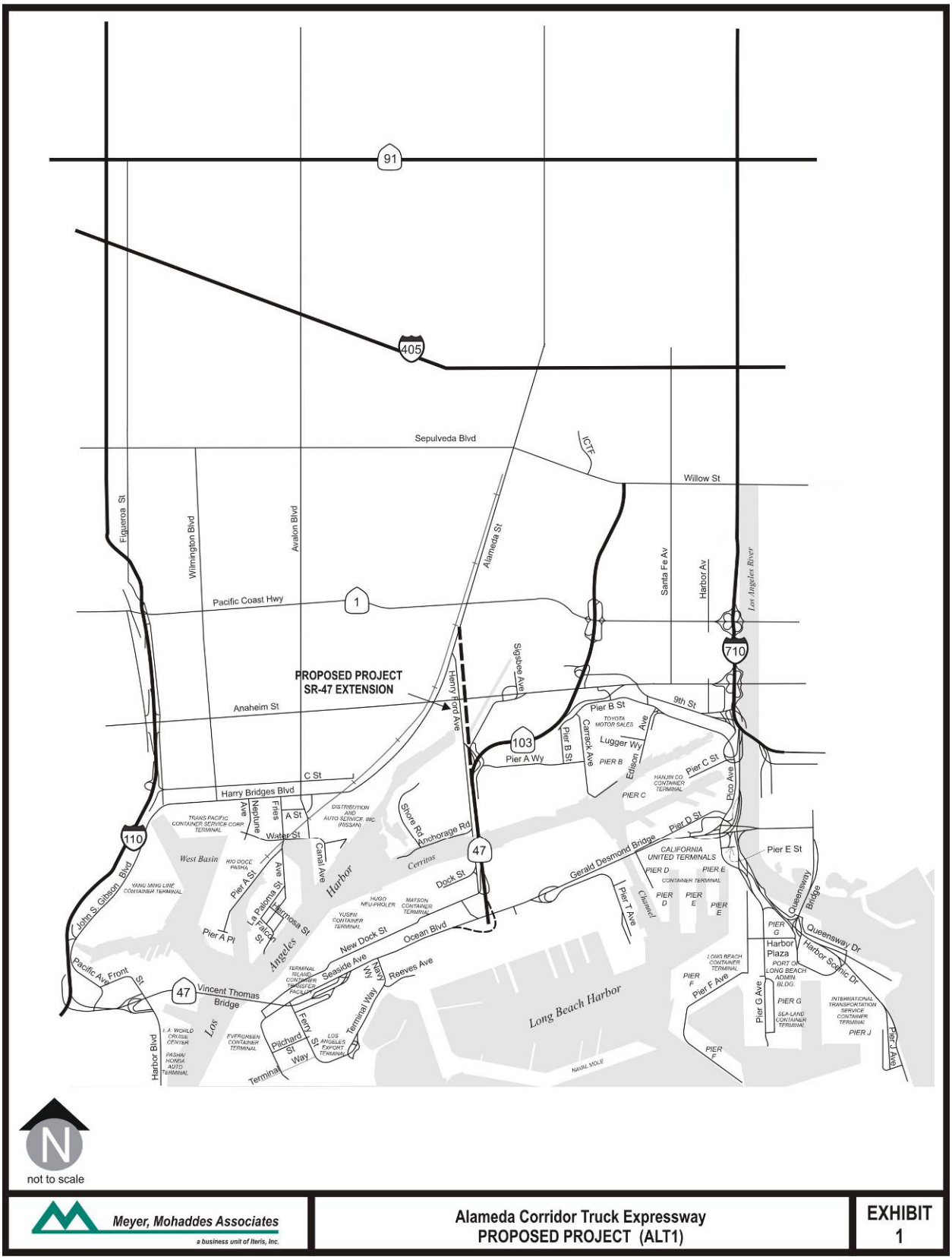
Alternative 3: Avoidance Alternative

In accordance with Section 106 of the National Historic Preservation Act, a Section 4(f) Evaluation is required for the Schuyler Heim Bridge because the existing bridge is eligible for listing on the National Register of Historic Places (NRHP) and, as such, is an historic structure. The project will utilize federal funds, and federal actions are necessary; therefore, Section 4(f) is triggered. The Schuyler Heim Bridge is the only Section 4(f) resource affected by the proposed Project.

This alternative would reduce impacts to a historical resource by preserving the existing Schuyler Heim Bridge and constructing a new fixed bridge on an alignment east of the existing bridge. The proposed alignment is primarily outside and east of the existing right-of-way. The replacement bridge would have the same lane configuration as the proposed project alternative. This alternative would include a southbound off-ramp and northbound on-ramp at New Dock Street on Terminal Island, as well as a northbound off-ramp and southbound on-ramp at Henry Ford Avenue on the mainland side of the bridge.

Alternative 4: Bridge Replacement Only

This alternative would replace the existing Schuyler Heim Bridge (lift bridge) with a fixed bridge largely along the existing alignment and shifted slightly to the east. This replacement bridge would be slightly wider than the existing bridge due to the addition of standard shoulders, which are not present on the existing bridge. The replacement bridge would include four 3.6-m (12 feet) lanes with 3m (10 feet) shoulders in the northbound direction and three 3.6-m (12 feet) lanes with 3m (10 feet) shoulders lanes in the southbound direction. Although the proposed alignment for the replacement is located primarily within the existing bridge right-of-way, the footprint is wider toward the east to avoid impacts on the railroad located on Badger Bridge, immediately to the west.



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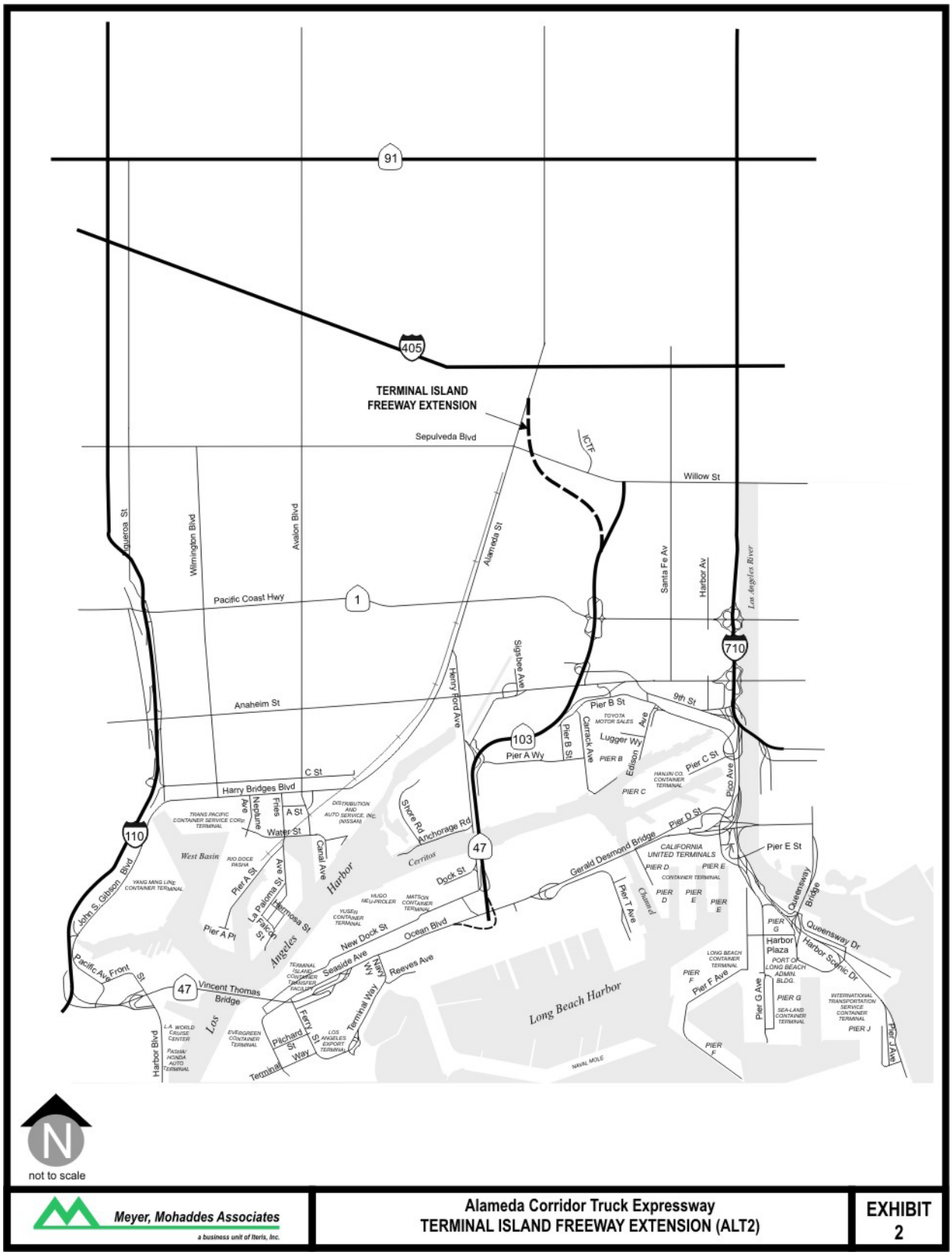
Alameda Corridor Truck Expressway
PROPOSED PROJECT (ALT1)

EXHIBIT 1



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Alameda Corridor Truck Expressway
TERMINAL ISLAND FREEWAY EXTENSION (ALT2)

EXHIBIT 2

Alternative 5: Transportation System Management (TSM) Alternative

This Transportation Systems Management (TSM) alternative would include measures to improve capacity and traffic circulation at the Port of Long Beach and Port of Los Angeles through policy changes and use of the latest technologies in TSM and transportation demand management (TDM). These TSM/ TDM measures could include minor intersection improvements, installing Intelligent Transportation Systems (ITS), adjusting operational policies at the ports, and facilitating ride sharing and transit. The goal would be to improve traffic and circulation through policy changes and use of TSM/ TDM policies. With this alternative, capital investment would be minimal compared to the previous alternatives addressed.

Alternative 6: No Build

Under the No Project/No Build Alternative, replacement of the Schuyler Heim Bridge and construction of the SR-47 Expressway would not occur. The existing Schuyler Heim Bridge would not be upgraded or seismically retrofitted, and no elevated expressway would be constructed.

Study Area

For purposes of this analysis, the study area includes the SR-47 Expressway mainline, ramps, and intersections in the immediate vicinity of the project, and intersections north and south of the project. Intersections analyzed as part of this study include the following:

- SR-47/Ocean Boulevard Interchange (future configuration)
- SR-47/New Dock Street On-ramp (unsignalized)
- SR-47/New Dock Street Off-ramp (unsignalized)
- SR-47/Henry Ford Avenue ramps (unsignalized existing and signalized in future)
- Henry Ford Avenue /Anaheim Street
- Henry Ford Ave/Denni Street
- Alameda Street/Anaheim Avenue
- Alameda St and PCH connector ramp n/o PCH
- PCH and Alameda St connector ramp e/o Alameda St
- Alameda St and Sepulveda Blvd connector ramp n/o Sepulveda Blvd
- Sepulveda Blvd and Alameda St connector ramp e/o Alameda St
- Alameda St and 223rd St connector ramp s/o 223rd
- 223rd St and Alameda St connector ramp e/o Alameda St
- 223rd Street/I-405 southbound ramps
- Alameda Street/I-405 northbound ramps
- Alameda St and Carson St connector ramp s/o Carson St
- Carson St and Alameda St connector ramp e/o Alameda St
- Alameda St and Del Amo Blvd connector ramp s/o Del Amo Blvd
- Del Amo Blvd and Alameda St connector ramp e/o Alameda St
- Alameda St and SR-91 eastbound ramps
- Alameda St and Artesia Blvd connector ramp n/o Artesia Blvd

Traffic Volume Development

New traffic counts were taken at all locations in 2004 for the AM, Mid-day and PM peak hours. All traffic volume counts include separate truck classification counts, separating auto and truck traffic to facilitate the application of Passenger Car Equivalent (PCE) factors to the truck volumes.

Year 2030 Traffic Volumes. - The travel demand forecasting (TDF) model used for the SR-47 Expressway traffic is based on the Ports of Long Beach and Los Angeles Transportation Study model, which was developed in 2001 and was approved by Ports of Long Beach and Los Angeles for Port area Transportation Planning Studies and environmental studies and is based upon the regional model of Southern California Association of Governments. The model has been updated in 2004 for the analysis of the Schuyler Heim Bridge replacement and SR-47 Expressway project, as well as for other ongoing port area transportation planning studies. The 2004 update includes incorporation of the most current regional model data as well as the most current port data. The original model was completed in 2000, and is based on the Southern California Association of Governments' (SCAG) Regional Travel Demand Forecasting Model. For the purpose of this study, the Port model was updated to the latest SCAG regional model methodology and assumptions used for the 2004 Region Transportation Plan (RTP). The model was calibrated as part of the Joint Port Study. Details on the model development and calibration are provided in the "Ports of Long Beach and Los Angeles Transportation Study". TRANPLAN is the software platform used for modeling and special model features include the following:

> *Grades and Passenger Car Equivalents* - An important feature of the model, which was explicitly accounted for and coded to the network, are locations of steep uphill and downhill grades. Grades are coded in the TRANPLAN network as they are in the field, to an accuracy of one percent.
>
> *Implementation of Truck Passenger Car Equivalencies (PCEs)* - The presence of vehicles other than passenger cars in the traffic stream affects traffic flow in two ways: (1) these vehicles, which are much larger than passenger cars, occupy more roadway space (and capacity) than individual passenger cars, (2) the operational capabilities of these vehicles, including acceleration, deceleration and maintenance of speed, are generally inferior to passenger cars and result in formation of large gaps in the traffic stream that reduce the highway capacity. On long, sustained grades, and segments with impaired capacities, where trucks operate considerably slower, formation of these large gaps can have a profound impact on the traffic stream.
>
> The TRANPLAN model uses an Equilibrium Traffic Assignment method, which uses a PCE table for converting trucks to equivalent passenger cars. The PCE factors are the same as those used for in the Southern California Heavy Duty Truck (HDT) Model. They include a sliding scale of PCE factors that takes into account the grade, the length of grade and the percent truck traffic.

For the LOS analysis, the forecast truck traffic volumes generated from the TRANPLAN model are converted to passenger car equivalent by applying the following PCEs:

- A PCE factor of 1.1 was applied to tractors (bobtails) truck volumes,
- A PCE factor of 2.0 was applied to chassis truck volumes,
- A PCE factor of 2.0 was applied to the container truck volumes

These factors are consistent with factors applied in previous port studies include the Ports of Los Angeles/Long Beach Transportation Study, as well as all recent environmental studies in the port area.

2030 Trip Tables - The 2030 trip tables were developed in two parts: 1) Port trips and 2) Regional trips. The port model zone trip tables were developed based on a detailed port area zone system and specialized trip generation rates for autos and trucks in the Port. Special trip generation rates for autos were developed for the Port studies and applied to the most current 2030 port forecasts. Port cargo throughout is measured in terms of "Twenty Foot Equivalent Units" (TEU). Truck trip generation for container terminals was developed using the "Quicktrip" model as explained later in this section.

The Quicktrip model is well documented in prior Port's transportation studies. It is a spreadsheet approach to truck trip generation analysis that was developed as a collaborative effort between the staff of both Ports and a team of consultants. The model builds upon a gate trip generation model that was previously developed, with considerable refinements. It includes detailed input variables such as mode split (rail versus truck moves), time of day factoring, weekend moves, empty return factors and other characteristics that affect the numbers of trucks through the gates. The end product is a forecast of truck trip generation, by type of truck trip, for each hour of the day, by direction. The on-dock rail mode split will vary terminal by terminal base on each terminal's rail capacity. For the POLB the average on-dock rail mode share is 24% for the POLA it is 29%

The Port area peak hour auto, bobtail, chassis and container trip tables were generated based on the forecast 2030 twenty-foot equivalent units (TEU) using the Quick Trip model. The total estimated TEU throughput for 2030 is approximately 44.7 million TEU. For the peak month, this equates to 4.1 million TEU. As a comparison, current (year 2003) total ports TEU throughput was 11.8 million. Truck trips are classified into bobtail, chassis and container truck trips, representing the major types of truck trips in the ports. The forecast 2030 trip generation totals for container terminals at both Ports (container terminals account for approximately 90 percent of port truck trips) are as follows:

- AM peak hour – 3,960 autos, 8,280 trucks, 12,240 total vehicles
- Mid-day peak hour – 1,980 autos, 10,430 trucks, 12,410 total vehicles
- PM peak hour – 5,400 autos, 6,890 trucks, 12,290 total vehicles

The 2030 AM, Mid-day, PM peak hour regional trip tables were developed using the SCAG 2030 trip tables. SCAG AM, Mid-day and PM time period trip tables were divided by 0.38, 0.25 and 0.27, respectively to develop peak hour trip tables from the period trip tables. The peak hour factors were developed as part of the Ports of Long Beach and Los Angeles Transportation Study model calibration and validation. The resulting model includes unique hourly trip tables, which match the peak hour trip generation estimates that were developed for the Port zones. The hours for which trip tables have been developed include 8 to 9 AM, 2 to 3 PM, and 4 to 5 PM, representing the Port AM peak hour, mid-day peak hour and PM peak hour.

Traffic Assignment - Equilibrium type multi-class assignments are used for the peak hour traffic assignments.

In summary, the following lists the key specifications/elements for the 2030 traffic model:

- Model produces Year 2030 AM, MD and PM peak hour forecast traffic volumes.
- Model contains specialized trip tables for the Ports area, which replaced the SCAG model Port trips in the port area.
- Model includes the 2004 RTP auto and Heavy-Duty Truck (HDT) trip tables for 2030.
- Model includes detailed roadway network (to the local street level) in the port area, and the SCAG regional model network outside of the port area.

For the purpose of this study, street capacity for Henry Ford Avenue south of Alameda Street was reduced by one third to reflect the delays due to the five at-grade railroad crossings. In consultation with Caltrans, no improvement was assumed for I-710 or Gerald Desmond Bridge. The above assumptions were incorporated in all modeling scenarios.

The 2030 turning movements at intersections were developed using the "Iterative" methodology as described in the "National Cooperative Highway Research Program Report (NCHRP) 255: Highway Traffic Data for Urbanized Area Project Planning and Design," Chapter 8. The method uses the base year turning percentages (from traffic counts) and proceeds through an iterative computational technique to produce a final set of future year turning volumes based on the forecast approach and departure traffic volumes. The future traffic volumes are developed by adding the difference in the traffic volume between the future model and base model to the base year counts for each corresponding approach and departure volume.

This methodology was chosen due to the fact that the model turning movements for a forecast year of 2030 are not appropriate for use directly in capacity analyses at most study locations. Also, the model was calibrated to the link and screenline level, but it was not fully validated to the turning movement level at many of the study intersections (it is a sub-regional model and was not calibrated in detail north of I-405); therefore, use of direct model output at the turning movement level would be misleading. The exception to this methodology is the interchange of SR-47 and Ocean Boulevard as well as New-Dock Street On/Off ramps, where the model turning movements were used as opposed to applying the NCHRP 255 method since the future

intersection configuration at these locations are significantly different from the existing conditions.

Alternatives 3, 4 and 5 traffic results are not sensitive to the types of alternatives being considered. That is, these alternatives would not affect traffic forecasts or analysis results. Therefore, only a single Schuyler Heim Bridge configuration is included in the analysis. It would consist of a replacement bridge with 3 lanes in each direction and full shoulders.

Analysis Methodologies

This study evaluates the existing and forecast year 2030 conditions within the study area for each of the proposed alternatives. The following operational studies were analyzed in this report for existing and forecast year 2030 conditions:

- SR-47 Expressway mainline weaving analysis for year 2030 –
- Mainline operations analysis (using HCM methodology) on SR-47, I-110, I-710 and SR-103
- Intersection levels of service (using Critical Movement/Circular 212 methodology and Highway Capacity Manual methodology)
- Arterial operations and weaving analysis of the section of Alameda Street at and north of the point where the new Expressway meets the existing roadway system (using micro-simulation analysis)

SR-47 Expressway Weaving Analysis. During the project scooping process, the consensus was reached that the available models/methodology (Highway Capacity Manual) for conducting the freeway weaving analysis have some justifiable limitations. The corridor is a truck expressway and therefore carries a truck volume far greater than the customary ratios for a freeway (75 percent trucks to 25 percent passenger cars). Therefore the mid-day peak hour weaving volumes, which represent the worst case scenario along the Expressway mainline weaving section, were analyzed using the CORSIM software. The CORSIM model was developed for the Schuyler Heim Bridge which extends from Ocean Boulevard to SR-103/SR-47 split.

Using the Ports TDF model, multiple select link analyses were conducted to identify auto and truck traffic movements on the Schuyler Heim Bridge and develop an Origin-Destination (O-D) trip table for CORSIM model. The forecast traffic turn volumes from TDF volumes were also used to develop the optimized signal timing for input to CORSIM model for the two intersections of the SR-47 and Ocean Boulevard using Synchro. The CORSIM model results provided the necessary information for weaving analysis.

Mainline Analysis. Peak hour mainline analysis for SR-47, SR-103, I-710 and I-110 were conducted using the Highway Capacity Manual methodologies. Input variables include the forecast peak hour volumes, free flow speed, geometric conditions (number of lanes, lane width, shoulder lateral clearance, interchange density, driver population factor). This analysis produces the peak hour mainline level of service. It is important to note that many of the analyzed freeway mainlines carry a high percentage of trucks. Since the Highway Capacity Software limits the truck percentage to 25 percent, truck volumes were converted to PCEs as input to HCM software and the truck percent was set to zero ($P_T = 0$). The resultant flow rate (V_P) based

on this approach was proven to be more conservative by comparing the results with applying the HCM methodology and allowing the truck percentage to be higher than 25%. The comparison is provided in the Appendix. The purpose of the mainline analysis is to determine if the ultimate Level of Service will meet standard guidelines. For a new facility the minimum acceptable level of service is generally considered to be LOS D or better.

Intersection Level of Service (LOS) Analysis. All currently signalized and planned signal locations were assessed using the Critical Movement Analysis (CMA) method (in conformance with City of Carson and City of Los Angeles guidelines) using the TRAFFIX software system. Unsignalized intersections were assessed using Highway Capacity Manual methodologies for unsignalized locations.

Interchange Operations Analysis. The future interchange of Ocean Boulevard/Henry Ford Avenue/SR-47 is assessed using the Synchro software model. Synchro is used due to the close spacing of the intersections under the future "split diamond configuration" of the interchange and the fact that neither CMA nor HCM accounts for the potential interaction of traffic between two closely spaced intersections such as in the interchange.

Arterial Operations. The section of Alameda Street from where the Expressway joins Alameda Street to north of the Pacific Coast Highway connector ramp intersection is analyzed using CORSIM micro-simulation model.

Existing Traffic Conditions

New intersection turning movement traffic counts were taken at all 20 study locations in 2004 for the AM, MD and PM peak hours. All traffic volume counts include separate truck classification counts, separating auto and truck traffic to facilitate the application of Passenger Car Equivalent (PCE) factors. Mainline freeway counts are obtained from Caltrans 2003 Count Book, as shown in Table 1. Existing SR-47 mainline and ramp volumes for the AM, MD and PM peak hours are shown in Exhibit 3. Existing turning movements at the study intersections are presented in Exhibits 4, 5 and 6 for the AM, MD and PM peak hours, respectively.

Table 1 - 2003 Traffic Volumes

Location	AADT/ Peak Hour
Interstate 110 – s/o PCH*	112,000 / 9,000
Interstate 710 – n/o PCH*	143,000 / 11,600
Interstate 710 – s/o PCH*	130,000 / 11,800
SR-103 – s/o PCH*	14,300 / 1,650
Henry Ford Ave – n/o Anaheim	AM Peak – 650 (46% truck) PM Peak – 720 (22% truck)
Alameda Street – SR 1 to I-405	AM Peak – 1,670 (30% truck) PM Peak – 1,980 (28% truck)
Alameda Corridor Truck Expressway - s/o SR 1	NA – future proposed facility

* Source: 2003 Caltrans Count Book

Expressway Weaving Analysis. - No Expressway weaving analysis is required for existing conditions as there will only be a weaving section with future scenarios.

Expressway Mainline Analysis. - Not required for existing conditions.

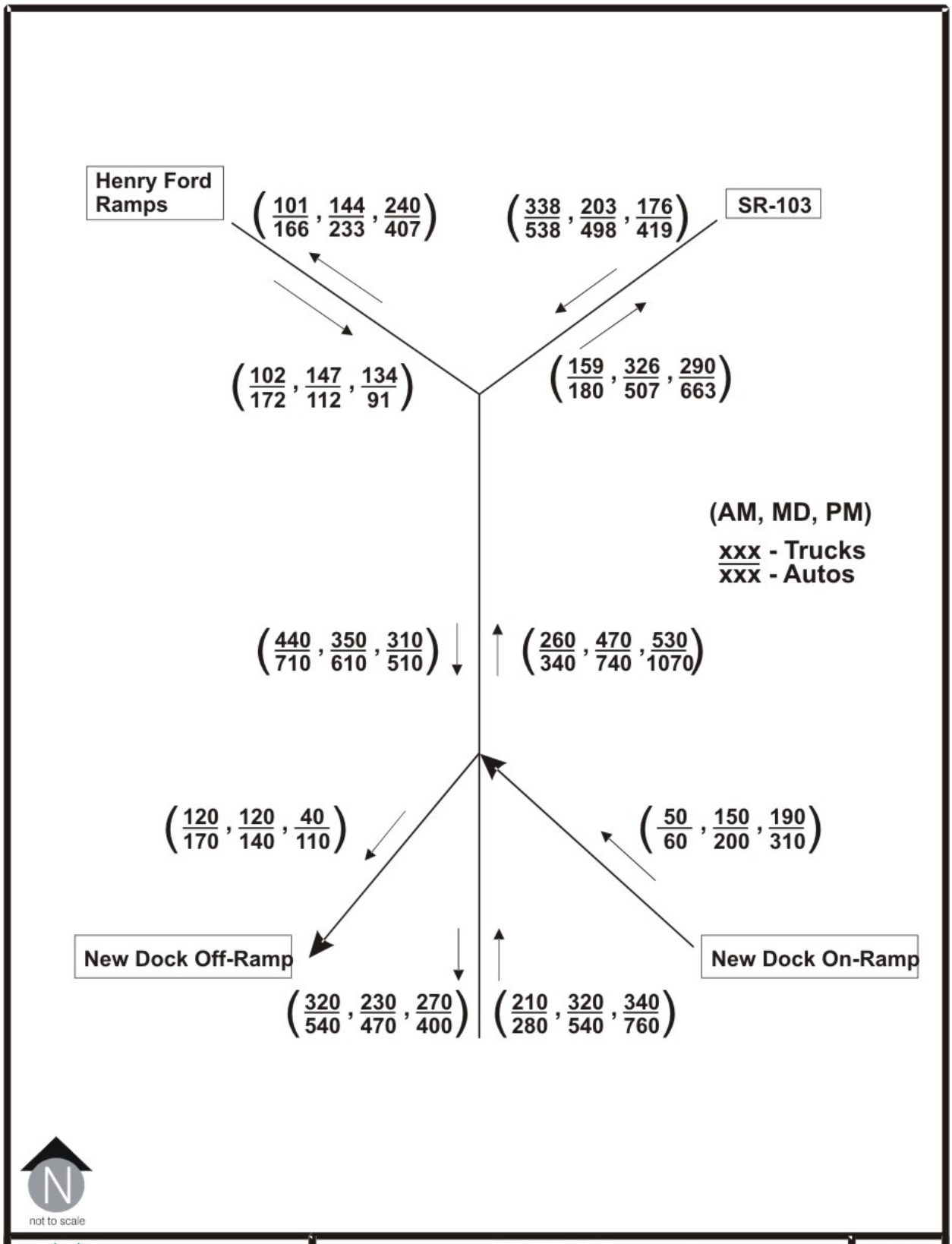
Intersection Levels of Service. - Study intersections fall with the jurisdiction of the City of Long Beach, the City of Los Angeles and the City of Carson. The cities of Long Beach and Carson consider level of service D to be the minimum acceptable level of service. In those cities, a significant impact is considered to be a project-related change in volume/capacity ratio of 0.02 or greater, where the resulting "with-project" level of service is E or F. In the City of Los Angeles, LOS D is also the minimum acceptable threshold for level of service; however, the City has a sliding scale of acceptable impacts for service levels C, D, E and F. For example, a greater impact is allowed under LOS C than LOS D before an impact is considered significant.

Due to the multiple significance thresholds, a regional standard approach is used, which matches both the cities of Carson and Long Beach and is also generally consistent with Los Angeles. For purposes of this analysis, a significant project impact is considered to be a project-generated change in volume/capacity ratio of 0.02 or greater, with a final LOS of E or F.

Table 2 summarizes the existing AM, Midday, and PM peak hour intersection operating conditions in terms of volume/capacity ratio and levels of service at the intersections in the study area. For unsignalized intersections, the analysis results are reported in terms of average vehicle delay. As indicated by the data in the table, all study locations currently operate at LOS D or better. Three locations currently operate at LOS D, while the remainder are at LOS C or better. The three locations currently at LOS D are as follows:

- Henry Ford Ave and Anaheim St. (PM peak hour)
- Sepulveda Blvd./Alameda St. connector ramp s/o Alameda St (PM peak hour)
- Alameda St/SR-91 EB ramps (PM peak hour)

The existing turn volumes and levels of service calculation sheets are provided in the Appendix.



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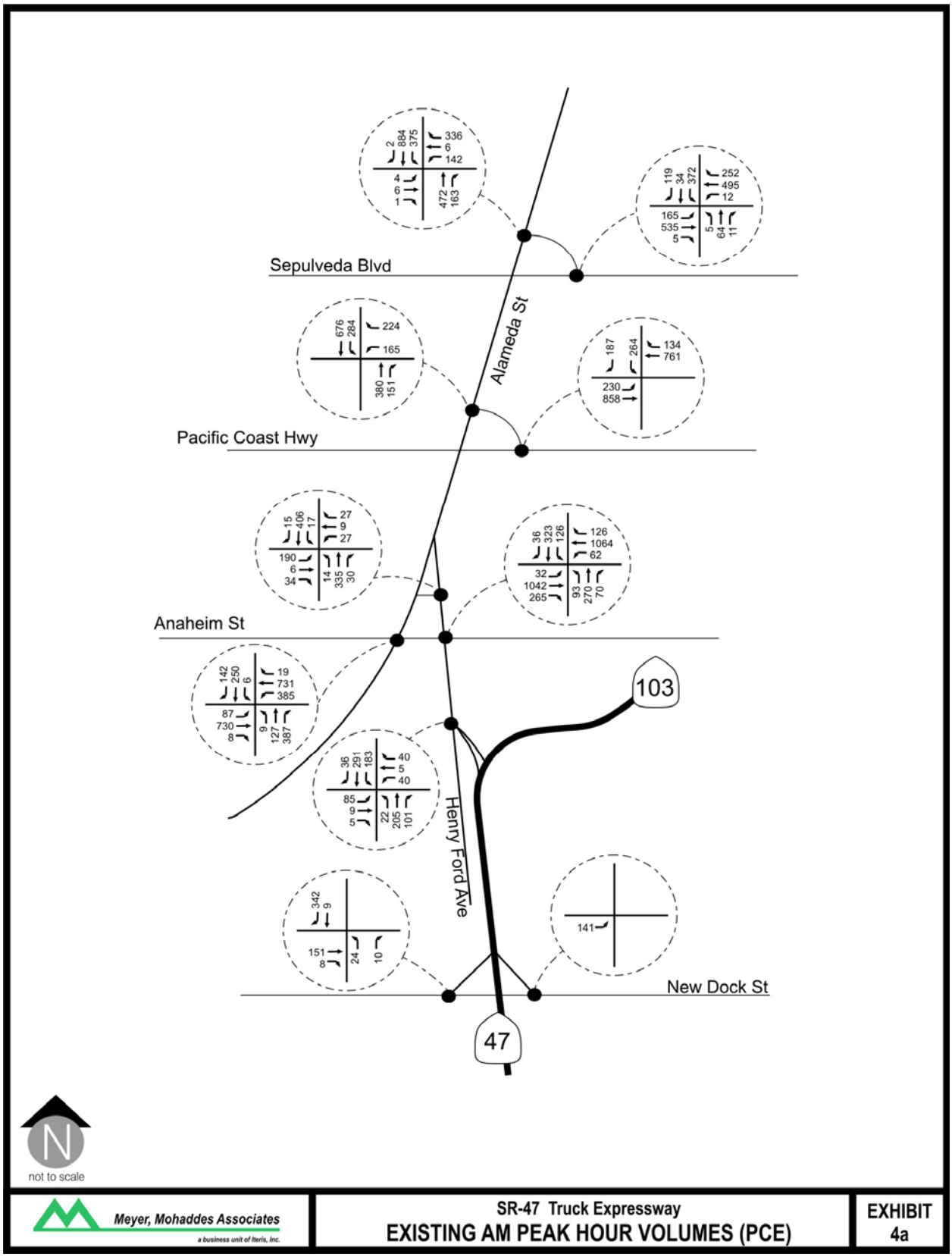
SR-47 Truck Expressway
EXISTING - SR-47 MAINLINE & RAMP VOLUMES

EXHIBIT 3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Anaheim St
New Dock St
Alameda St
Henry Ford Ave
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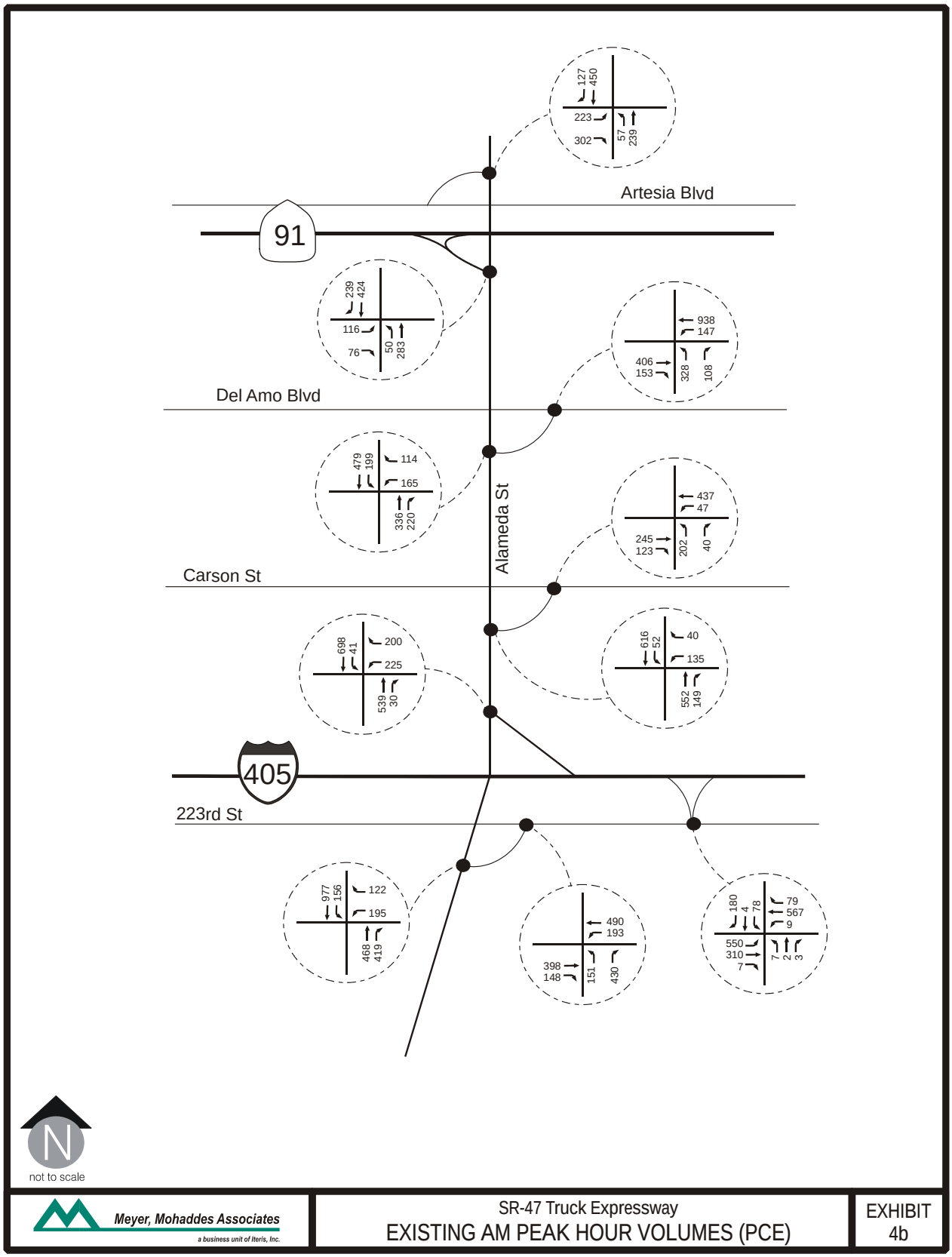
SR-47 Truck Expressway
EXISTING AM PEAK HOUR VOLUMES (PCE)
EXHIBIT
4a



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SR-47 Truck Expressway
EXISTING AM PEAK HOUR VOLUMES (PCE)

EXHIBIT
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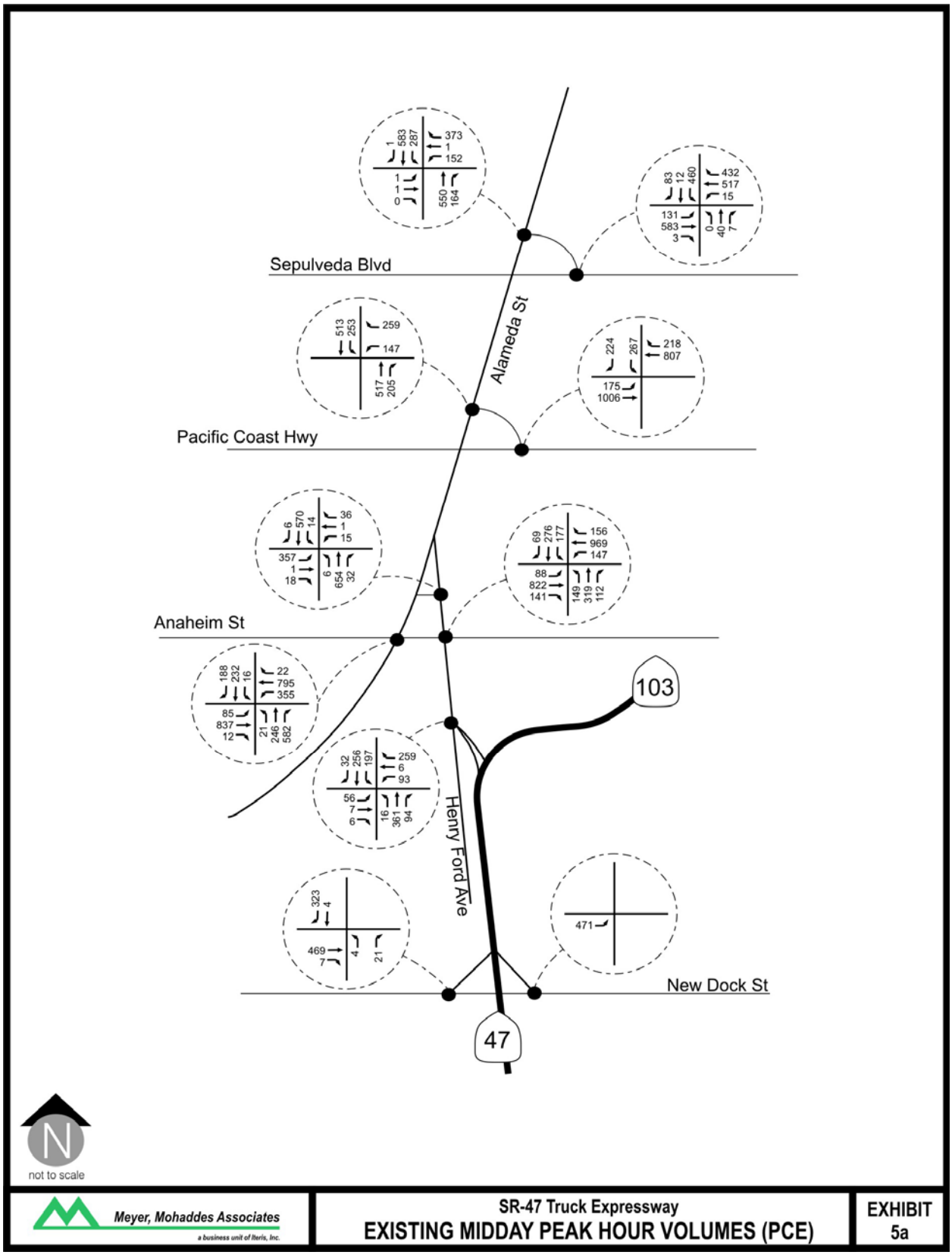
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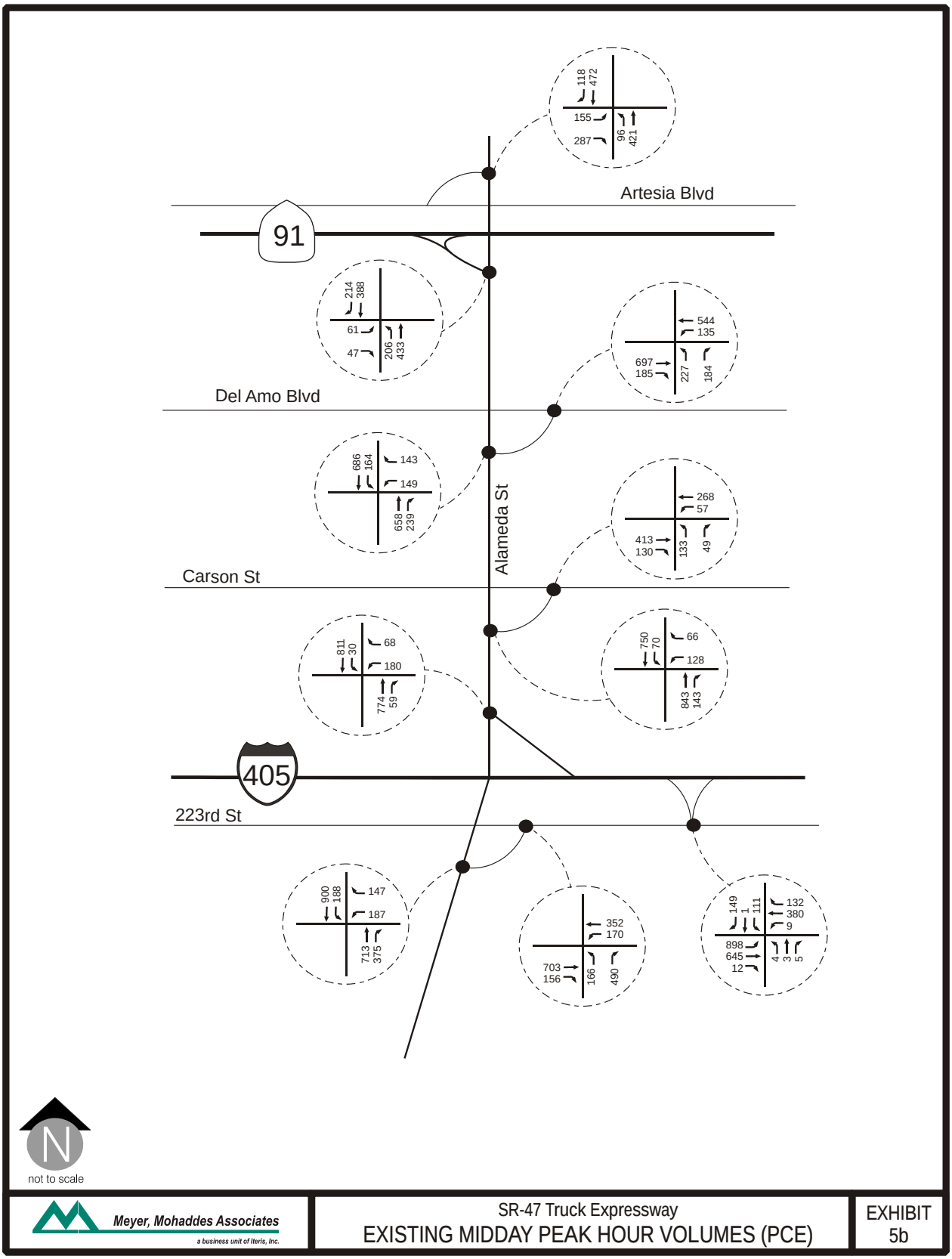
SR-47 Truck Expressway
EXISTING MIDDAY PEAK HOUR VOLUMES (PCE)
EXHIBIT
5a



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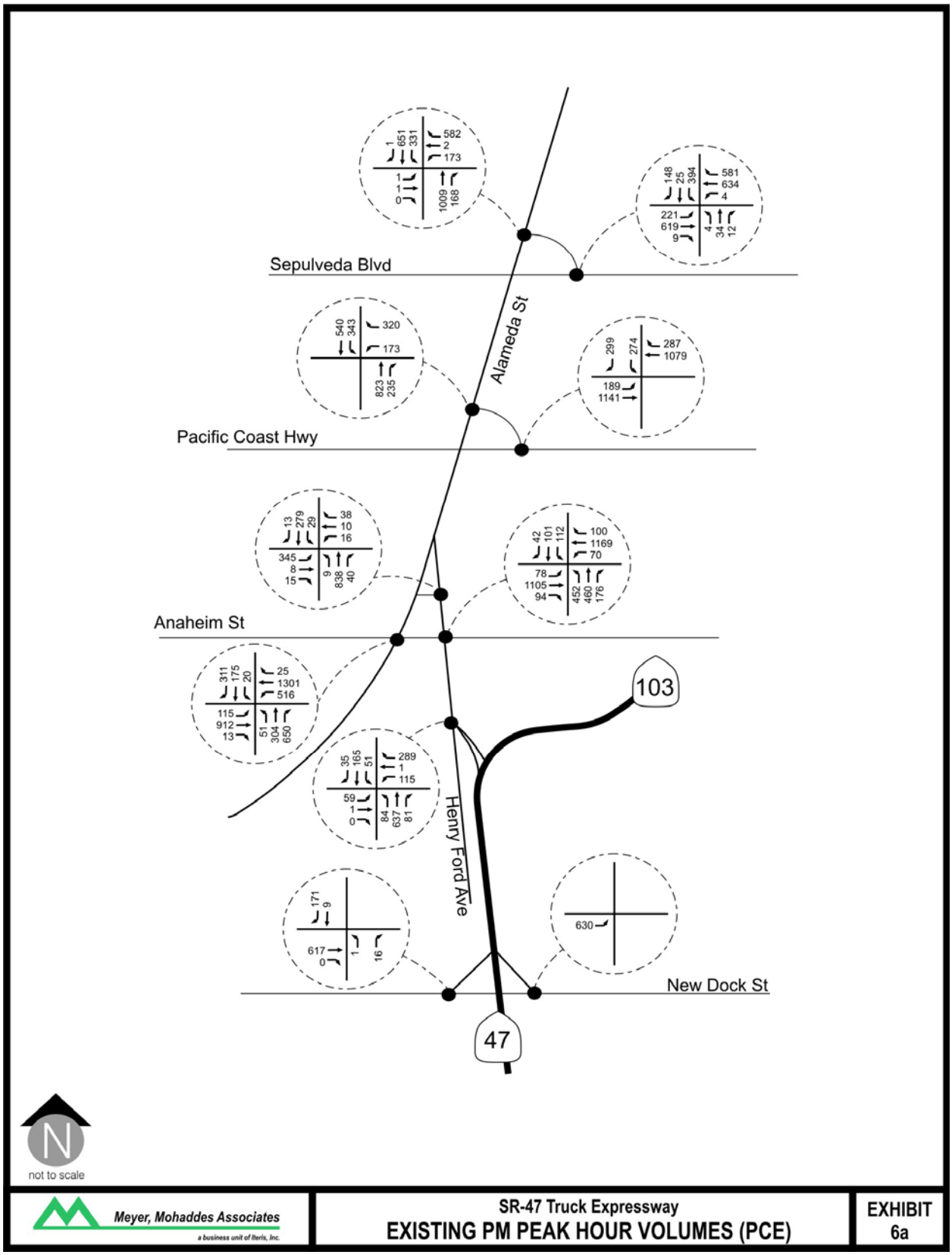
SR-47 Truck Expressway
EXISTING MIDDAY PEAK HOUR VOLUMES (PCE)

EXHIBIT 5b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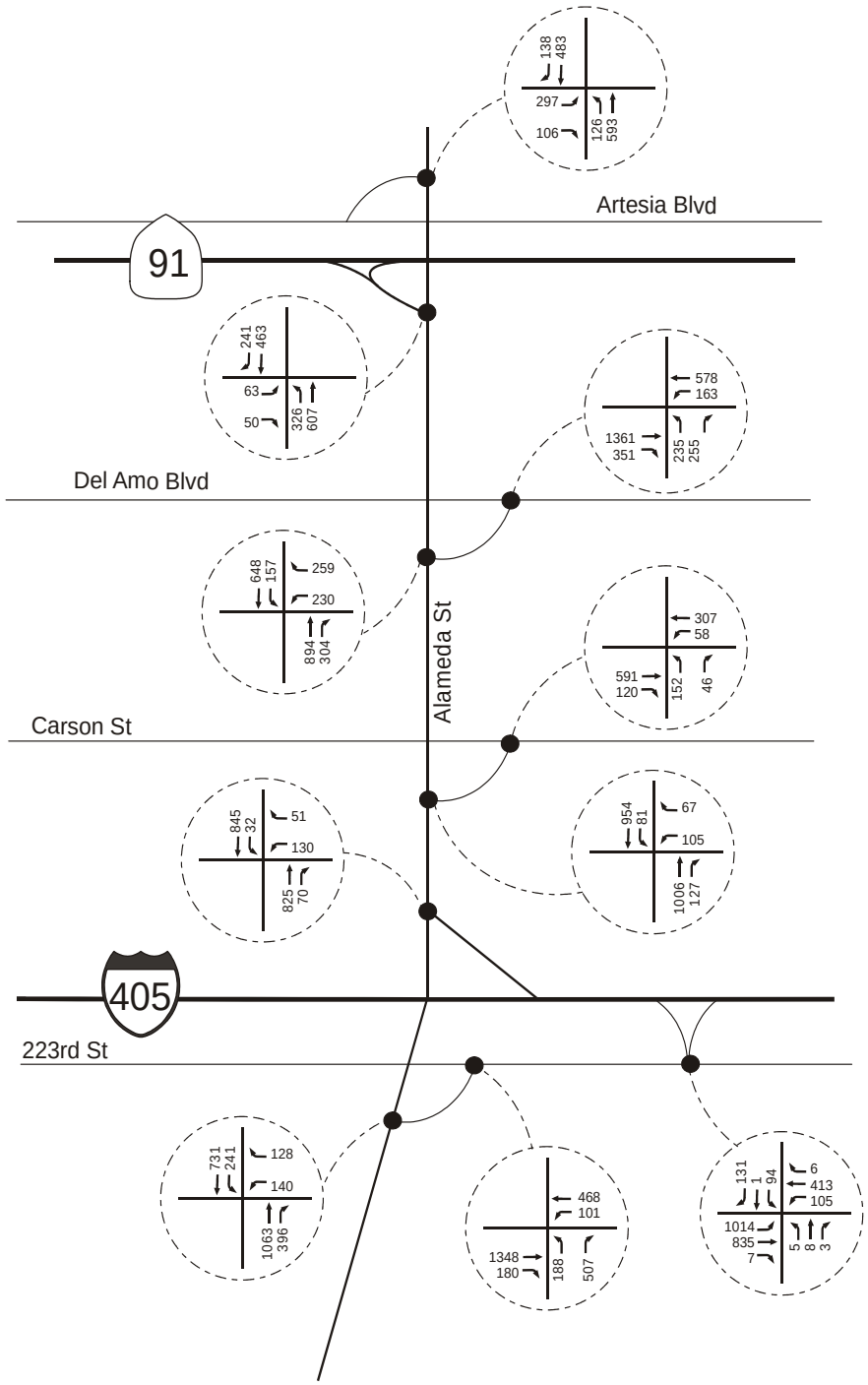
SR-47 Truck Expressway
EXISTING PM PEAK HOUR VOLUMES (PCE)
EXHIBIT
6a



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SR-47 Truck Expressway
EXISTING PM PEAK HOUR VOLUMES (PCE)

EXHIBIT
6b

Table 2 - Existing Intersection Operating Conditions (PCE)

Intersection	AM		MD		PM	
	Volume / Capacity or Delay	LOS	Volume / Capacity or Delay	LOS	Volume / Capacity or Delay	LOS
SR-47 & New Dock SB Off-Ramp[1]	11.1	B	10.8	B	10.7	B
SR-47 & New Dock NB On-Ramp[2]	8.3	A	10.2	B	11.6	B
SR-47 & Henry Ford Ramps[1]	10.1	B	11.2	B	12.9	B
Henry Ford Ave & Anaheim St	0.579	A	0.639	B	0.767	C
Henry Ford Ave & Denni St	0.347	A	0.531	A	0.605	B
Alameda St & Anaheim St	0.535	A	0.718	C	0.818	D
Alameda St / PCH Connector Ramp n/o PCH	0.462	A	0.503	A	0.658	B
PCH / Alameda St Connector Ramp e/o Alameda St	0.556	A	0.55	A	0.644	B
Alameda St / Sepulveda Blvd Connector Ramp n/o Sepulveda	0.536	A	0.49	A	0.69	B
Sepulveda Blvd / Alameda St Connector Ramp e/o Alameda St	0.699	B	0.694	B	0.825	D
Alameda St / 223rd St Connector Ramp s/o 223rd St	0.54	A	0.526	A	0.618	B
223rd St / Alameda St Connector Ramp e/o Alameda St	0.441	A	0.591	A	0.836	D
223rd St & I-405 SB Ramps	0.497	A	0.574	A	0.616	B
Alameda St & I-405 NB Ramps	0.32	A	0.342	A	0.324	A
Alameda St / Carson St Connector Ramp s/o Carson St	0.24	A	0.313	A	0.348	A
Carson St / Alameda St Connector Ramp e/o Alameda St	0.304	A	0.324	A	0.397	A
Alameda St / Del Amo Blvd Connector Ramp s/o Del Amo	0.288	A	0.331	A	0.462	A
Del Amo Blvd / Alameda St Connector Ramp e/o Alameda St	0.346	A	0.345	A	0.523	A
Alameda St & SR-91 EB Ramps	0.216	A	0.266	A	0.381	A
Alameda St & Artesia Blvd n/o Artesia Blvd	0.284	A	0.344	A	0.373	A

1. Unsignalized intersection – analyzed using HCM delay based methodology.
2. Intersection currently does not function as standard intersection as there are no conflicting traffic movements until terminal is built-out.

YEAR 2030 BASE "WITHOUT PROJECT" CONDITIONS

Year 2030 base "without project" traffic forecasts were generated using the methodologies described above. SR-47 mainline and ramp volumes for the 2030 base AM, MD and PM peak hours are shown in Exhibit 7. Exhibits 8, 9 and 10 illustrate Year 2030 base year traffic volumes at study intersections, for the AM, MD and PM peak hours, respectively.

Expressway Weaving Analysis

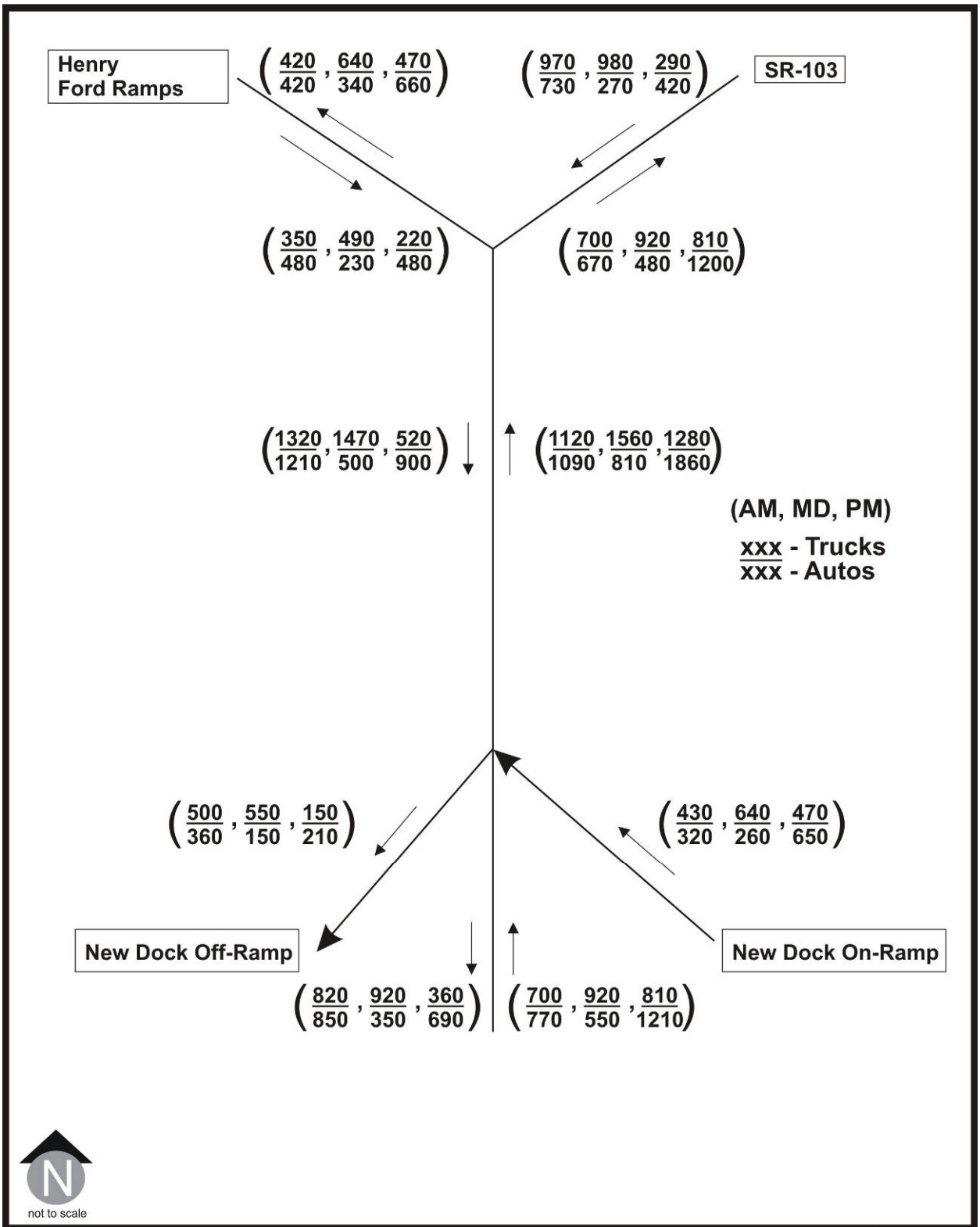
No Expressway weaving analysis is required for 2030 Base as there will only be a weaving section with Alternative 1.

Mainline Analysis

The results of mainline analysis are presented in Table 3. The results indicate that the mainline level of service is expected to be LOS E or better during all peak hours on SR 103 and I-110 (south of PCH). LOS on I-710 north and south of PCH is expected to be F in northbound and southbound directions during all of the peak hours. The appendix contains the level of service worksheets for the HCM analysis.

Table 3 - Year 2030 Mainline Level-of-Service (PCE)

Location	2030 Base					
	AM		MD		PM	
	Density	LOS	Density	LOS	Density	LOS
NB Alameda Corridor Truck Expressway - s/o SR 1	NA	NA	NA	NA	NA	NA
SB Alameda Corridor Truck Expressway – s/o SR 1	NA	NA	NA	NA	NA	NA
NB SR-103 – s/o PCH	22.7	C	25.7	C	31.1	D
SB SR-103 – s/o PCH	21.6	C	20.6	C	11.6	B
NB Interstate 710 – s/o PCH	> 45	F	>45	F	> 45	F
SB Interstate 710 – s/o PCH	> 45	F	>45	F	> 45	F
NB Interstate 710 – n/o PCH	> 45	F	>45	F	> 45	F
SB Interstate 710 – n/o PCH	> 45	F	>45	F	> 45	F
NB Interstate 110 – s/o PCH	35.2	E	32.0	D	29.1	D
SB Interstate 110 – s/o PCH	26.9	D	30.0	D	37.2	E



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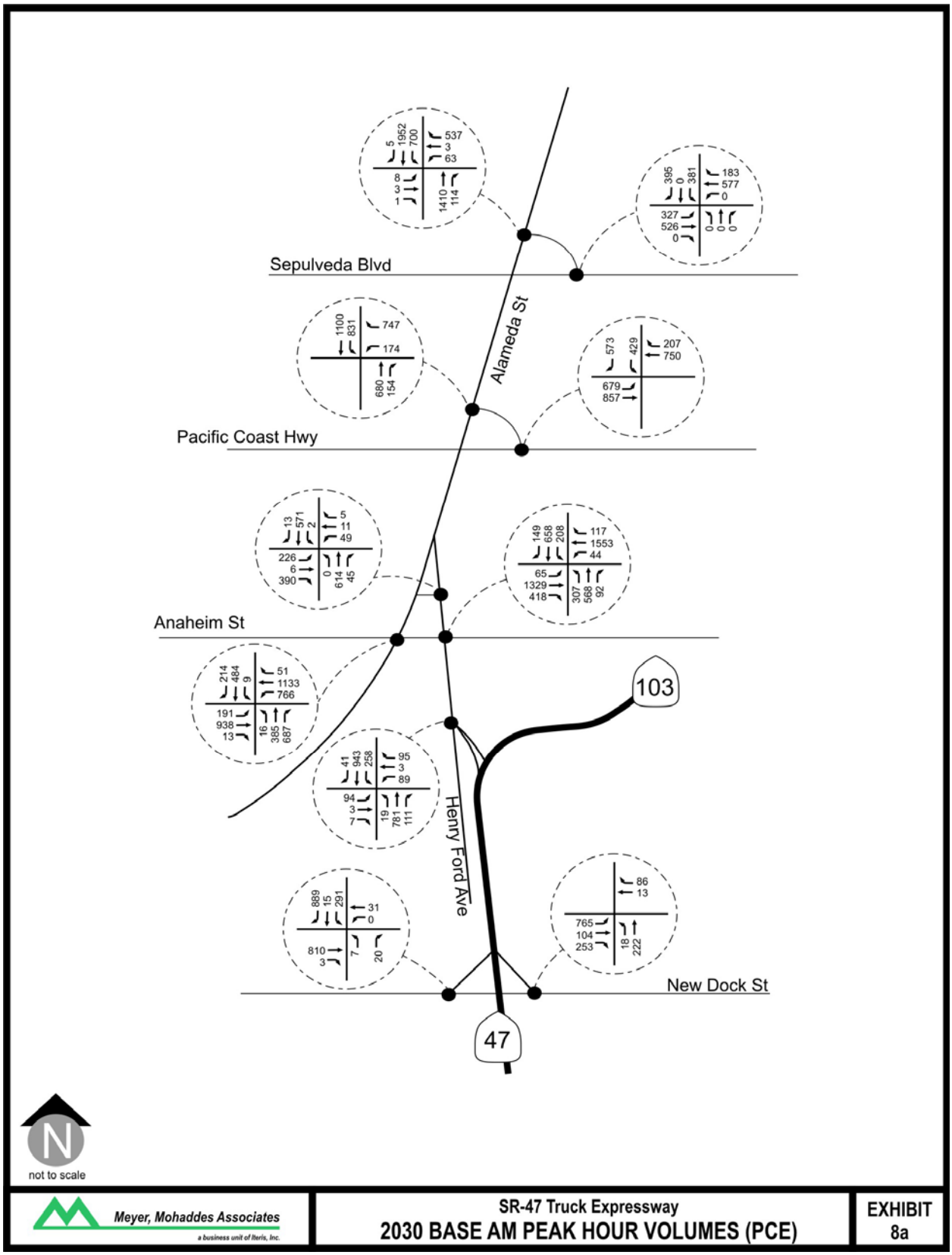
SR-47 Truck Expressway
2030 BASE - SR-47 MAINLINE & RAMP VOLUMES

EXHIBIT 7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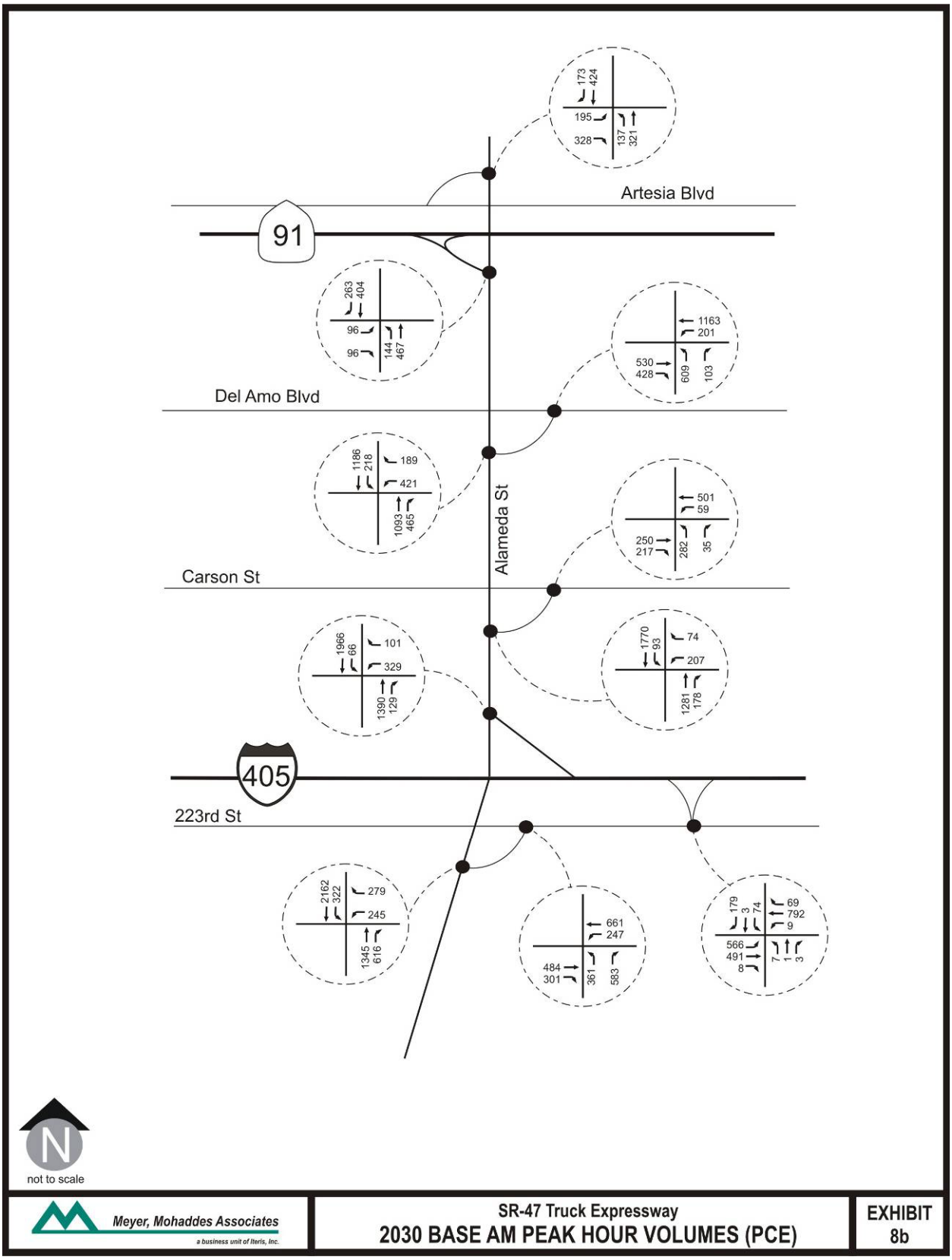
SR-47 Truck Expressway
2030 BASE AM PEAK HOUR VOLUMES (PCE)
EXHIBIT
8a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Del Amo Blvd
Alameda St
Carson St
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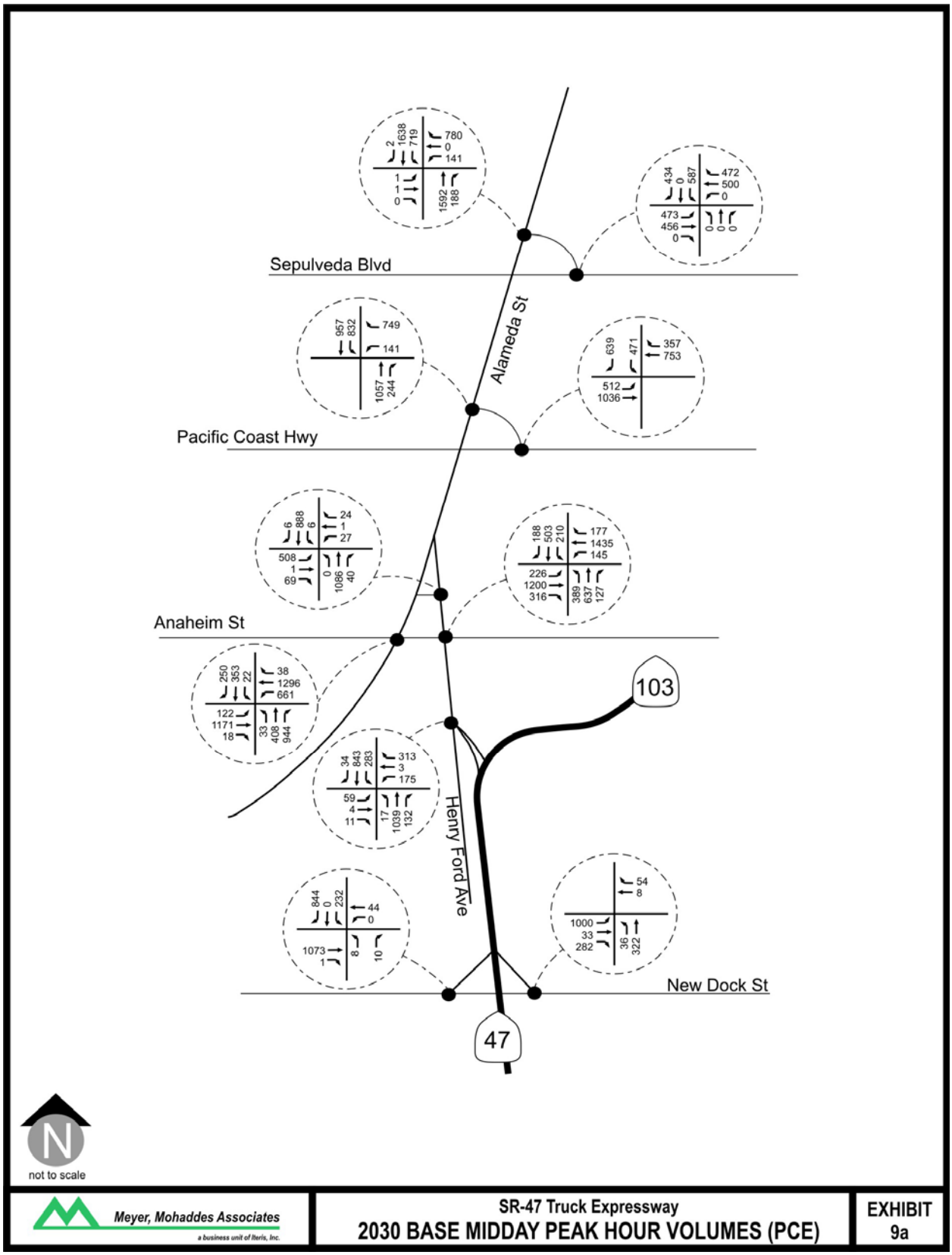
3
not to scale
Meyer, Mohaddes Associates
a business unit of Iteris, Inc.
SR-47 Truck Expressway
2030 BASE AM PEAK HOUR VOLUMES (PCE)
EXHIBIT
8b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Pacific Coast Hwy
Anaheim St
New Dock St
Alameda St
Henry Ford Ave
103
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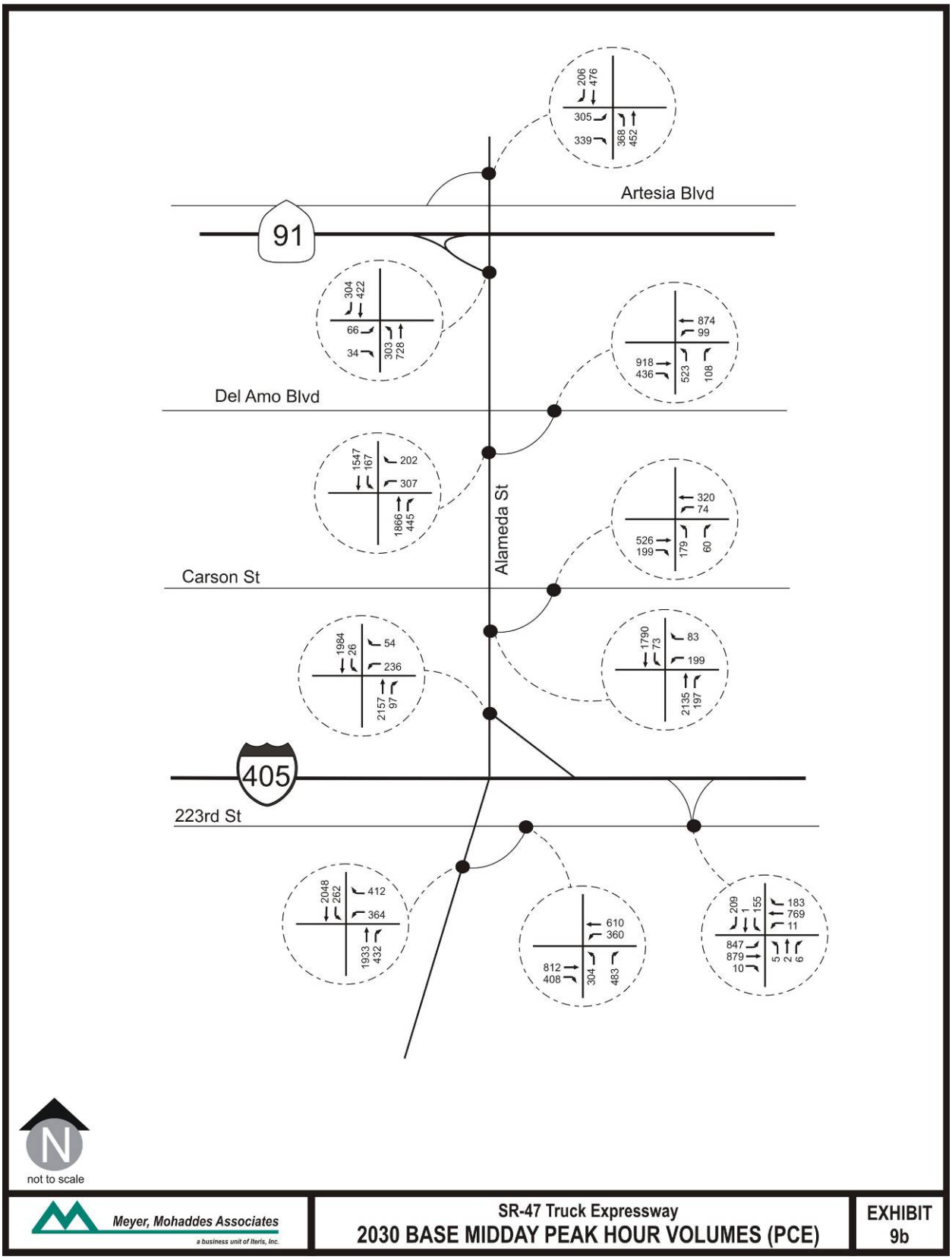
Meyer, Mohaddes Associates
a business unit of Iteris, Inc.
SR-47 Truck Expressway
2030 BASE MIDDAY PEAK HOUR VOLUMES (PCE)
EXHIBIT
9a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209
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183
769
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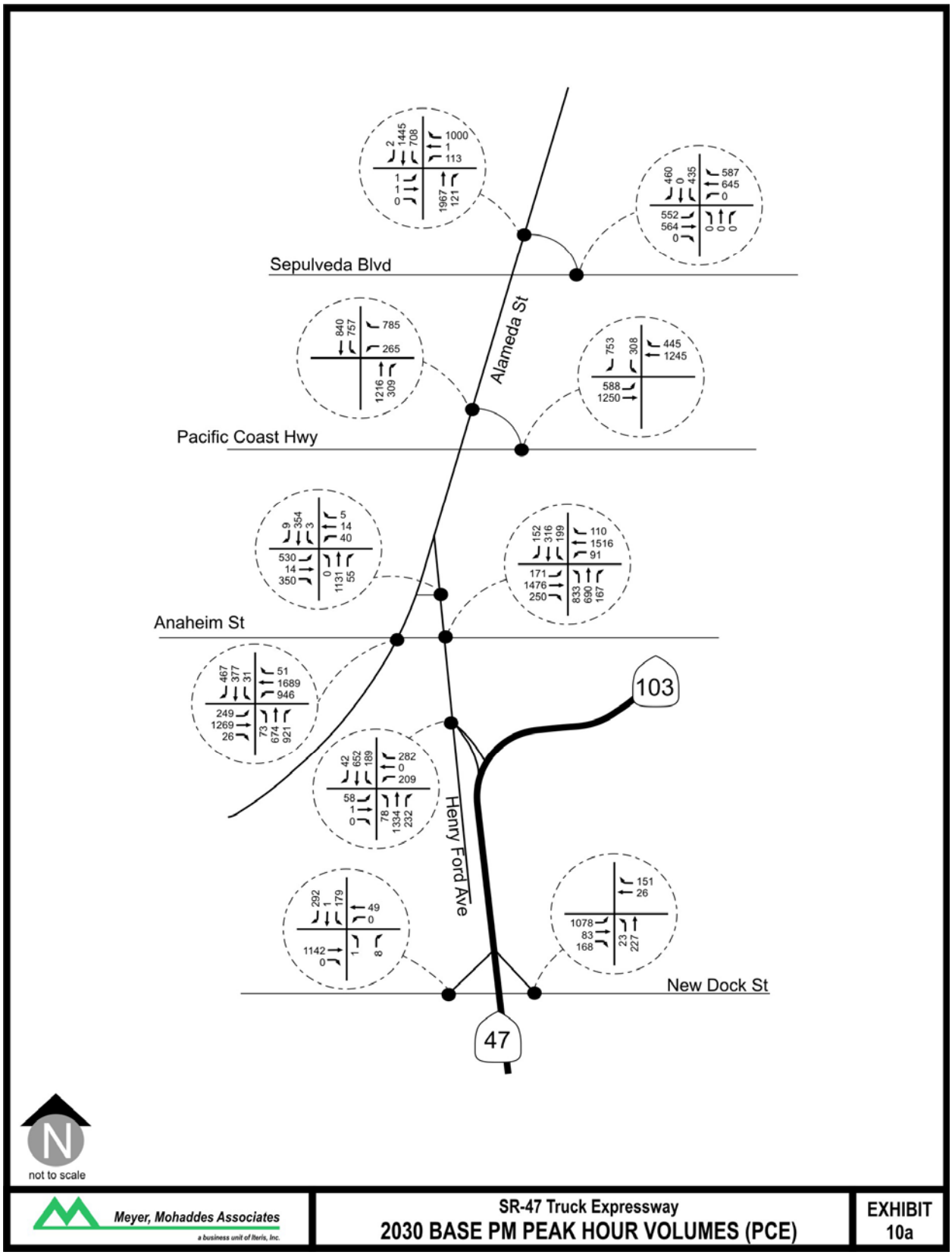
Meyer, Mohaddes Associates
a business unit of Iteris, Inc.
SR-47 Truck Expressway
2030 BASE MIDDAY PEAK HOUR VOLUMES (PCE)
EXHIBIT
9b



Meyer, Mohaddes Associates
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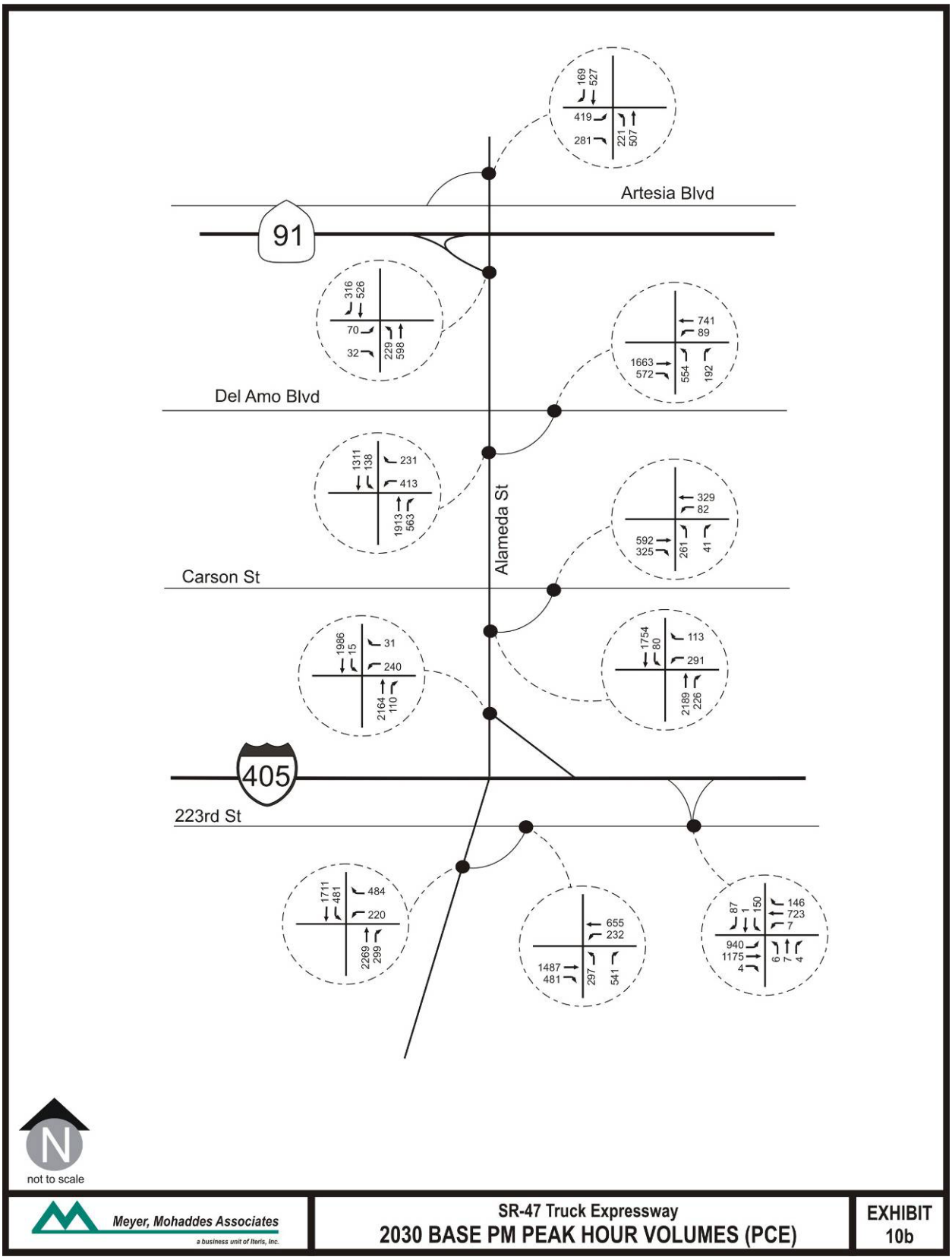
SR-47 Truck Expressway
2030 BASE PM PEAK HOUR VOLUMES (PCE)

EXHIBIT 10a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1487
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297
541
87
1
150
146
723
7
940
1175
4
6
7
4
not to scale
Meyer, Mohaddes Associates
a business unit of Iteris, Inc.
SR-47 Truck Expressway
2030 BASE PM PEAK HOUR VOLUMES (PCE)
EXHIBIT
10b

Intersection Levels of Service

Table 4 summarizes the 2030 Base AM, Mid-day and PM peak hour levels of service at the intersections in the study area. The levels of service calculation sheets are provided in the Appendix. As indicated, ten of the 20 study intersections are forecast to operate at LOS E or F during one or more peak hours in 2030 without the project.

Table 4 - 2030 Base Projected Intersection Conditions (PCE)

Intersection	AM		MD		PM	
	Volume / Capacity or Delay	LOS	Volume / Capacity or Delay	LOS	Volume / Capacity or Delay	LOS
SR-47 & New Dock SB Off-Ramp[1]	35.8	E	68.8	F	15.6	C
SR-47 & New Dock NB On-Ramp[1]	15.8	C	29.5	D	37.1	E
SR-47 & Henry Ford Ramps	31.4	D	75.5	F	139.6	F
Henry Ford Ave & Anaheim St	0.991	E	1.073	F	1.167	F
Henry Ford Ave & Denni St	0.54	A	0.778	C	0.812	D
Alameda St & Anaheim St	0.822	D	1.095	F	1.122	F
Alameda St / PCH Connector Ramp n/o PCH	1.266	F	1.357	F	1.367	F
PCH / Alameda St Connector Ramp e/o Alameda St	1.001	F	0.949	E	1.024	F
Alameda St / Sepulveda Blvd Connector Ramp n/o Sepulveda	1.011	F	1.16	F	1.296	F
Sepulveda Blvd / Alameda St Connector Ramp e/o Alameda St	0.781	C	0.909	E	1.008	F
Alameda St / 223rd St Connector Ramp s/o 223rd St	0.857	D	0.993	E	1.093	F
223rd St / Alameda St Connector Ramp e/o Alameda St	0.62	B	0.639	B	0.901	E
223rd St & I-405 SB Ramps	0.552	A	0.7	C	0.683	B
Alameda St & I-405 NB Ramps	0.691	B	0.711	C	0.711	C
Alameda St / Carson St Connector Ramp s/o Carson St	0.469	A	0.64	B	0.697	B
Carson St / Alameda St Connector Ramp e/o Alameda St	0.403	A	0.432	A	0.562	A
Alameda St / Del Amo Blvd Connector Ramp s/o Del Amo	0.611	B	0.724	C	0.792	C
Del Amo Blvd / Alameda St Connector Ramp e/o Alameda St	0.676	B	0.577	A	0.678	B
Alameda St & SR-91 EB Ramps	0.263	A	0.358	A	0.333	A
Alameda St & Artesia Blvd n/o Artesia Blvd	0.32	A	0.543	A	0.502	A

1. Unsignalized intersection – analyzed using HCM delay based methodology.

YEAR 2030 ALTERNATIVE 1 TRAFFIC CONDITIONS

Year 2030 traffic volumes with Alternative 1 which includes an elevated flyover connecting eastbound Ocean Boulevard traffic to northbound SR-47 for the roadways and intersections within the study area were developed using the methodology described in the "Traffic Volume Development" section above. The analysis of study area traffic operations for the Year 2030 Alternative 1 includes weaving and intersection analysis, as summarized below. Exhibits 11, 12, and 13 illustrate forecast link traffic volumes and changes in traffic flow due to the project as forecasted by the traffic model. As shown, the model predicts that the project would reduce port truck volumes on I-110 by up to five percent during the peak hours and I-710 by up to 10 percent. SR-47 mainline and ramp volumes for the 2030 Alternative 1 AM, MD and PM peak hours are shown in Exhibit 14. Exhibits 15, 16 and 17 illustrate traffic volumes at study intersections with Alternative 1, for the AM, MD and PM peak hours, respectively.

Weaving Analysis

The operation of SR-47 Expressway was modeled for the Mid-day peak hour condition which has the heaviest truck traffic on this corridor using the CORSIM software package. CORSIM is a comprehensive microscopic traffic simulation, applicable to surface streets, freeways, and integrated networks with a complete selection of control devices (i.e., stop/yield sign, traffic signals, and ramp metering). Roadway geometric information (number of lanes, freeway alignment, freeway grade, and ramp alignment) and traffic data (entry volumes, truck percentages, turning percentages, origin-destination patterns, signal timings) are used as input data. Using the output data from CORSIM simulation runs, the computed density of traffic along the freeway can be translated into level of service (LOS) grades based on the Highway Capacity Manual (HCM) methodology. The CORSIM traffic data inputs were developed as follows:

1. The 2030 origin-destination auto and truck traffic volumes for CORSIM model were obtained from the Ports TDF model. Multiple select link analyses were conducted to identify auto and truck traffic movements on the Schuyler Heim Bridge and develop an Origin-Destination (O-D) trip table.

2. A Synchro model was developed for generating signal timing and offsets at the intersection of the SR-47 and Ocean Boulevard for input to the CORSIM model. Synchro is a nationally accepted computer software package that provides system wide approach to traffic operation analysis. Synchro is widely used to provide solutions for optimizing signal timing, coordination, and capacity analysis. The program creates time-space diagrams, graphical timing plans and micro-simulation models.

Table 5 below summarizes the results of the Year 2030 Mid-day peak hour level of service for the weaving sections on the Expressway. The weaving sections are generally from the merge/diverge points north of the New Dock Street ramps to the area where SR-47 and SR-103 split. The results indicate LOS C or better conditions for Alternative 1. A more detail description of the CORSIM model is provided in the Appendix.

Table 5 - Alternative 1 Weaving Analysis - SR 47 between New Dock On- and Off-Ramps and the Diverge/Merge with SR 103

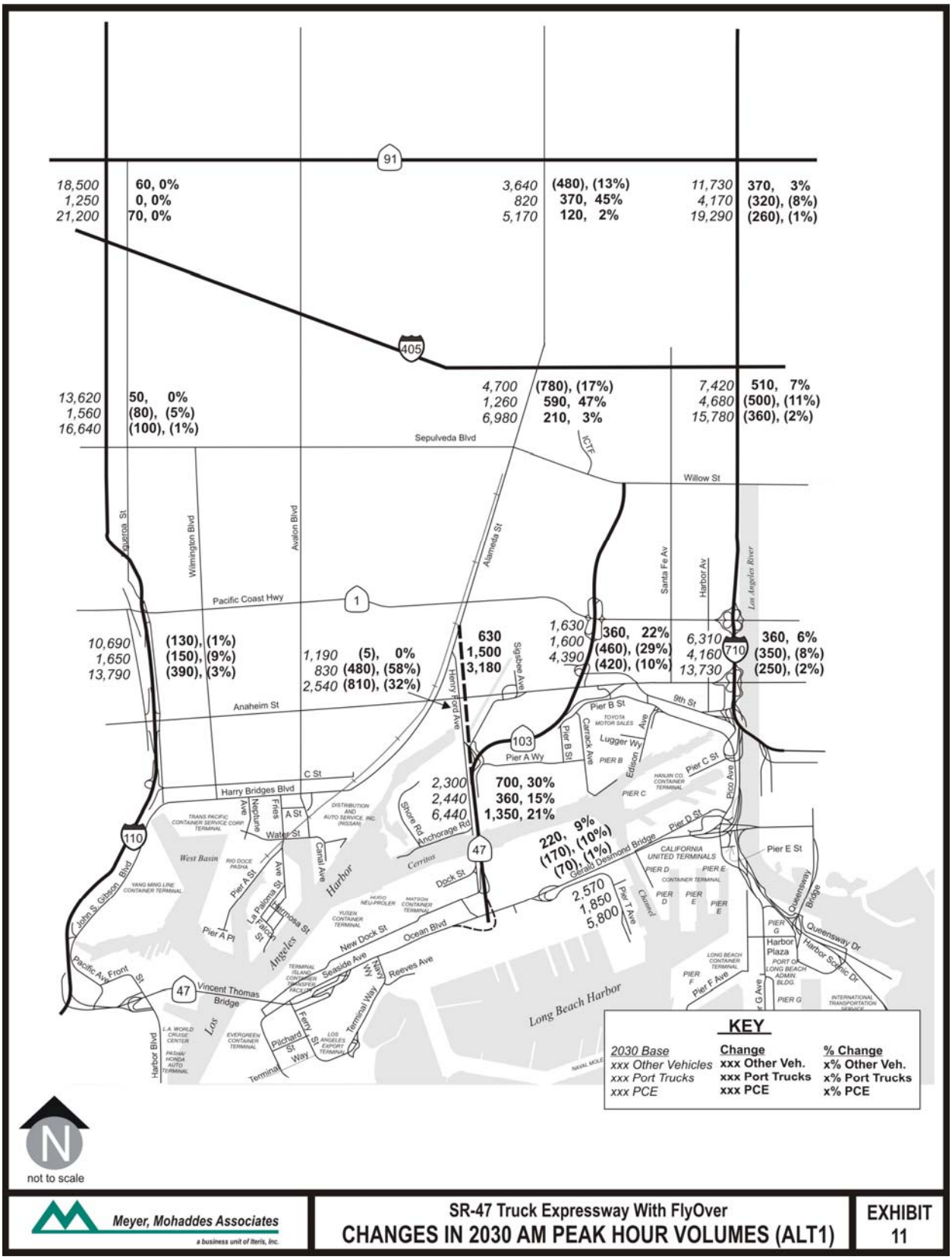
Expressway Segment	Midday Peak Hour	
	Density	LOS
Southbound SR-47 n/o New Dock off-ramp	13.8	B
Southbound SR-47 s/o New Dock off-ramp	10.7	B
Northbound SR-47 n/o New Dock on-ramp	25.5	C
Northbound SR-47 s/o New Dock on-ramp	20.5	C

Mainline Analysis

The mainline level of service results are presented in Table 6. The results indicate that mainline level of service is expected to be E or better during all peak hours on SR-47, SR-103 and I-110 (South of PCH). LOS on I-710 is expected to be F in northbound and southbound directions during all the peak hours. Comparing the results to Table 3, Base No-Project Mainline LOS, the project would result in improved LOS on southbound SR-103 south of PCH during Midday peak hour, on northbound I-110 south of PCH during AM peak, and it would reduce vehicle density on several other analysis segments. The appendix contains the level of service worksheets for the HCM mainline analysis.

Table 6 - Year 2030 Alternative 1 Mainline Level-of-Service (PCE)

Location	**AM**		**MD**		**PM**	
	Density	**LOS**	**Density**	**LOS**	**Density**	**LOS**
NB Alameda Corridor Truck Expressway - s/o SR 1	18.2	C	21.1	C	24.2	C
SB Alameda Corridor Truck Expressway – s/o SR 1	17.1	B	16.8	B	10.5	B
NB SR-103 – s/o PCH	22.0	C	24.4	C	28.6	D
SB SR-103 – s/o PCH	18.1	C	17.9	B	14.3	B
NB Interstate 710 – s/o PCH	> 45	F	>45	F	> 45	F
SB Interstate 710 – s/o PCH	> 45	F	>45	F	> 45	F
NB Interstate 710 – n/o PCH	> 45	F	>45	F	> 45	F
SB Interstate 710 – n/o PCH	> 45	F	>45	F	> 45	F
NB Interstate 110 – s/o PCH	34.3	D	31.2	D	28.0	D
SB Interstate 110 – s/o PCH	25.5	C	29.5	D	36.4	E



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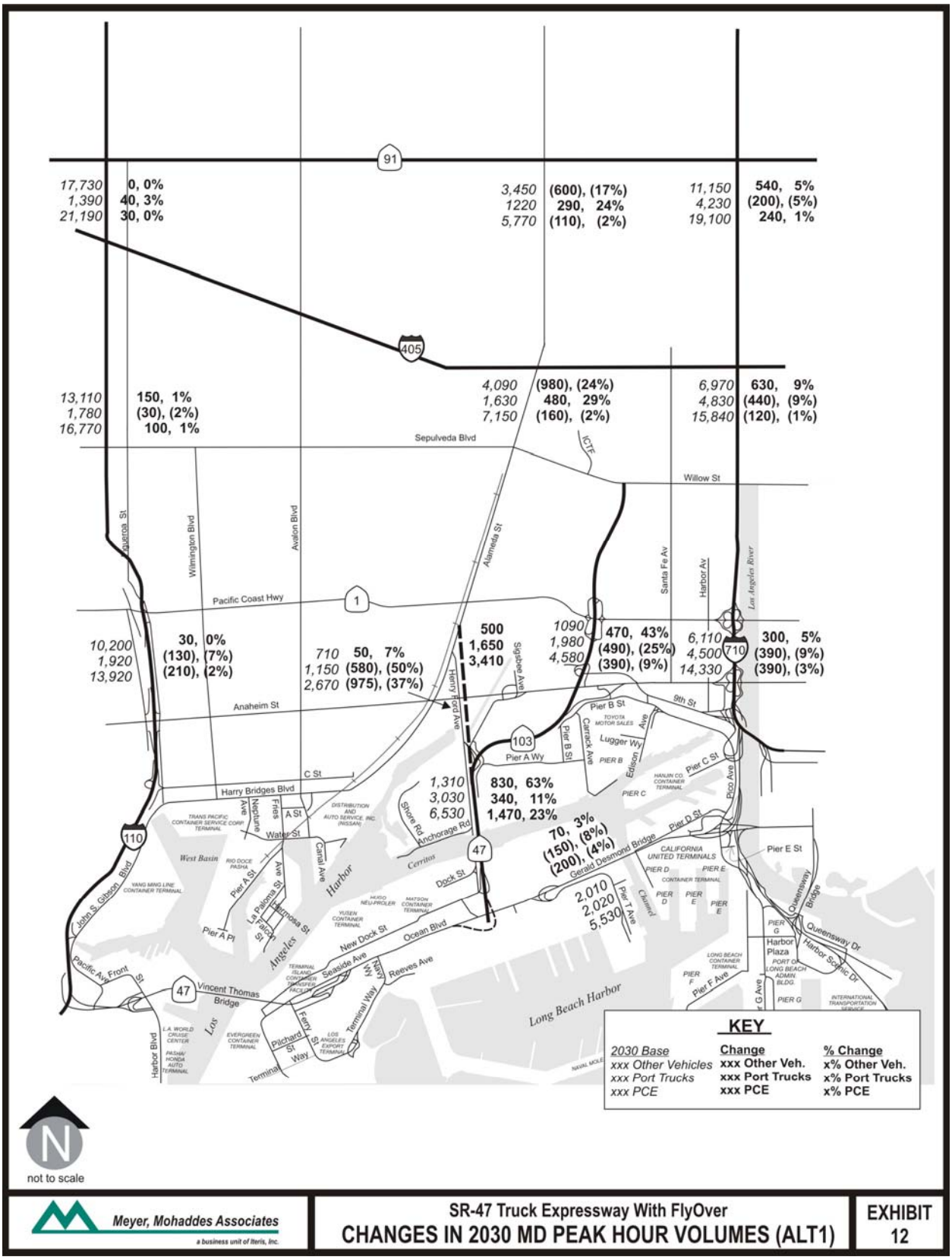
SR-47 Truck Expressway With FlyOver
CHANGES IN 2030 AM PEAK HOUR VOLUMES (ALT1)

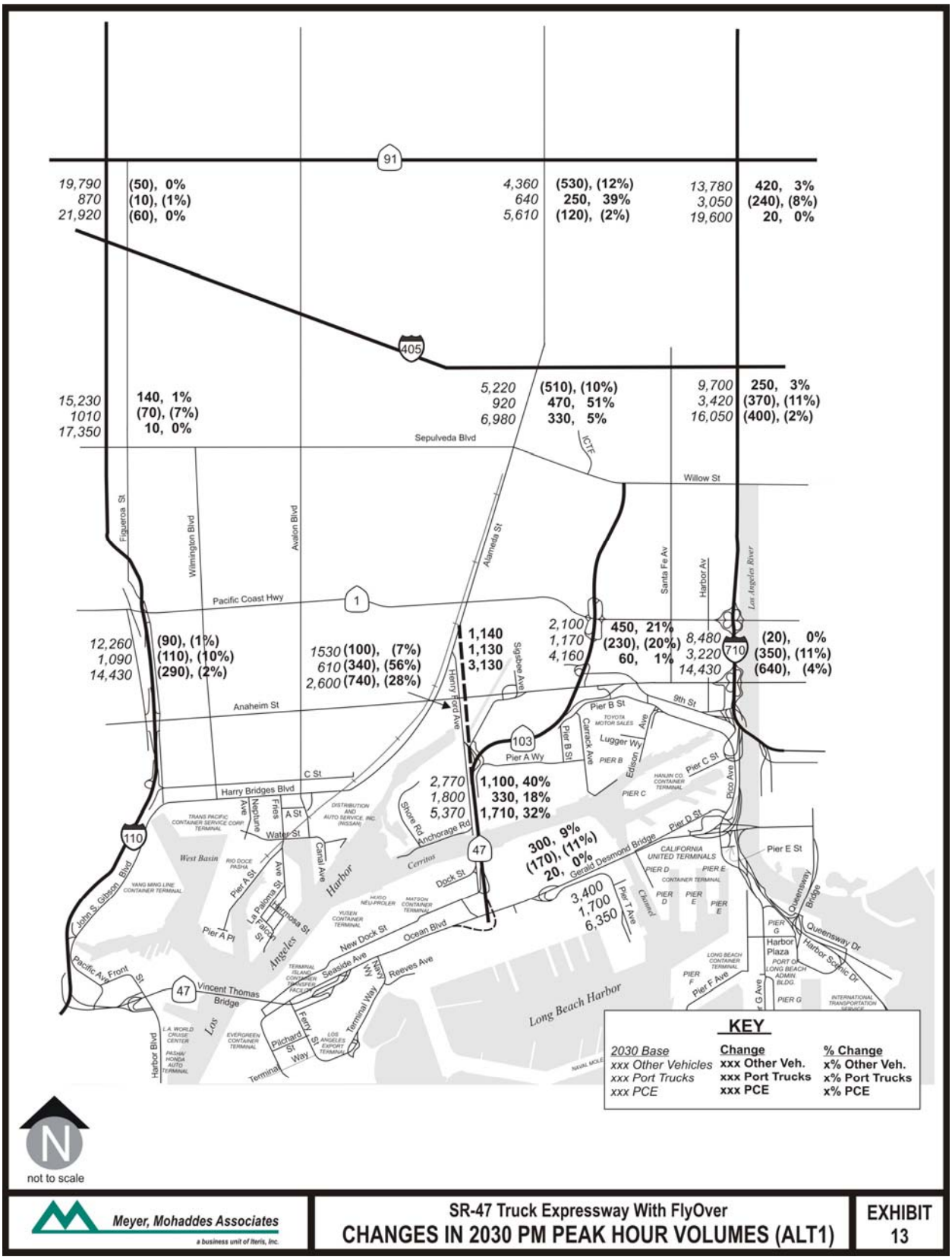
EXHIBIT 11



Meyer, Mohaddes Associates
a business unit of Iteris, Inc.

SR-47 Truck Expressway With FlyOver
CHANGES IN 2030 MD PEAK HOUR VOLUMES (ALT1)

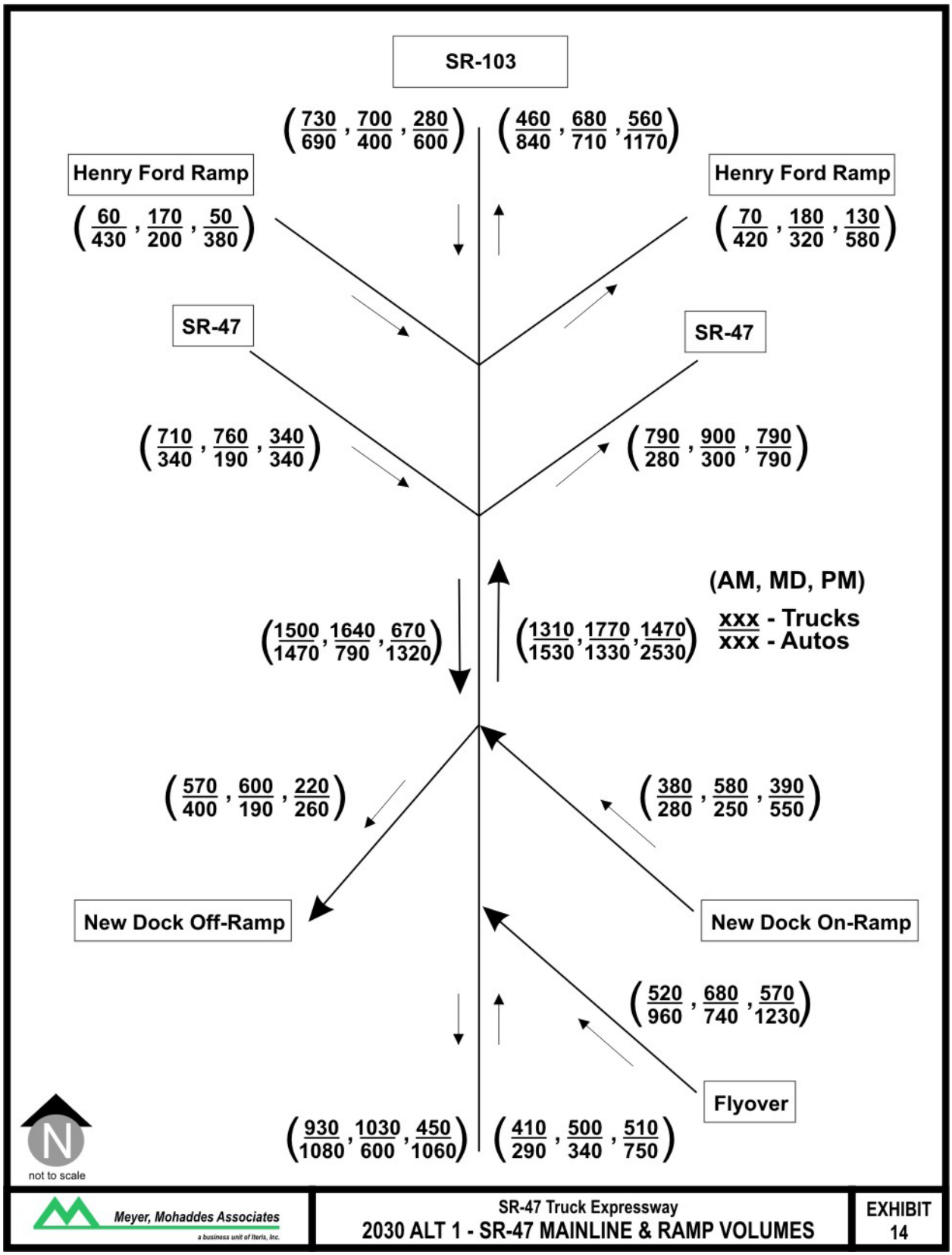
EXHIBIT 12



Meyer, Mohaddes Associates
a business unit of Iteris, Inc.

SR-47 Truck Expressway With FlyOver
CHANGES IN 2030 PM PEAK HOUR VOLUMES (ALT1)

EXHIBIT 13


SR-103
730/690, 700/400, 280/600
460/840, 680/710, 560/1170
Henry Ford Ramp
60/430, 170/200, 50/380
Henry Ford Ramp
70/420, 180/320, 130/580
SR-47
SR-47
710/340, 760/190, 340/340
790/280, 900/300, 790/790
(AM, MD, PM)
xxx - Trucks
xxx - Autos
1500/1470, 1640/790, 670/1320
1310/1530, 1770/1330, 1470/2530
570/400, 600/190, 220/260
380/280, 580/250, 390/550
New Dock Off-Ramp
New Dock On-Ramp
520/960, 680/740, 570/1230
Flyover
930/1080, 1030/600, 450/1060
410/290, 500/340, 510/750
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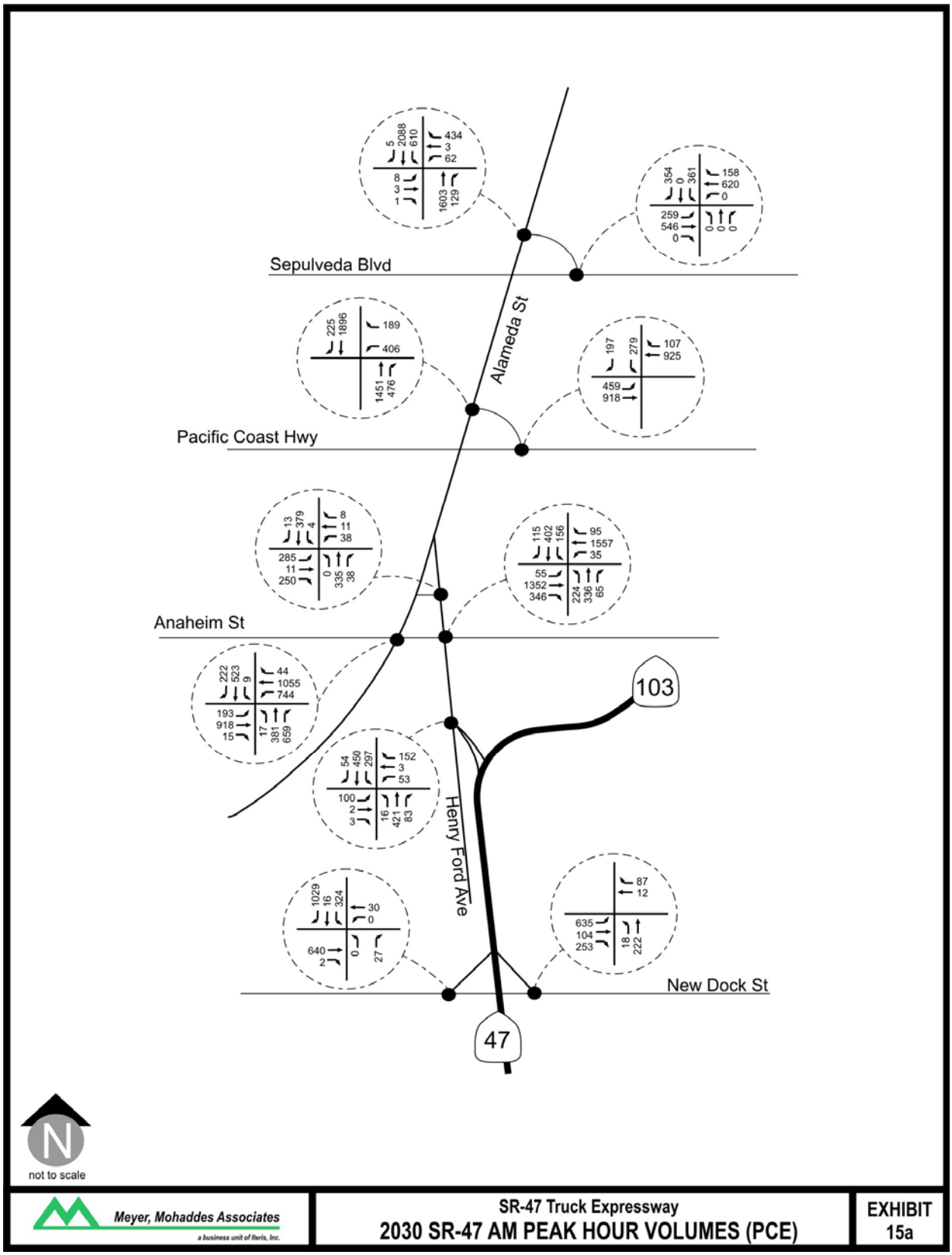
not to scale
Meyer, Mohaddes Associates
a business unit of Iteris, Inc.
SR-47 Truck Expressway
2030 ALT 1 - SR-47 MAINLINE & RAMP VOLUMES
EXHIBIT 14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Pacific Coast Hwy
Anaheim St
New Dock St
Alameda St
Henry Ford Ave
103
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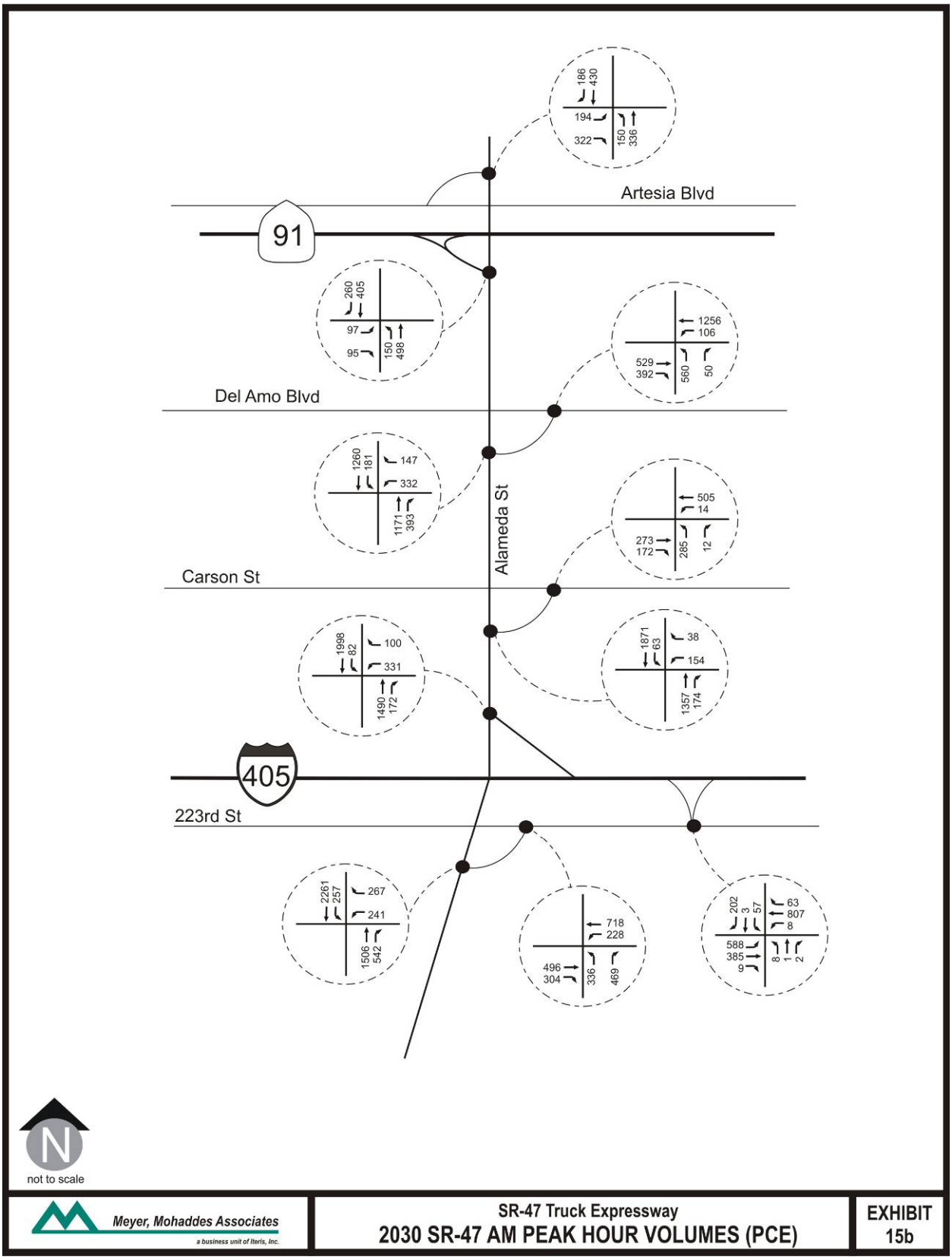
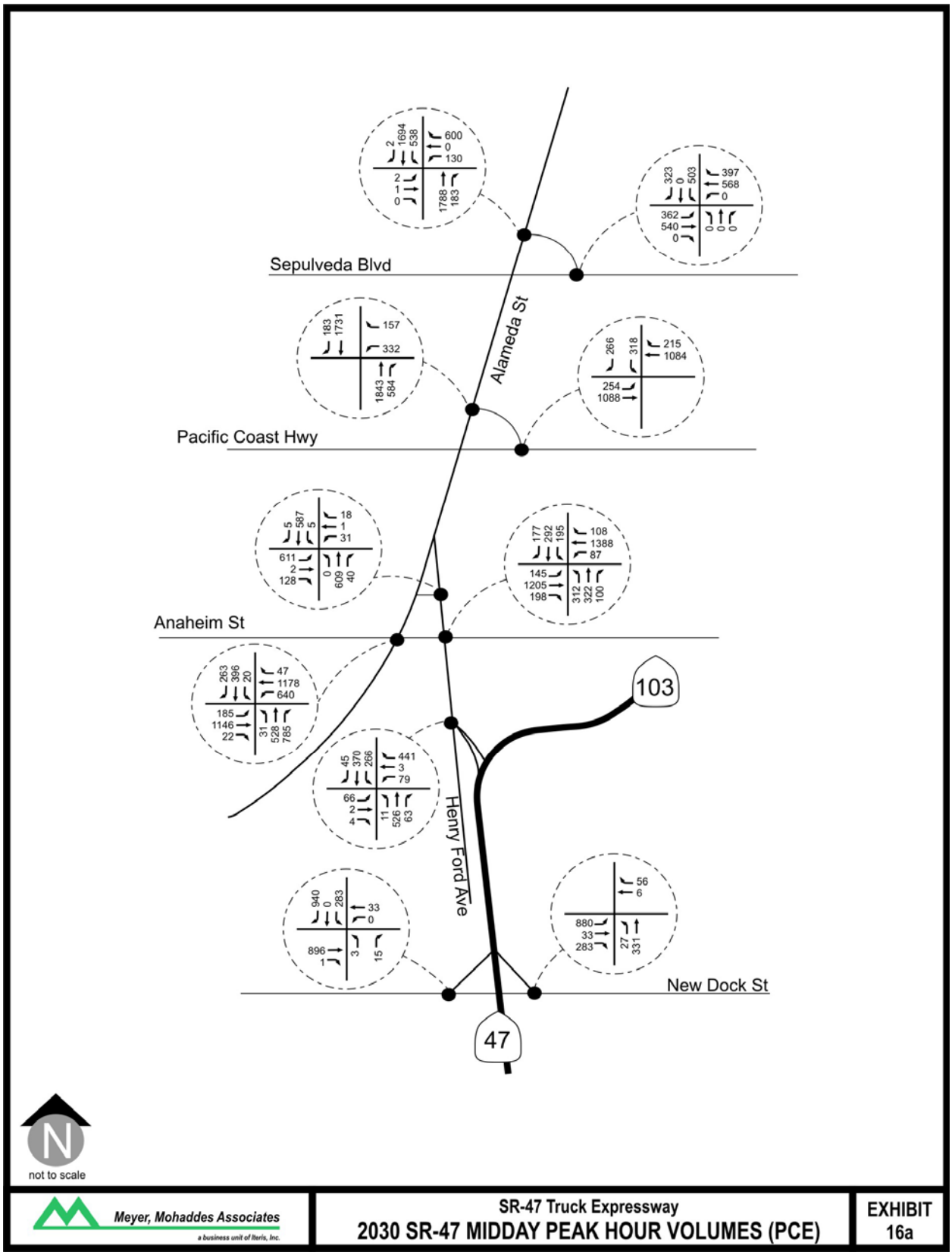
Meyer, Mohaddes Associates
a business unit of Iteris, Inc.
SR-47 Truck Expressway
2030 SR-47 AM PEAK HOUR VOLUMES (PCE)
EXHIBIT
15a



Meyer, Mohaddes Associates
a business unit of Iteris, Inc.

SR-47 Truck Expressway
2030 SR-47 AM PEAK HOUR VOLUMES (PCE)

EXHIBIT 15b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Alameda St
Henry Ford Ave
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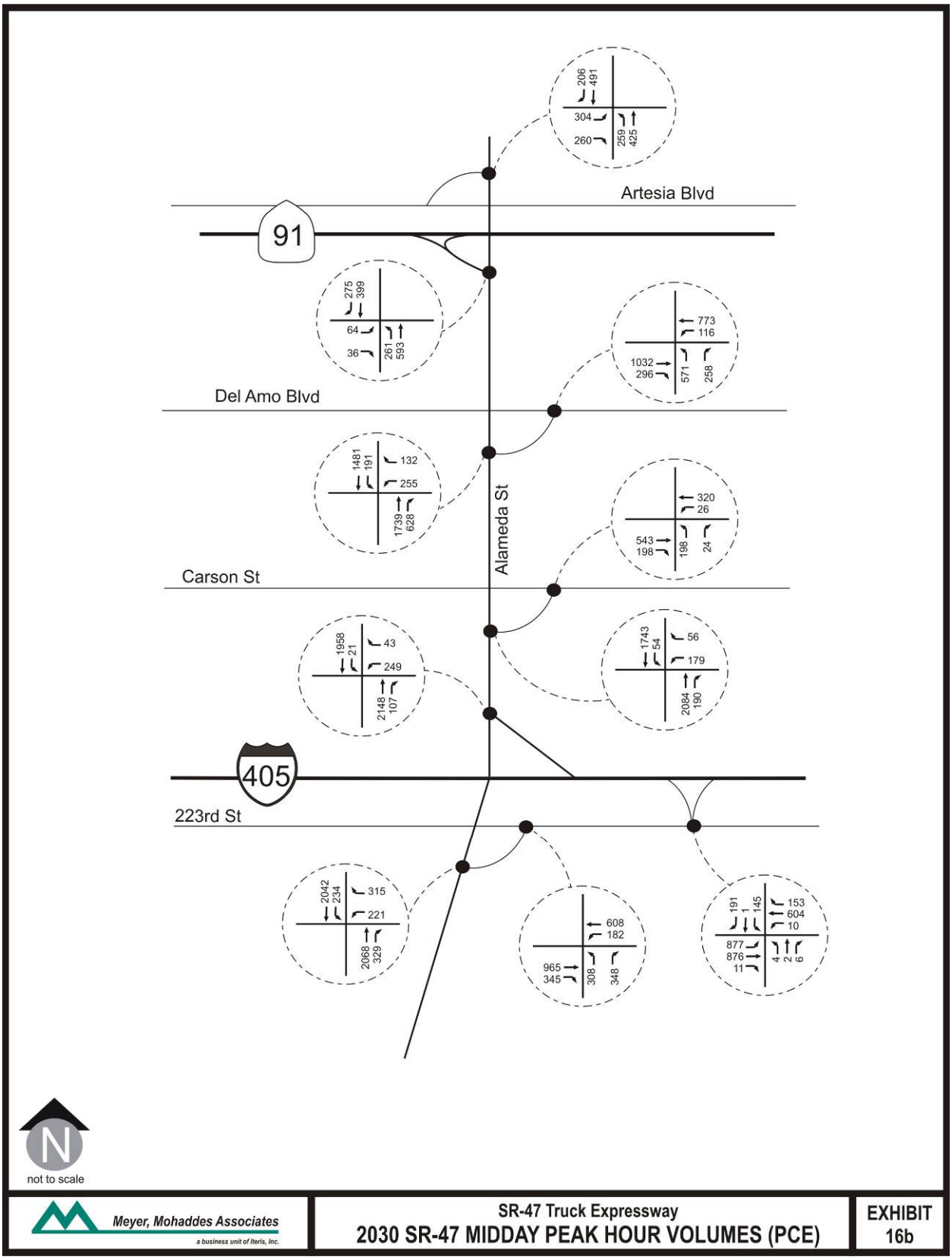
Meyer, Mohaddes Associates
a business unit of Iteris, Inc.
SR-47 Truck Expressway
2030 SR-47 MIDDAY PEAK HOUR VOLUMES (PCE)
EXHIBIT
16a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Carson St
Alameda St
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223rd St
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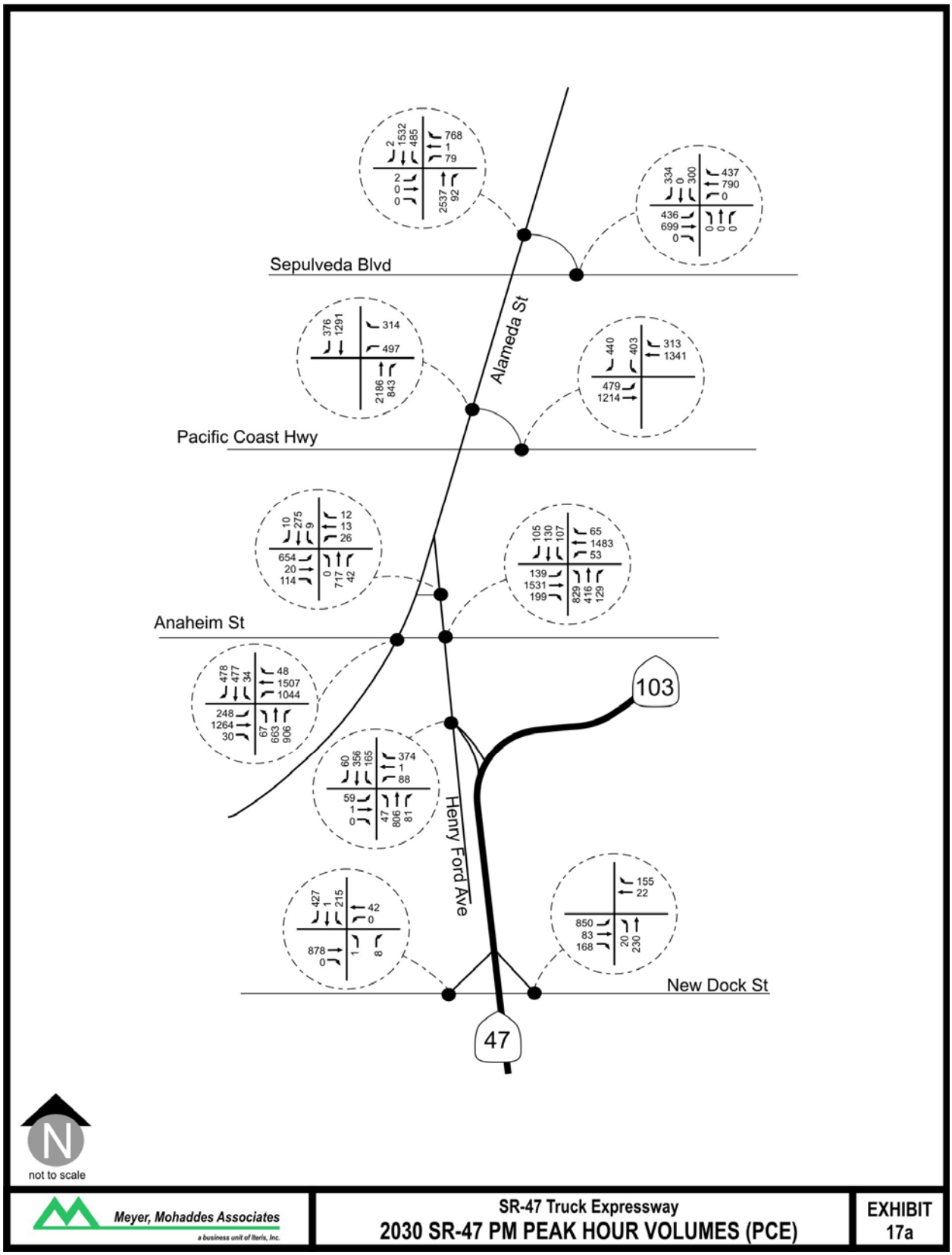
Meyer, Mohaddes Associates
a business unit of Iteris, Inc.
SR-47 Truck Expressway
2030 SR-47 MIDDAY PEAK HOUR VOLUMES (PCE)
EXHIBIT
16b


Sepulveda Blvd
Pacific Coast Hwy
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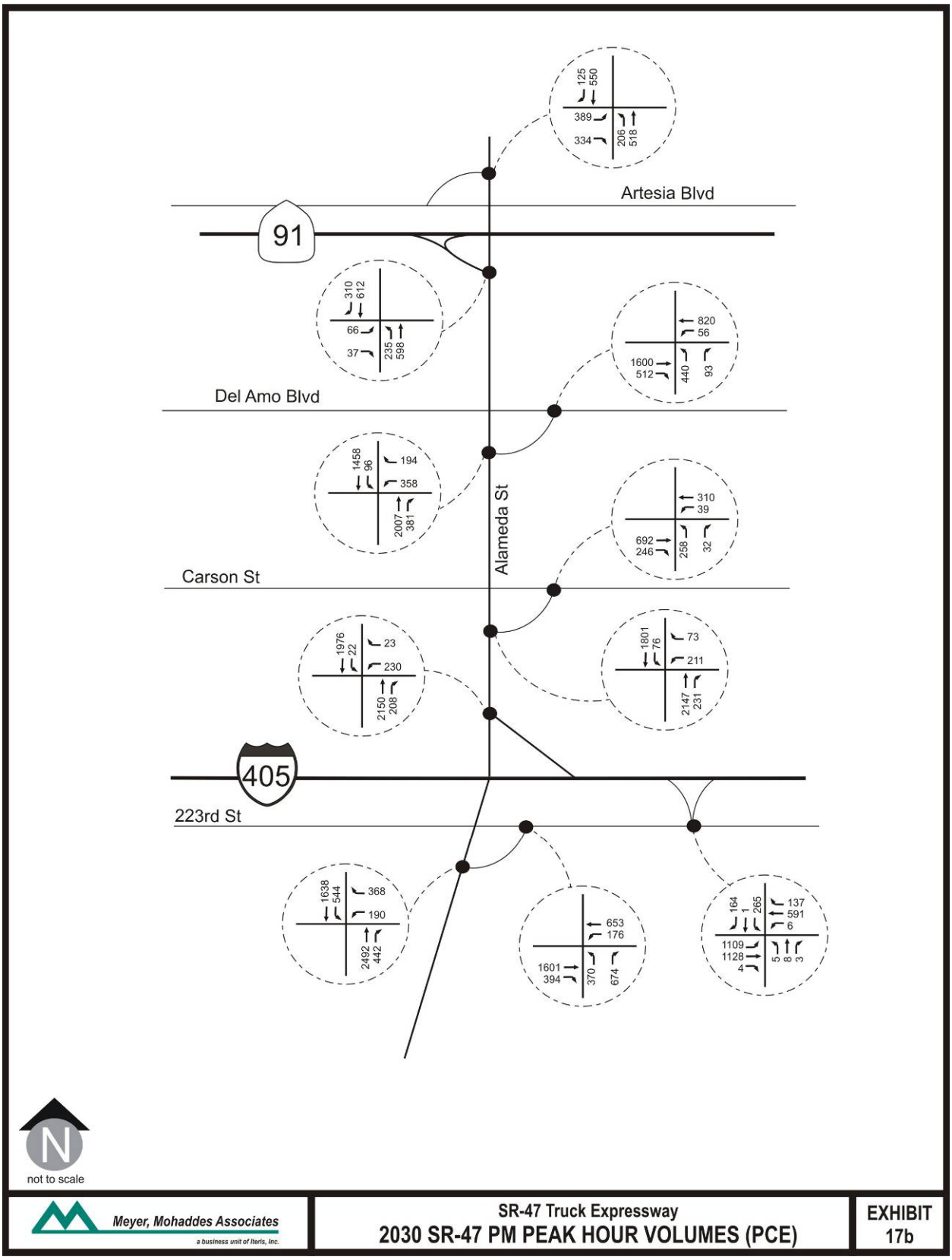
New Dock St
Alameda St
Henry Ford Ave
103
47
not to scale
Meyer, Mohaddes Associates
a business unit of Iteris, Inc.
SR-47 Truck Expressway
2030 SR-47 PM PEAK HOUR VOLUMES (PCE)
EXHIBIT
17a



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SR-47 Truck Expressway
2030 SR-47 PM PEAK HOUR VOLUMES (PCE)

EXHIBIT 17b

Intersection Levels of Service

Tables 7, 8 and 9 summarize the 2030 Alternative 1 AM, Mid-day and PM peak hour levels of service at the intersections in the study area and compare the future with project conditions to the base case without the project. The levels of service calculation sheets are provided in the Appendix. As the data in the tables indicate, the Alternative 1 does not result in any significant impacts at the study intersections with the exception of the Alameda Street and 223rd Street connector ramp under the existing intersection geometrics during the PM peak hour. The SR-47/Ocean Boulevard/Henry Ford Avenue interchange is not included in the table, and the results for that location are presented separately in subsequent sections of the report.

In order to mitigate the impact of additional traffic on the Alameda Street and 223rd Street connector ramp intersections, geometric improvements are made to the intersections as part of the project. A detail traffic operation analysis using SYNCHRO is performed to evaluate the traffic operation of the intersections with the proposed improvements and results are presented in Table 10. As results indicate the intersections with proposed improvements would operate at LOS C or better. The SYNCHRO analysis is provided in Appendix.

Note that at a few locations the forecast is for the volume/capacity ratio to decrease, and the level of service to improve for the project condition compared to the no-project base condition. For the intersections of SR-47 ramps and Henry Ford Avenue, as well as Henry Ford Avenue and Anaheim Street, the improvement is due to the Expressway providing a more attractive alternative route for north/south traffic, thereby greatly reducing the travel demand at those two locations.

The V/C marginally improves at a few other locations north of the Expressway. This is due to the fact that the project primarily contributes added traffic to the north/south through movements exclusively, and north/south through movements are grade separated. The model predicts that in some locations, the turning movements to/from Alameda Street actually would be reduced slightly, primarily due to the increase in north/south through truck volume. That is, the model indicates that some automobile traffic is displaced to other routes due to the higher propensity for trucks and autos to use the grade separated portions of Alameda Street, resulting in move north/south through movements, but less turning movements at the intersections.

Table 7 - 2030 Alternative 1 AM Peak Intersection Conditions (PCE)

Intersection	Base		Alternative 1		
	Volume / Capacity or Delay	LOS	Volume / Capacity or Delay	LOS	Change
SR-47 & New Dock SB Off-Ramp[1]	35.8	E	35	D	-0.8
SR-47 & New Dock NB On-Ramp[1]	15.8	C	13.7	B	-2.1
SR-47 & Henry Ford Ramps	31.4	D	13.6	B	-11.5
Henry Ford Ave & Anaheim St	0.991	E	0.842	D	-0.149
Henry Ford Ave & Denni St	0.54	A	0.38	A	-0.16
Alameda St & Anaheim St	0.822	D	0.81	D	-0.012
Alameda St / PCH Connector Ramp n/o PCH	1.266	F	0.692	B	-0.574
PCH / Alameda St Connector Ramp e/o Alameda St	1.001	F	0.759	C	-0.242
Alameda St / Sepulveda Blvd Connector Ramp n/o Sepulveda	1.011	F	0.942	E	-0.069
Sepulveda Blvd / Alameda St Connector Ramp e/o Alameda St	0.781	C	0.756	C	-0.025
Alameda St / 223rd St Connector Ramp s/o 223rd St[2]	0.857	D	0.829	D	-0.028
223rd St / Alameda St Connector Ramp e/o Alameda St[2]	0.62	B	0.542	A	-0.078
223rd St & I-405 SB Ramps	0.552	A	0.58	A	0.028
Alameda St & I-405 NB Ramps	0.691	B	0.7	B	0.009
Alameda St / Carson St Connector Ramp s/o Carson St	0.469	A	0.472	A	0.003
Carson St / Alameda St Connector Ramp e/o Alameda St	0.403	A	0.377	A	-0.026
Alameda St / Del Amo Blvd Connector Ramp s/o Del Amo	0.611	B	0.564	A	-0.047
Del Amo Blvd / Alameda St Connector Ramp e/o Alameda St	0.676	B	0.566	A	-0.11
Alameda St & SR-91 EB Ramps	0.263	A	0.268	A	0.005
Alameda St & Artesia Blvd n/o Artesia Blvd	0.32	A	0.331	A	0.011

1. Unsignalized intersection – analyzed using HCM delay based methodology.
2. Analysis is based on the existing intersection geometrics.

Table 8 - 2030 Alternative 1 MD Peak Intersection Conditions (PCE)

Intersection	Base		Alternative 1		
	Volume / Capacity or Delay	LOS	Volume / Capacity or Delay	LOS	Change
SR-47 & New Dock SB Off-Ramp[1]	68.8	F	35.2	E	-33.6
SR-47 & New Dock NB On-Ramp[1]	29.5	D	21.3	C	-8.2
SR-47 & Henry Ford Ramps	75.5	F	13.9	B	-43.4
Henry Ford Ave & Anaheim St	1.073	F	0.881	D	-0.192
Henry Ford Ave & Denni St	0.778	C	0.682	B	-0.096
Alameda St & Anaheim St	1.095	F	0.975	E	-0.12
Alameda St / PCH Connector Ramp n/o PCH	1.357	F	0.631	B	-0.726
PCH / Alameda St Connector Ramp e/o Alameda St	0.949	E	0.705	C	-0.244
Alameda St / Sepulveda Blvd Connector Ramp n/o Sepulveda	1.16	F	0.992	E	-0.168
Sepulveda Blvd / Alameda St Connector Ramp e/o Alameda St	0.909	E	0.847	D	-0.062
Alameda St / 223rd St Connector Ramp s/o 223rd St[2]	0.993	E	0.880	D	-0.113
223rd St / Alameda St Connector Ramp e/o Alameda St[2]	0.639	B	0.625	B	-0.014
223rd St & I-405 SB Ramps	0.7	C	0.653	B	-0.047
Alameda St & I-405 NB Ramps	0.711	C	0.717	C	0.006
Alameda St / Carson St Connector Ramp s/o Carson St	0.64	B	0.607	B	-0.033
Carson St / Alameda St Connector Ramp e/o Alameda St	0.432	A	0.417	A	-0.015
Alameda St / Del Amo Blvd Connector Ramp s/o Del Amo	0.724	C	0.726	C	0.002
Del Amo Blvd / Alameda St Connector Ramp e/o Alameda St	0.577	A	0.543	A	-0.034
Alameda St & SR-91 EB Ramps	0.358	A	0.321	A	-0.037
Alameda St & Artesia Blvd n/o Artesia Blvd	0.543	A	0.471	A	-0.072

1. Unsignalized intersection – analyzed using HCM delay based methodology.
2. Analysis is based on the existing intersection geometrics.

Table 9 - 2030 Alternative 1 PM Peak Intersection Conditions (PCE)

Intersection	Base		Alternative 1		
	Volume / Capacity or Delay	LOS	Volume / Capacity or Delay	LOS	Change
SR-47 & New Dock SB Off-Ramp[1]	15.6	C	13.6	B	-2
SR-47 & New Dock NB On-Ramp[1]	37.1	E	19.3	C	-17.8
SR-47 & Henry Ford Ramps	139.6	F	18.9	C	-97.2
Henry Ford Ave & Anaheim St	1.167	F	1.013	F	-0.154
Henry Ford Ave & Denni St	0.812	D	0.753	C	-0.059
Alameda St & Anaheim St	1.122	F	1.114	F	-0.008
Alameda St / PCH Connector Ramp n/o PCH	1.367	F	0.893	D	-0.474
PCH / Alameda St Connector Ramp e/o Alameda St	1.024	F	1.006	F	-0.018
Alameda St / Sepulveda Blvd Connector Ramp n/o Sepulveda	1.296	F	1.14	F	-0.156
Sepulveda Blvd / Alameda St Connector Ramp e/o Alameda St	1.008	F	0.976	E	-0.032
Alameda St / 223rd St Connector Ramp s/o 223rd St[2]	1.093	F	1.201	F	0.108
223rd St / Alameda St Connector Ramp e/o Alameda St[2]	0.901	E	1.035	F	0.134
223rd St & I-405 SB Ramps	0.683	B	0.796	C	0.113
Alameda St & I-405 NB Ramps	0.711	C	0.728	C	0.017
Alameda St / Carson St Connector Ramp s/o Carson St	0.697	B	0.656	B	-0.041
Carson St / Alameda St Connector Ramp e/o Alameda St	0.562	A	0.538	A	-0.024
Alameda St / Del Amo Blvd Connector Ramp s/o Del Amo	0.792	C	0.734	C	-0.058
Del Amo Blvd / Alameda St Connector Ramp e/o Alameda St	0.678	B	0.583	A	-0.095
Alameda St & SR-91 EB Ramps	0.333	A	0.354	A	0.021
Alameda St & Artesia Blvd n/o Artesia Blvd	0.502	A	0.488	A	-0.014

1. Unsignalized intersection – analyzed using HCM delay based methodology.
2. Analysis is based on the existing intersection geometrics.

Table 10 - Year 2030 Alternative 1 – Alameda Street/223rd Street Traffic Operation Analysis

Intersection		AM Peak		Cycle Length (sec.)	MD Peak		Cycle Length (sec.)	PM Peak		Cycle Length (sec.)
		LOS	Delay (sec.)		LOS	Delay (sec.)		LOS	Delay (sec.)	
1	Alameda St / 223rd St Connector Ramp s/o 223rd St	B	20	120	B	19.9	120	C	25.4	120
2	223rd St / Alameda St Connector Ramp e/o Alameda St	B	18.6	120	B	17.4	120	C	31.4	120

SR-47/Ocean Boulevard/Pier S Avenue Interchange Analysis

The results of the Synchro analysis of SR-47/Ocean Boulevard/Henry Ford Avenue interchange are summarized in Table 11 below. The results indicate that interchange level of service is expected to be D or better during all peak hours.

Table 11 - 2030 Alternative 1 SR-47/Ocean Boulevard/Pier S Avenue Interchange Analysis Results

Scenario	Time Period	Average Intersection Delay		Overall Intersection Level of Service	
		Henry Ford	Ocean Blvd	Henry Ford	Ocean Blvd
Base	**AM**	41.5	69.2	D	E
	Mid-day	45.0	77.2	D	E
	PM	36.6	50.8	D	D
SR-47 Expressway	**AM**	28.5	49.1	C	D
	Mid-day	30.8	47.6	C	D
	PM	23.4	43.9	C	D

YEAR 2030 ALTERNATIVE 2 TRAFFIC CONDITIONS

Year 2030 traffic volumes with Alternative 2 which includes an elevated flyover connecting eastbound Ocean Boulevard traffic to northbound SR-47 for the roadways and intersections within the study area were developed using the methodology described in the "Traffic Volume Development" section above. The analysis of study area traffic operations for the Year 2030 scenario Alternative 2 includes weaving and intersection analysis, as summarized below. Exhibits 18, 19 and 20 illustrate Year 2030 link traffic volumes and changes in traffic flow due to the project. SR-47 mainline and ramp volumes for the 2030 Alternative 2 AM, MD and PM peak hours are shown in Exhibit 21. Exhibits 22, 23 and 24 illustrate study intersection volumes with Alternative 2, for the AM, MD and PM peak hours, respectively.

Expressway Weaving Analysis

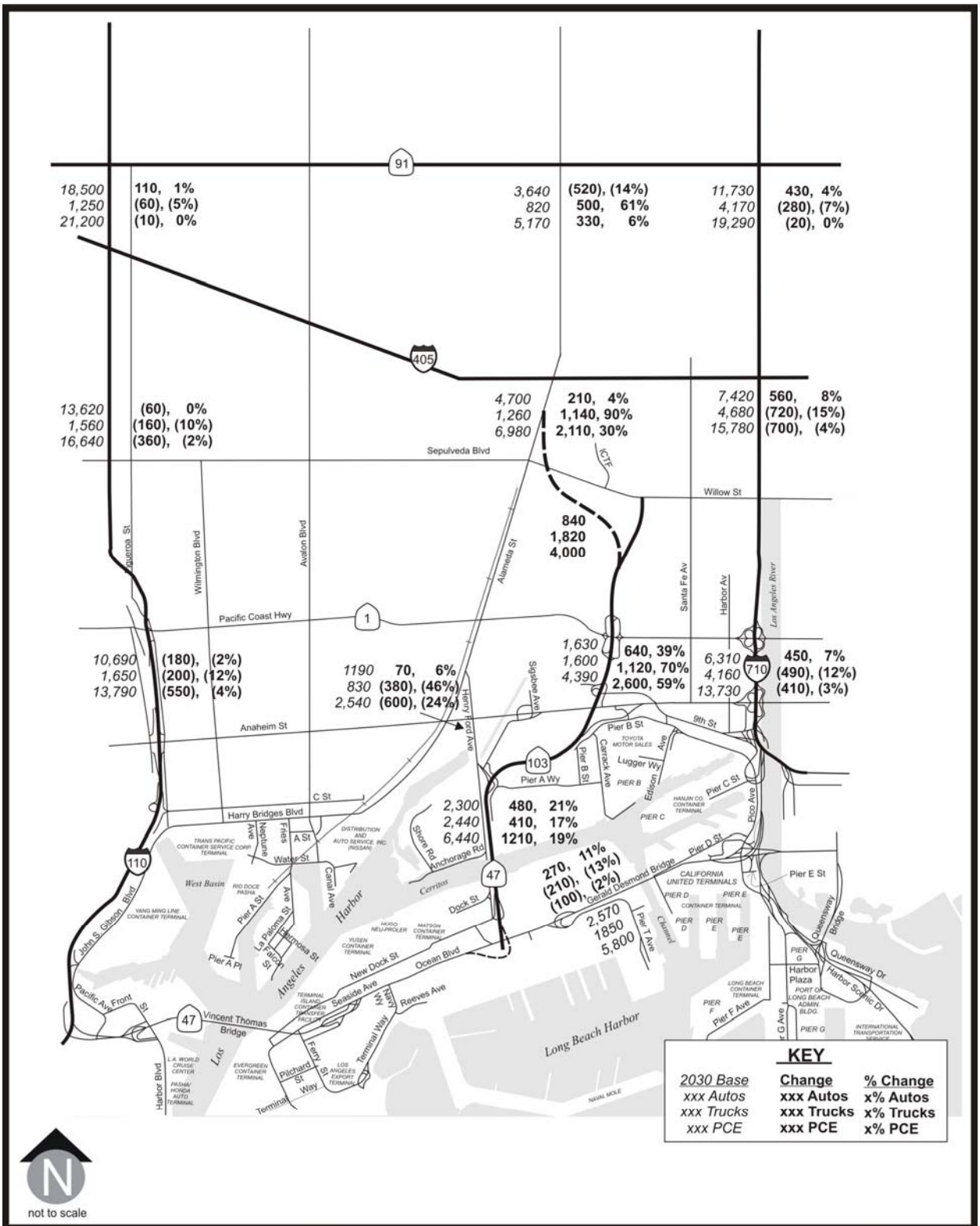
No Expressway weaving analysis is required for 2030 Alternative 2 as there will only be a weaving section with Alternative 1.

Mainline Analysis

The results of the 2030 Alternative 2 Expressway Mainline analysis, Table 12, indicate that the mainline level of service is expected to be LOS E or better during all peak hours on SR 103 and I-110 (South of PCH). LOS on I-710 is expected to be F in the northbound southbound directions for all three-peak hours. Alternative 2 is projected to improve LOS on I-110 south of PCH, and it would reduce vehicle density on several other analysis segments. The appendix contains the level of service worksheets for the HCM analysis.

Table 12 - Year 2030 Alternative 2 Mainline Level-of-Service (PCE)

Location	AM		MD		PM	
	Density	LOS	Density	LOS	Density	LOS
NB Alameda Corridor Truck Expressway - s/o SR 1	NA	NA	NA	NA	NA	NA
SB Alameda Corridor Truck Expressway – s/o SR 1	NA	NA	NA	NA	NA	NA
NB SR-103 – s/o PCH	40.1	E	40.7	E	40.9	E
SB SR-103 – s/o PCH	34.7	D	33.3	D	23.5	C
NB Interstate 710 – s/o PCH	44.0	E	>45	F	> 45	F
SB Interstate 710 – s/o PCH	> 45	F	>45	F	> 45	F
NB Interstate 710 – n/o PCH	> 45	F	>45	F	> 45	F
SB Interstate 710 – n/o PCH	> 45	F	>45	F	> 45	F
NB Interstate 110 – s/o PCH	33.3	D	30.3	D	27.8	D
SB Interstate 110 – s/o PCH	25.4	C	29.5	D	36.1	E



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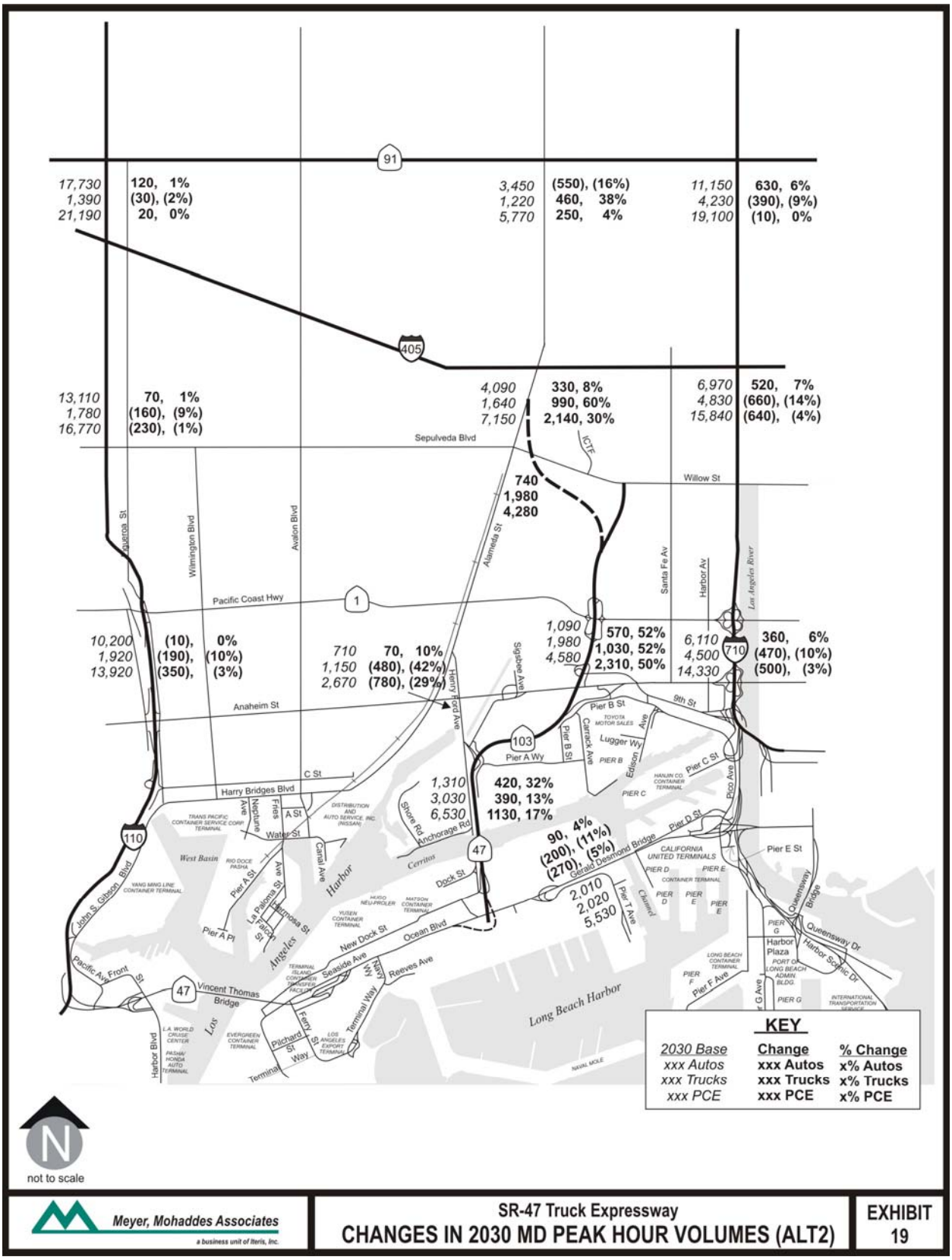
SR-47 Truck Expressway
CHANGES IN 2030 AM PEAK HOUR VOLUMES (ALT2)

EXHIBIT 18


91
405
1
710
103
110
47
17,730
1,390
21,190
120, 1%
(30), (2%)
20, 0%
3,450
1,220
5,770
(550), (16%)
460, 38%
250, 4%
11,150
4,230
19,100
630, 6%
(390), (9%)
(10), 0%
13,110
1,780
16,770
70, 1%
(160), (9%)
(230), (1%)
4,090
1,640
7,150
330, 8%
990, 60%
2,140, 30%
6,970
4,830
15,840
520, 7%
(660), (14%)
(640), (4%)
Sepulveda Blvd
ICTF
Willow St
740
1,980
4,280
Alameda St
Santa Fe Av
Harbor Av
Los Angeles River
Pacific Coast Hwy
1,090
1,980
4,580
570, 52%
1,030, 52%
2,310, 50%
6,110
4,500
14,330
360, 6%
(470), (10%)
(500), (3%)
10,200
1,920
13,920
(10),
(190),
(350),
0%
(10%)
(3%)
710
1,150
2,670
70, 10%
(480), (42%)
(780), (29%)
Harry Ford Ave
Sigabee Ave
Anaheim St
9th St
Pier B St
Carrack Ave
Lugger Wy
Edison Ave
Pier A Wy
Pier C St
Pico Ave
C St
Harry Bridges Blvd
1,310
3,030
6,530
420, 32%
390, 13%
1130, 17%
Store Rd
Anchorage Rd
90, 4%
(200), (11%)
(270), (5%)
Gerald Desmond Bridge
Pier D St
Pier E St
Queensway Bridge
Queensway Dr
Harbor Scenic Dr
Harbor Plaza
2,010
2,020
5,530
Pier T Ave
Channel
Pier F Ave
Long Beach Harbor
Vincent Thomas Bridge
Pacific Ave
Front St
John S. Gibson Blvd
Harbor Blvd
Pier A Pl
New Dock St
Ocean Blvd
Seaside Ave
Reeves Ave
Terminal Way
Pilchard St
Ferry St
Harry Way
Dock St
Canal Ave
Neptune Ave
Fries Ave
A St
Water St
Pier A St
La Paloma St
Termosa St
Tacoma St
Guerosa St
Wilmington Blvd
Avalon Blvd
West Basin
Harbor
Los Angeles
Cerritos
KEY
2030 Base
xxx Autos
xxx Trucks
xxx PCE
Change
xxx Autos
xxx Trucks
xxx PCE
% Change
x% Autos
x% Trucks
x% PCE
N
not to scale
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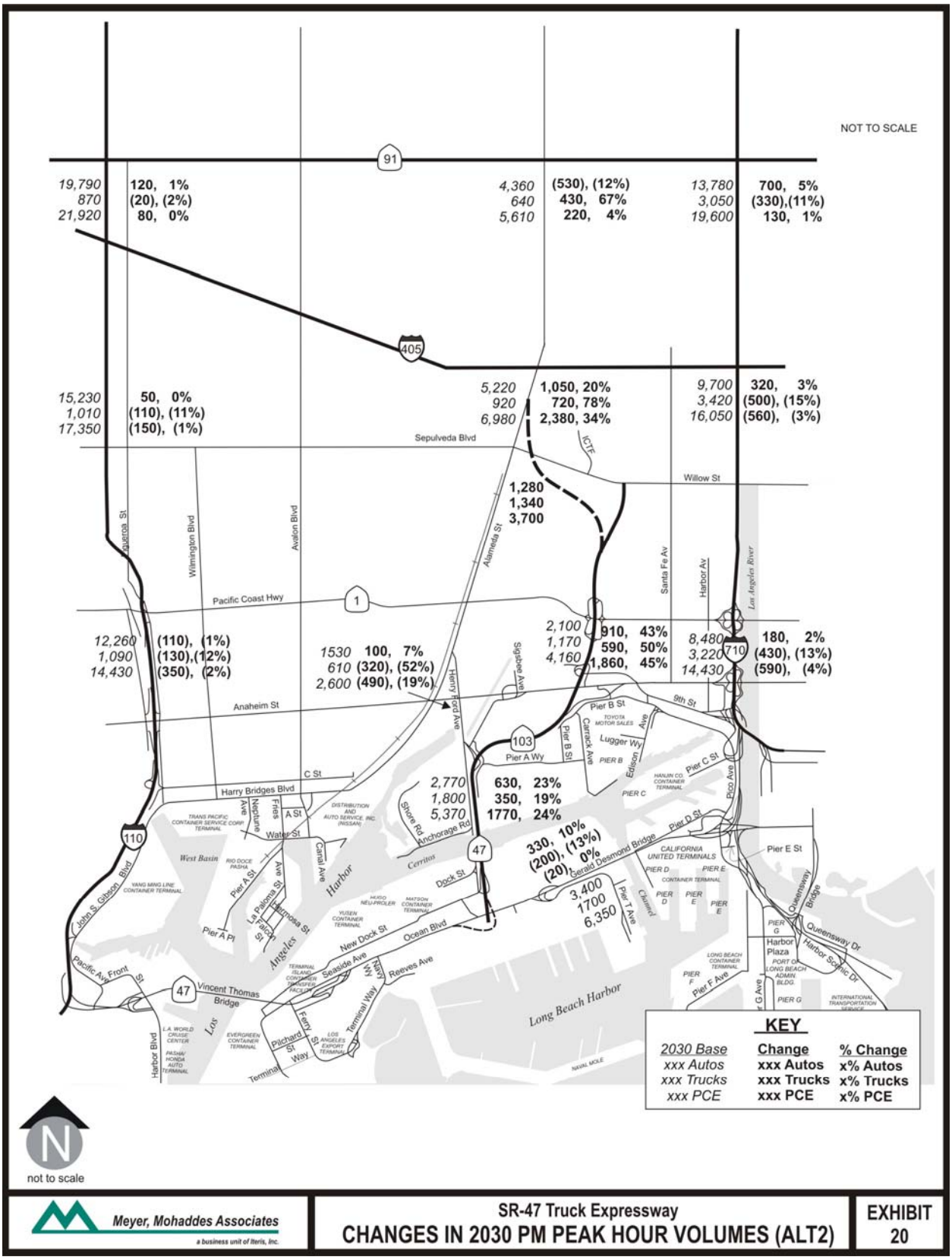
SR-47 Truck Expressway
CHANGES IN 2030 MD PEAK HOUR VOLUMES (ALT2)
EXHIBIT
19


NOT TO SCALE
91
405
1
710
103
47
110
19,790 870 21,920
120, 1% (20), (2%) 80, 0%
4,360 640 5,610
(530), (12%) 430, 67% 220, 4%
13,780 3,050 19,600
700, 5% (330),(11%) 130, 1%
15,230 1,010 17,350
50, 0% (110), (11%) (150), (1%)
5,220 920 6,980
1,050, 20% 720, 78% 2,380, 34%
9,700 3,420 16,050
320, 3% (500), (15%) (560), (3%)
Sepulveda Blvd
ICTF
Willow St
1,280 1,340 3,700
Pacific Coast Hwy
12,260 1,090 14,430
(110), (1%) (130),(12%) (350), (2%)
1530 610 2,600
100, 7% (320), (52%) (490), (19%)
2,100 1,170 4,160
910, 43% 590, 50% 1,860, 45%
8,480 3,220 14,430
180, 2% (430), (13%) (590), (4%)
Anaheim St
9th St
Pier B St
Pier A Wy
Harry Bridges Blvd
C St
2,770 1,800 5,370
630, 23% 350, 19% 1770, 24%
330, 10% (200), (13%) (20), 0%
Gerald Desmond Bridge
3,400 1700 6,350
Pier T Ave
Pier E St
Queensway Bridge
Queensway Dr
Harbor Scenic Dr
Harbor Plaza
Pier F Ave
Long Beach Harbor
Vincent Thomas Bridge
Harbor Blvd
Pacific Ave
Front St
Pier A Pl
New Dock St
Ocean Blvd
Seaside Ave
Reeves Ave
Terminal Way
Pichard St
Ferry St
Dock St
Anchorage Rd
Sigsbee Ave
Harry Ford Ave
Alameda St
Santa Fe Av
Harbor Av
Los Angeles River
Avalon Blvd
Wilmington Blvd
Alameda St
Pico Ave
Edison Ave
Lugger Wy
Carrack Ave
Pier B St
Pier C St
Pier D St
Neptune Ave
Fries Ave
A St
Water St
Canal Ave
Pier A St
La Paloma St
Termosa St
Pier A Pl
John S. Gibson Blvd
West Basin
Harbor
Cerritos
Channel
KEY
2030 Base
xxx Autos
xxx Trucks
xxx PCE
Change
xxx Autos
xxx Trucks
xxx PCE
% Change
x% Autos
x% Trucks
x% PCE
N
not to scale
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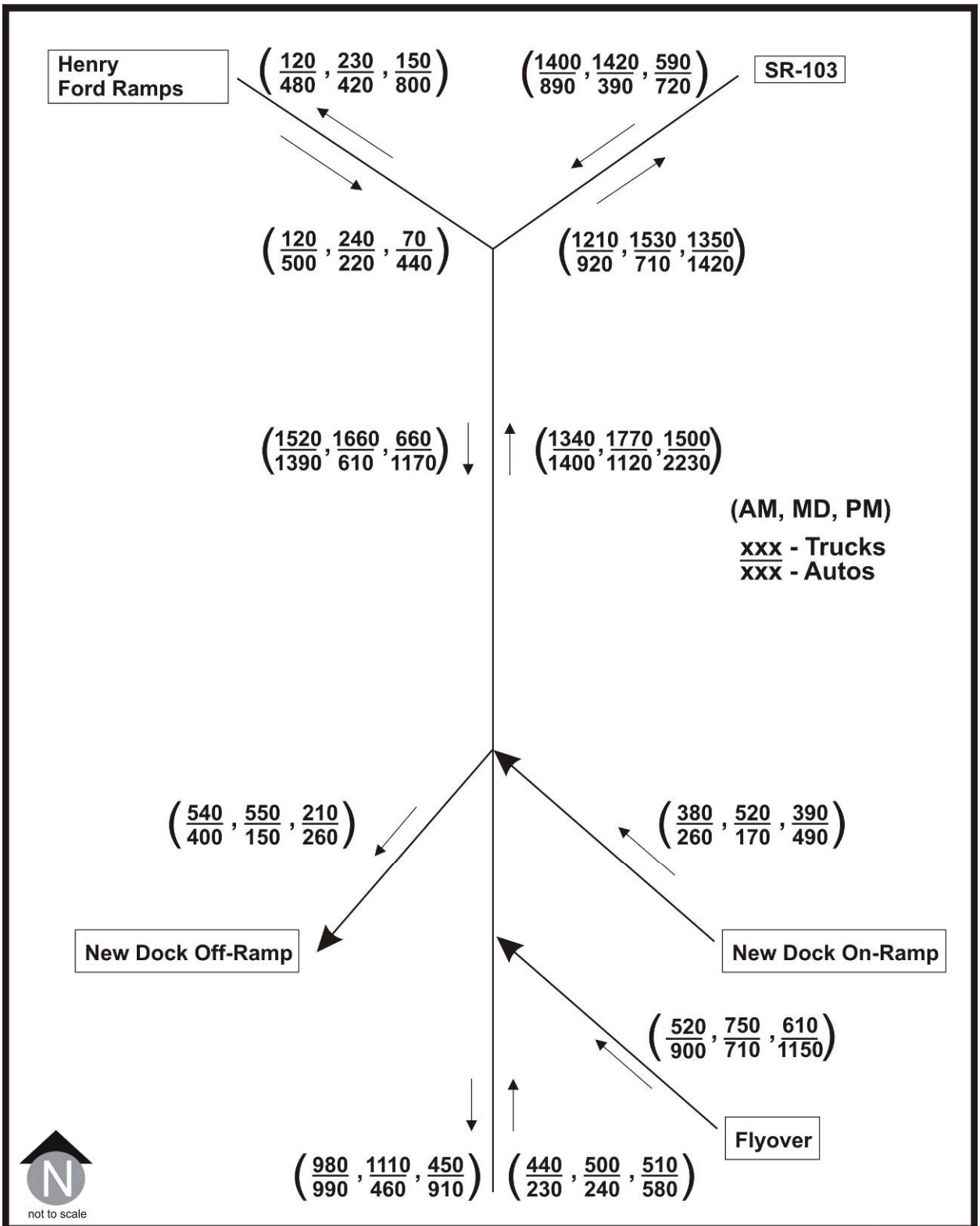
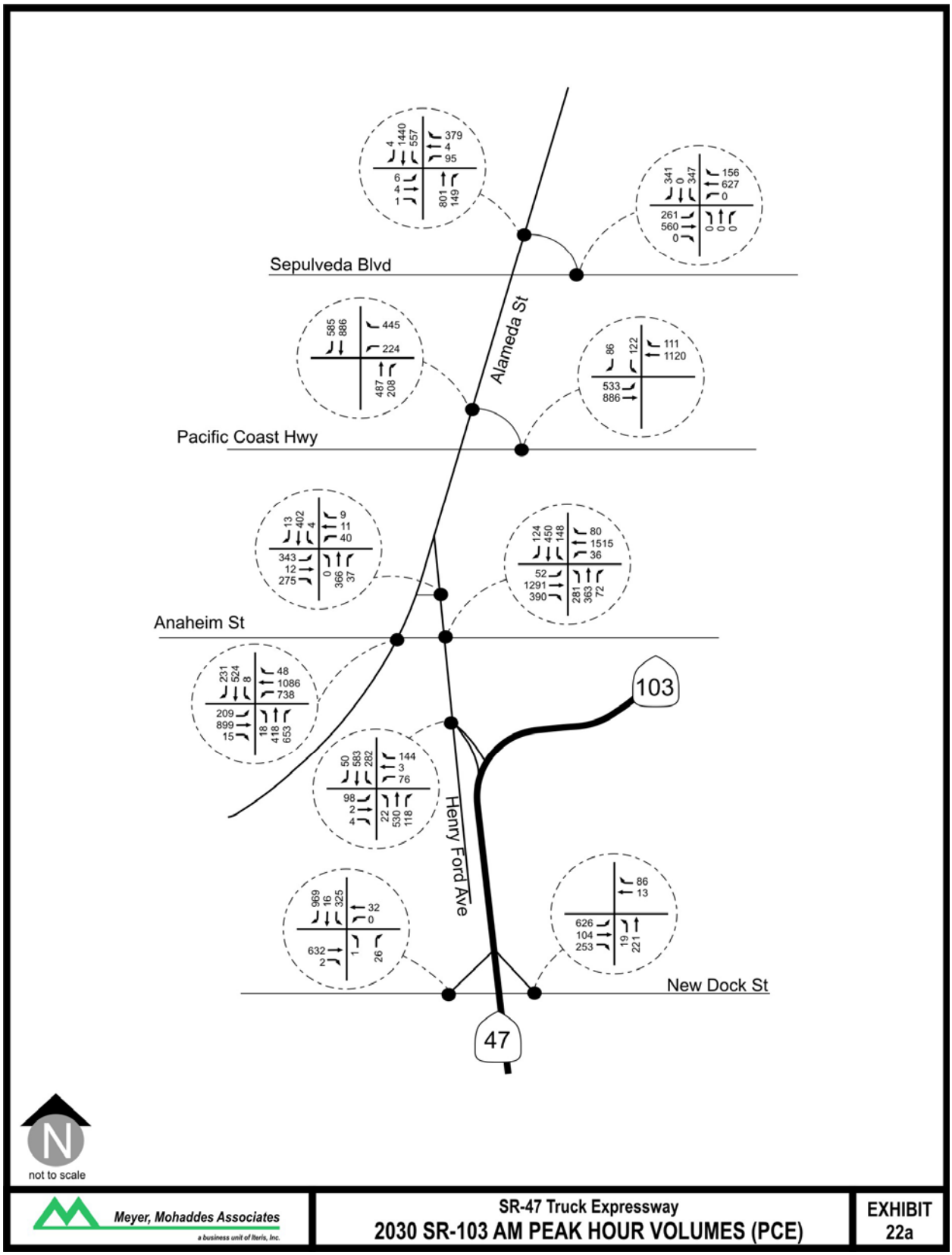
SR-47 Truck Expressway
CHANGES IN 2030 PM PEAK HOUR VOLUMES (ALT2)
EXHIBIT 20

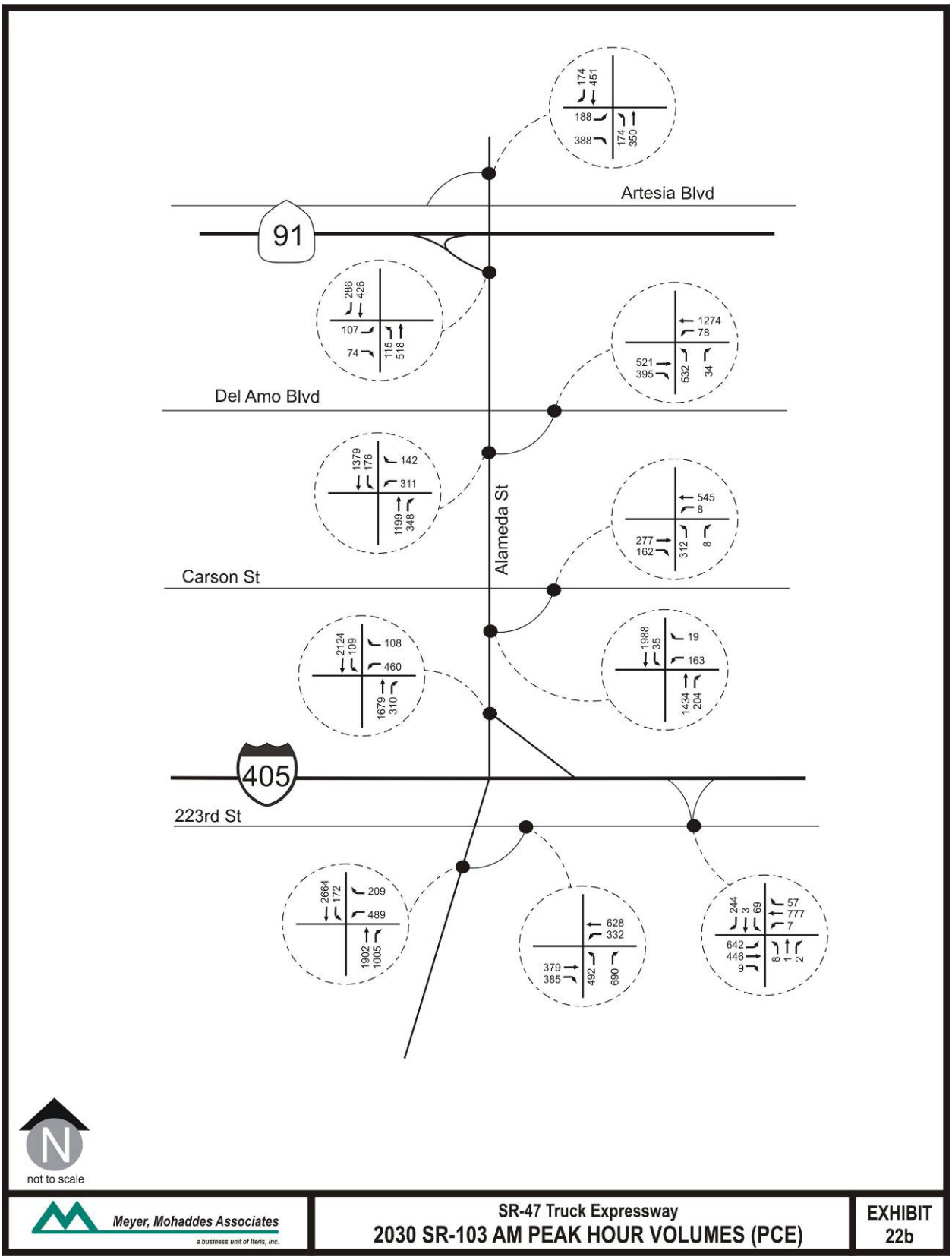


Meyer, Mohaddes Associates
a business unit of Iteris, Inc.

SR-47 Truck Expressway
2030 alt 2 - SR-47 MAINLINE & RAMP VOLUMES

EXHIBIT 21


Sepulveda Blvd
Pacific Coast Hwy
Anaheim St
New Dock St
Alameda St
Henry Ford Ave
103
47
not to scale
Meyer, Mohaddes Associates
a business unit of Iteris, Inc.
SR-47 Truck Expressway
2030 SR-103 AM PEAK HOUR VOLUMES (PCE)
EXHIBIT
22a


Artesia Blvd
91
Del Amo Blvd
Carson St
Alameda St
405
223rd St
174
451
188
388
174
350
286
426
107
74
115
518
1274
78
521
395
532
34
1379
176
142
311
1199
348
545
8
277
162
312
8
2124
109
108
460
1679
310
1988
35
19
163
1434
204
2664
172
209
489
1902
1005
628
332
379
385
492
690
244
3
69
57
777
7
642
446
9
8
1
2
not to scale
Meyer, Mohaddes Associates
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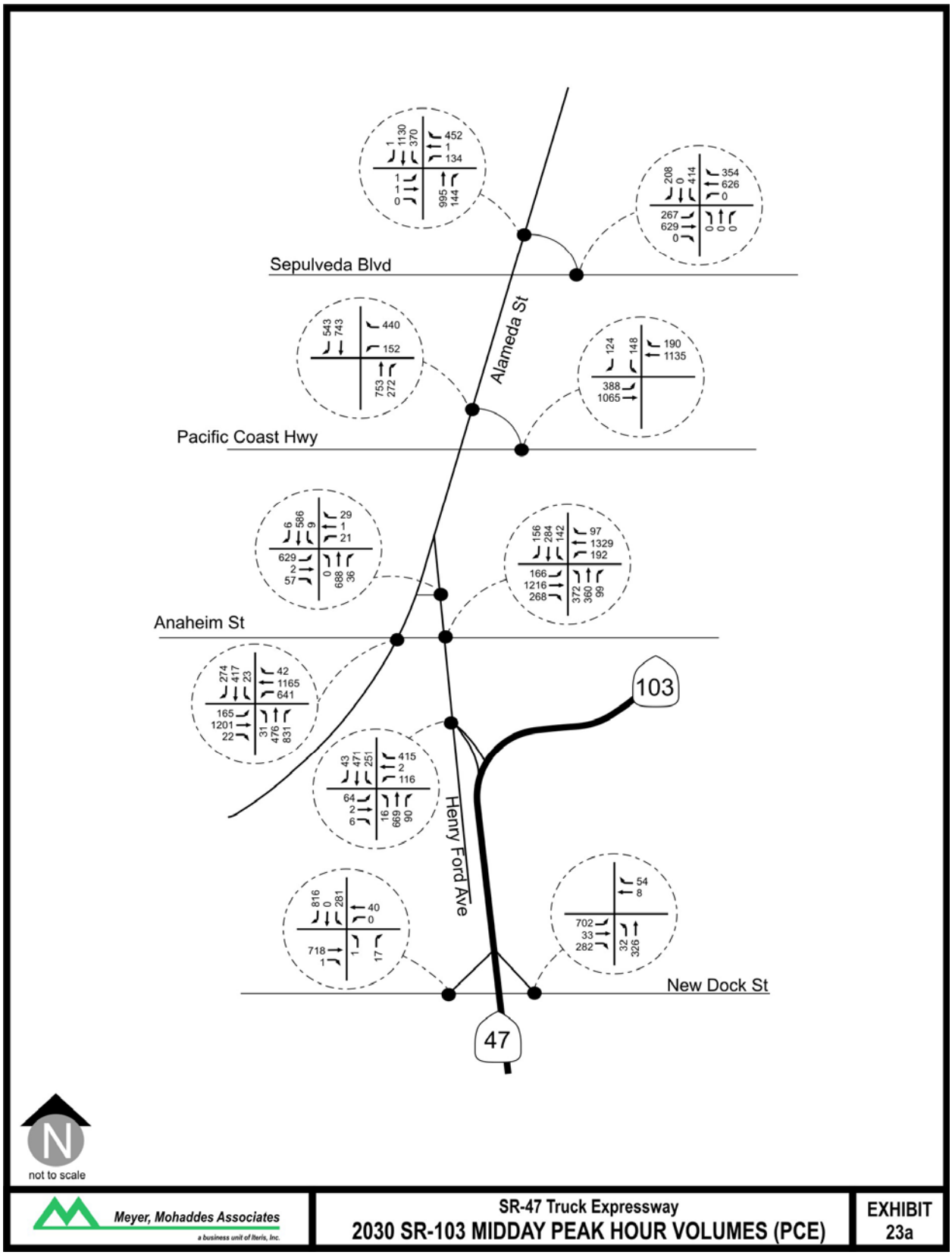
SR-47 Truck Expressway
2030 SR-103 AM PEAK HOUR VOLUMES (PCE)
EXHIBIT
22b



Meyer, Mohaddes Associates
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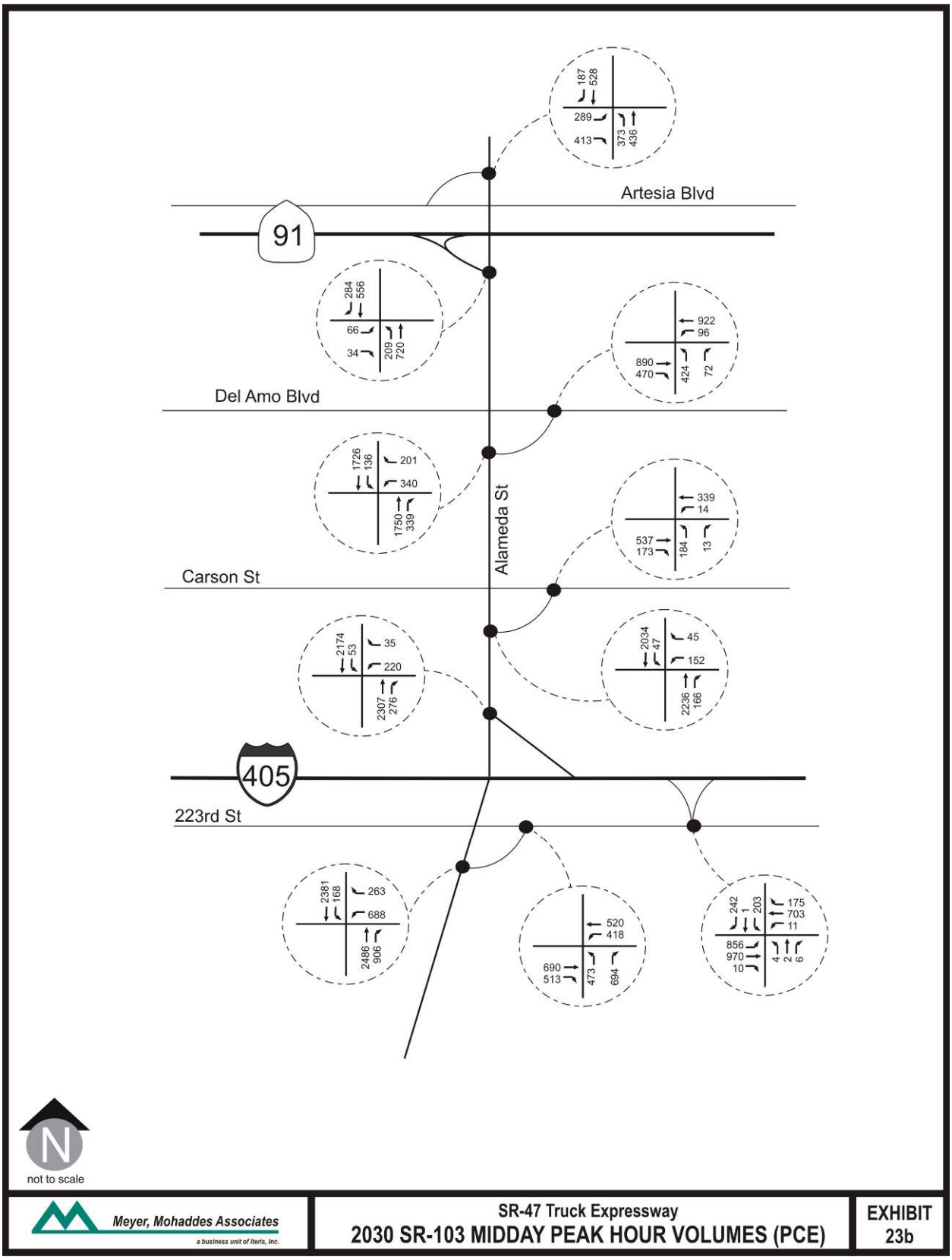
SR-47 Truck Expressway
2030 SR-103 MIDDAY PEAK HOUR VOLUMES (PCE)

EXHIBIT 23a


Artesia Blvd
91
Del Amo Blvd
Carson St
Alameda St
405
223rd St
187
528
289
413
373
436
284
556
66
34
209
720
922
96
890
470
424
72
1726
136
201
340
1750
339
339
14
537
173
184
13
2174
53
35
220
2307
276
2034
47
45
152
2236
166
2381
168
263
688
2486
906
520
418
690
513
473
694
242
1
203
175
703
11
856
970
10
4
2
6
not to scale
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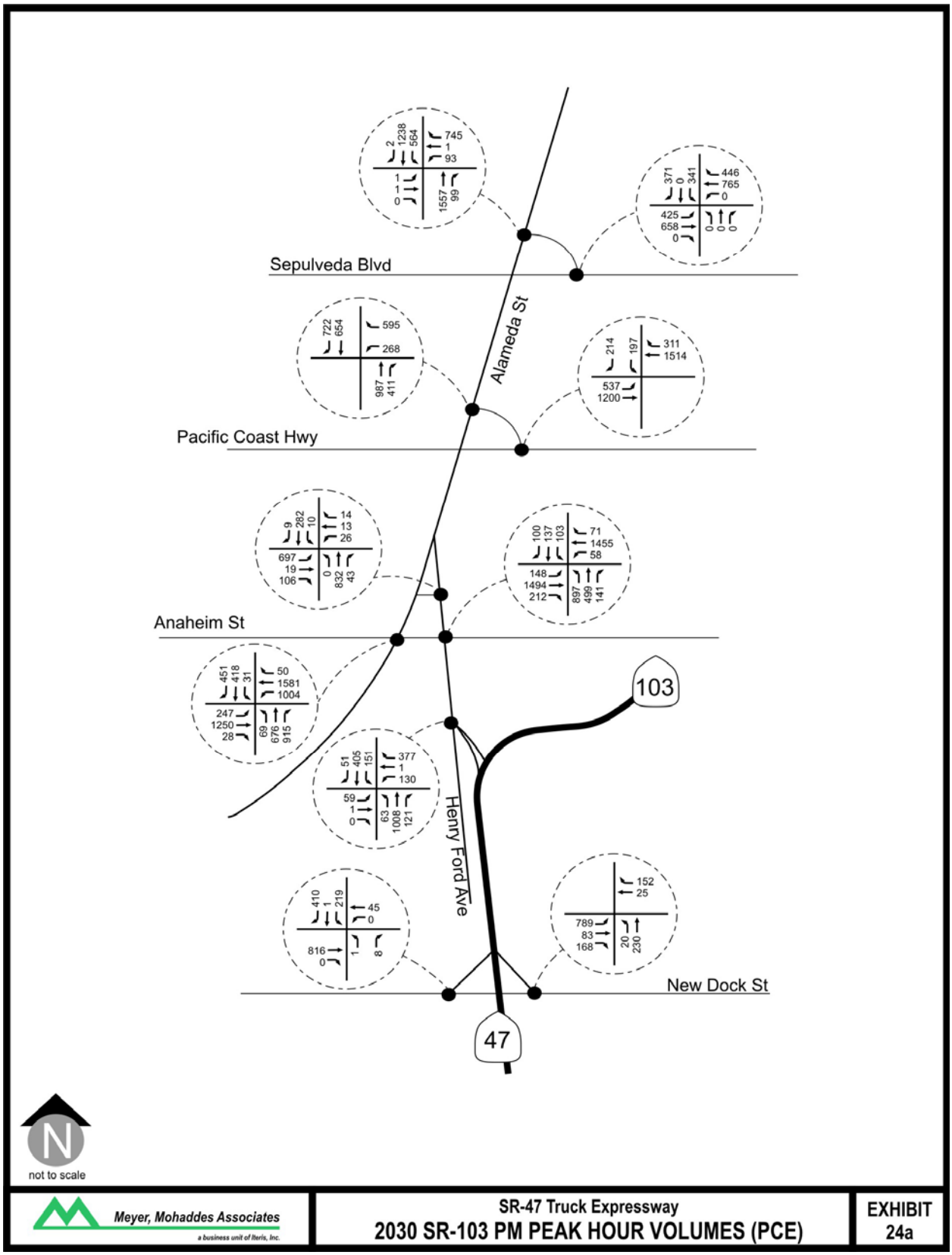
SR-47 Truck Expressway
2030 SR-103 MIDDAY PEAK HOUR VOLUMES (PCE)
EXHIBIT
23b



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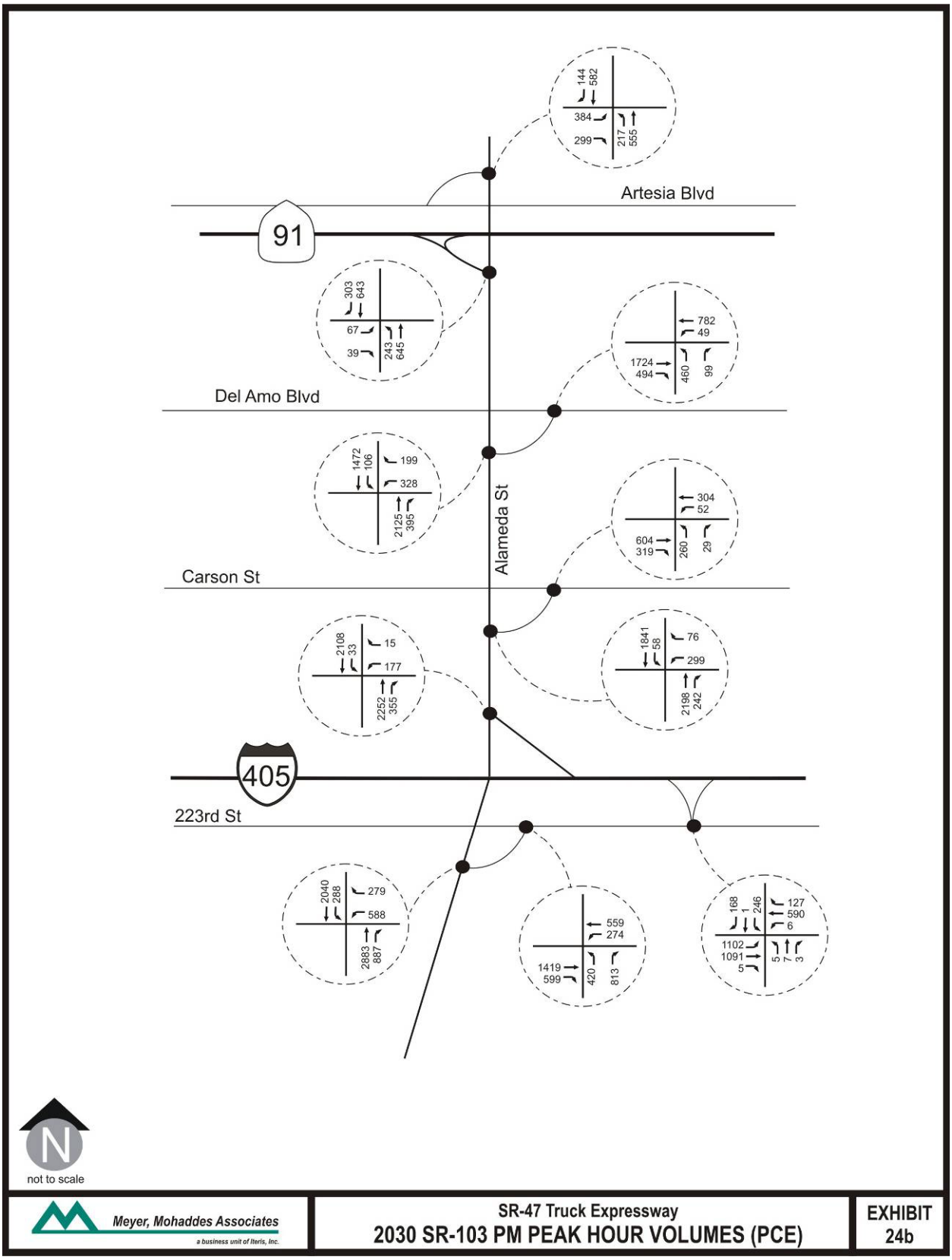
SR-47 Truck Expressway
2030 SR-103 PM PEAK HOUR VOLUMES (PCE)

EXHIBIT 24a



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SR-47 Truck Expressway
2030 SR-103 PM PEAK HOUR VOLUMES (PCE)

EXHIBIT 24b

Intersection Levels of Service

Tables 13, 14 and 15 summarize the 2030 Alternative 2 AM, Mid-day and PM peak hour levels of service at the intersections in the study area and compare the future with Alternative 2 to the base condition without the project. The levels of service calculation sheets are provided in the Appendix. As the data in the tables indicate, the Alternative 2 does not result in any significant impacts at the study intersections with the exception of the Alameda Street and 223rd Street connector ramp under the existing intersection geometrics during the all peak hours. The SR-47/Ocean Boulevard/Henry Ford Avenue interchange is not included in the table, and the results for that location are presented separately in subsequent sections of the report.

In order to mitigate the impact of additional traffic on the Alameda Street and 223rd Street connector ramp intersections, geometric improvements are made to the intersections as part of the project. A detail traffic operation analysis using Synchro is performed to evaluate the traffic operation of the intersections with the proposed improvements and results are presented in Table 16. As results indicate the intersections would operate at LOS D or better. The SYNCHRO analysis is provided in Appendix.

Results at other Study intersections are similar to Alternative 1, with no significant impacts at any other location.

Table 13 - 2030 Alternative 2 AM Peak Intersection Conditions

Intersection	Base		Alternative 2		
	Volume / Capacity or Delay	LOS	Volume / Capacity or Delay	LOS	Change
SR-47 & New Dock SB Off-Ramp[1]	35.8	E	28	D	-7.8
SR-47 & New Dock NB On-Ramp[1]	15.8	C	13.6	B	-2.2
SR-47 & Henry Ford Ramps	31.4	D	15.8	C	-10.4
Henry Ford Ave & Anaheim St	0.991	E	0.86	D	-0.131
Henry Ford Ave & Denni St	0.54	A	0.431	A	-0.109
Alameda St & Anaheim St	0.822	D	0.802	D	-0.02
Alameda St / PCH Connector Ramp n/o PCH	1.266	F	0.494	A	-0.772
PCH / Alameda St Connector Ramp e/o Alameda St	1.001	F	0.748	C	-0.253
Alameda St / Sepulveda Blvd Connector Ramp n/o Sepulveda	1.011	F	0.739	C	-0.272
Sepulveda Blvd / Alameda St Connector Ramp e/o Alameda St	0.781	C	0.757	C	-0.024
Alameda St / 223rd St Connector Ramp s/o 223rd St[2]	0.857	D	1.169	F	0.312
223rd St / Alameda St Connector Ramp e/o Alameda St[2]	0.62	B	0.754	C	0.134
223rd St & I-405 SB Ramps	0.552	A	0.622	B	0.07
Alameda St & I-405 NB Ramps	0.691	B	0.865	D	0.174
Alameda St / Carson St Connector Ramp s/o Carson St	0.469	A	0.502	A	0.033
Carson St / Alameda St Connector Ramp e/o Alameda St	0.403	A	0.41	A	0.007
Alameda St / Del Amo Blvd Connector Ramp s/o Del Amo	0.611	B	0.55	A	-0.061
Del Amo Blvd / Alameda St Connector Ramp e/o Alameda St	0.676	B	0.537	A	-0.139
Alameda St & SR-91 EB Ramps	0.263	A	0.255	A	-0.008
Alameda St & Artesia Blvd n/o Artesia Blvd	0.32	A	0.353	A	0.033

1. Unsignalized intersection – analyzed using HCM delay based methodology.
2. Analysis is based on the existing intersection geometrics.

Table 14 - 2030 Alternative 2 MD Peak Intersection Conditions (PCE)

Intersection	Base		Alternative 2		
	Volume / Capacity or Delay	LOS	Volume / Capacity or Delay	LOS	Change
SR-47 & New Dock SB Off-Ramp[1]	68.8	F	18.9	C	-49.9
SR-47 & New Dock NB On-Ramp[1]	29.5	D	15.6	C	-13.9
SR-47 & Henry Ford Ramps	75.5	F	17.6	C	-41.6
Henry Ford Ave & Anaheim St	1.073	F	0.872	D	-0.201
Henry Ford Ave & Denni St	0.778	C	0.725	C	-0.053
Alameda St & Anaheim St	1.095	F	1.028	F	-0.067
Alameda St / PCH Connector Ramp n/o PCH	1.357	F	0.475	A	-0.882
PCH / Alameda St Connector Ramp e/o Alameda St	0.949	E	0.686	B	-0.263
Alameda St / Sepulveda Blvd Connector Ramp n/o Sepulveda	1.16	F	0.659	B	-0.501
Sepulveda Blvd / Alameda St Connector Ramp e/o Alameda St	0.909	E	0.786	C	-0.123
Alameda St / 223rd St Connector Ramp s/o 223rd St[2]	0.993	E	1.394	F	0.401
223rd St / Alameda St Connector Ramp e/o Alameda St[2]	0.639	B	0.853	D	0.214
223rd St & I-405 SB Ramps	0.7	C	0.709	C	0.009
Alameda St & I-405 NB Ramps	0.711	C	0.796	C	0.085
Alameda St / Carson St Connector Ramp s/o Carson St	0.64	B	0.621	B	-0.019
Carson St / Alameda St Connector Ramp e/o Alameda St	0.432	A	0.388	A	-0.044
Alameda St / Del Amo Blvd Connector Ramp s/o Del Amo	0.724	C	0.672	B	-0.052
Del Amo Blvd / Alameda St Connector Ramp e/o Alameda St	0.577	A	0.561	A	-0.016
Alameda St & SR-91 EB Ramps	0.358	A	0.323	A	-0.035
Alameda St & Artesia Blvd n/o Artesia Blvd	0.543	A	0.559	A	0.016

1. Unsignalized intersection – analyzed using HCM delay based methodology.
2. Analysis is based on the existing intersection geometrics.

Table 15 - 2030 Alternative 2 PM Peak Intersection Conditions (PCE)

Intersection	Base		Alternative 2		
	Volume / Capacity or Delay	LOS	Volume / Capacity or Delay	LOS	Change
SR-47 & New Dock SB Off-Ramp[1]	15.6	C	13.3	B	-2.3
SR-47 & New Dock NB On-Ramp[1]	37.1	E	17.3	C	-19.8
SR-47 & Henry Ford Ramps	139.6	F	37.6	E	-77.9
Henry Ford Ave & Anaheim St	1.167	F	1.034	F	-0.133
Henry Ford Ave & Denni St	0.812	D	0.825	D	0.013
Alameda St & Anaheim St	1.122	F	1.112	F	-0.01
Alameda St / PCH Connector Ramp n/o PCH	1.367	F	0.671	B	-0.696
PCH / Alameda St Connector Ramp e/o Alameda St	1.024	F	0.942	E	-0.082
Alameda St / Sepulveda Blvd Connector Ramp n/o Sepulveda	1.296	F	1.011	F	-0.285
Sepulveda Blvd / Alameda St Connector Ramp e/o Alameda St	1.008	F	0.967	E	-0.041
Alameda St / 223rd St Connector Ramp s/o 223rd St[2]	1.093	F	1.497	F	0.404
223rd St / Alameda St Connector Ramp e/o Alameda St[2]	0.901	E	1.068	F	0.167
223rd St & I-405 SB Ramps	0.683	B	0.776	C	0.093
Alameda St & I-405 NB Ramps	0.711	C	0.757	C	0.046
Alameda St / Carson St Connector Ramp s/o Carson St	0.697	B	0.691	B	-0.006
Carson St / Alameda St Connector Ramp e/o Alameda St	0.562	A	0.543	A	-0.019
Alameda St / Del Amo Blvd Connector Ramp s/o Del Amo	0.792	C	0.757	C	-0.035
Del Amo Blvd / Alameda St Connector Ramp e/o Alameda St	0.678	B	0.615	B	-0.063
Alameda St & SR-91 EB Ramps	0.333	A	0.368	A	0.035
Alameda St & Artesia Blvd n/o Artesia Blvd	0.502	A	0.505	A	0.003

1. Unsignalized intersection – analyzed using HCM delay based methodology.
2. Analysis is based on the existing intersection geometrics

Table 16 – Alternative 2 - Alameda Street/223rd Street Traffic Operation Analysis Results

Intersection		AM Peak		Cycle Length (sec.)	MD Peak		Cycle Length (sec.)	PM Peak		Cycle Length (sec.)
		LOS	Delay (sec.)		LOS	Delay (sec.)		LOS	Delay (sec.)	
1	Alameda St / 223rd St Connector Ramp s/o 223rd St	B	15.5	120	C	22.1	120	D	37.7	120
2	223rd St / Alameda St Connector Ramp e/o Alameda St	C	22.4	120	C	26.8	120	D	39.7	120

SR-47/Ocean Boulevard/Henry Ford Avenue Interchange Analysis

The results of the Synchro analysis of SR-47/Ocean Boulevard/Henry Ford Avenue interchange are summarized in the table below. The results indicate that Alternative 2 is expected to improve the LOS at SR-47/Henry Ford Avenue. It also improves the average delay at SR-47/Ocean Boulevard intersection.

The worst level of service for the two intersections is LOS E; however, certain movements are shown to be LOS F based on the Synchro analysis.

Table 17 - 2030 Alternative 2 SR-47/Ocean Boulevard/Henry Ford Avenue Interchange Analysis Results

Scenario	Time Period	Average Intersection Delay		Overall Intersection Level of Service	
		Henry Ford	Ocean Blvd	Henry Ford	Ocean Blvd
Base	**AM**	41.5	69.2	D	E
	Mid-day	45.0	77.2	D	E
	PM	36.6	50.8	D	D
SR-103 Extension	**AM**	26.0	46.8	C	D
	Mid-day	25.6	55.3	C	E
	PM	27.1	46.6	C	D

ALTERNATIVE 5 – TRANSPORTATION SYSTEMS MANAGEMENT (TSM) ALTERNATIVE

The Transportation Systems Management (TSM) Alternative is designed to identify low-cost, easily implementable improvements as an alternative to construction of more-expensive improvements. For this project, the TSM alternative focuses on improvements to routes that parallel the proposed SR-47 Expressway, and that serve the same trips, including trucking drayage trips to and from the Intermodal Container Transfer Facility, and trips destined to and from the Ports via Alameda Street, Henry Ford Avenue and SR-47. In addition, trip reductions via travel demand management (TDM) techniques are sometimes employed as part of the TSM alterative. TDM measures, if feasible, would reduce travel demand in the corridor and potentially lessen the need for improvements. The TSM alternative would include measures to improve capacity and traffic circulation at the Port of Long Beach and Port of Los Angeles through policy changes and use of the latest technologies. The TSM alternative for this project includes the following key elements:

- Intelligent Transportation Systems (ITS) systems applications in and around the port area, with special emphasis on truck movements.
- Lower-cost intersection improvements such as restriping to provide additional turn lanes and acceleration lanes where needed, and traffic signalization improvements.
- Minor roadway widening and/or peak hour parking prohibitions to remove mid-block bottlenecks along selected roadways.

The elements of the TSM alternative are described in more detail below.

Intelligent Transportation Systems Elements (Advanced Transportation management and Information System – ATMIS and Advanced Traveler Information Systems – ATIS) - The planned ITS improvements are designed to improve traffic circulation through traffic control, incident management, traffic surveillance, traffic information dissemination with the aid of intelligent transportation system devices and systems. There is currently an $8+ million project to install an intelligent transportation system (ITS) in the port area.

An advanced detection system for trains approaching the rail crossings between the Henry Ford Avenue/SR-47 interchange and Anaheim Street is under construction so that train blockages of those tracks would be detected in advance and during the blockage. The train detection portion of the system was installed as part of the railroad signal system. Three Changeable Message Signs are under construction at Anaheim Street/Henry Ford Avenue. The railroad system will send the traffic information to the LADOT Traffic Management Centre (ATSAC), which will control the CMS message. That information would be used to direct truck and auto traffic to routes without blockages, including SR-47/SR-103, I-710, I-110, Sepulveda Boulevard, Pacific Coast Highway and Anaheim Street.

The focus of the Advanced Transportation Management and Information System (ATMIS) element is the application of proven ITS technologies within and in the vicinity of the project area. Truckers, dispatchers, terminal operators, traffic engineers, system operators, and others

will be provided with traffic surveillance at critical points to better assist travel, minimize rail blockage delays, manage incidents and efficiently divert truck traffic to various entrance and exit points.

ATMIS will control ITS field elements, monitor traffic signals, and monitor rail traffic with a link to the City of Long Beach Traffic Management Center (TMC), the Caltrans Traffic Operation Center (TOC), and to future envisioned TMCs in the South Bay area. The ATMIS will also have an indirect link to the City of Los Angeles ATSAC center via another Port of Long Beach project and as noted above, an advance warning system for an at grade rail crossing of tracks. Specific elements are described below.

Expansion of Long Train Warning System - The long train warning system could be expanded to Alameda Street between Anaheim Street and Pacific Coast Highway as well as synchronizing the crossing of short trains of Henry Ford/Alameda Street with the traffic signal systems.

Closed Circuit Television Surveillance -The deployment of CCTV would focus mainly at strategic locations so that the operation of each location can be visually monitored. Once surveillance of the identified locations is achieved, the engineer would be able to identify incidents and/or congested locations and redirect traffic using other elements, such as Changeable Message Signs (CMS). For example, CMS might be placed on Ocean Boulevard, Seaside Avenue, and SR-47 near the Schuyler Heim Bridge. CMS may also be placed near selected terminal entrance/exit locations, as described below.

Changeable Message Signs (CMS) - A key element of application of Changeable Message Signs is to effectively use any available roadway capacities on alternative routes in the event of blockages and delays. The CMS will provide the motorist with real-time notice of long trains, slow traffic and queuing ahead, thus allowing them to choose an alternative route if the alternative route will reduce the delay time.

In addition to the Changeable Message Signs to be installed under the ATMIS project, six signs will be installed under the Ports Incident Management System funded by the Department of Homeland Security. The locations are: southbound Alameda Street north of Pacific Coast Highway, southbound Terminal Island Freeway north of Pacific Coast Highway, eastbound Ocean Boulevard east of SR-47, westbound Seaside Boulevard east of the Ocean Boulevard/TI Freeway Interchange, southbound I-710 near Spring Street and on southbound I-110 south of Torrance Boulevard. Another potential location for future CMS would be at the northbound SR-47 off ramp that could alert motorist to long trains crossing Henry Ford Avenue or Alameda Street.

The CMS under construction by ACTA and other CMS as part of the Port of Long Beach project would advise the motorist of train crossings. The motorist then could choose an alternative path. The effectiveness of the CMS system is dependent on the available roadway capacity. As the congestion grows on alternative routes, many motorists may not choose to use the alternative routes. For example, by 2030, it is forecasted that Port truck traffic trips to increase by approximately 200 percent and sub-regional auto volumes will also be significantly increased (by approximately 25 percent) due to growth in San Pedro, Long Beach and surrounding

communities. Such an increase in traffic volumes will consume most of the available of roadway capacity on alternative routes such as I-710, I-110, SR-103 and arterial streets in the vicinity of Henry Ford Avenue, especially during the AM, Mid-day and PM peak periods. Many of those routes will be operating at level of service F conditions in the future. This increase in the general level of congestion would diminish the effectiveness of the CMS system in future years and specifically by the horizon year of 2030.

Detailed and quantitative analysis of the potential effectiveness of such systems, such as the number of motorists that will be diverted, and the locations that they will be diverted to, is not feasible for several reasons. First, it cannot be predicted with certainly how much diversion will occur, or the specific routes that would be used by motorists. It has been Caltrans recent practice to not specify which routes to use on CMS indications, but instead to provide information to motorists simply warning of the delays themselves. Second, while CMS would be very useful during the construction period to avoid congestion and delay, their effectiveness in the future may be limited by high levels of congestion that will be experienced on the alternative routes.

It is acknowledged that CMS will still provide valuable real time information to motorists even in future years, however the effectiveness will be limited by the lack of available alternative routes with excess capacity. Additionally, such a system would be useful as a mitigation measure during construction period for the SR-47 and also I-710. It must be recognized, however, that the use of CMS will not provide increased traffic carrying capacity to and from the Ports, will not provide significant relief for the study corridor when the alternative routes are themselves highly congested, and the level of diversion cannot be predicted with any level of certainly given the unknowns of driver behavior and lack of attractive routes with capacity.

Link to Long Beach TMC, Caltrans TOC, future South Bay TMCs, and LADOT ATSAC Center
These links will exchange traffic signal operation and traffic information with the Ports' ATMS and provide opportunity to monitor the traffic in the project area.

The Advanced Traveler Information System (ATIS) - will provide information in-vehicle and at kiosks and other locations to assist truckers and other motorists within and in proximity of ports. This information could include route congestion data, rail blockage data and other traveler information.

In addition to these considerations, other TSM measures, such as minor roadway improvements, widening and restriping may help provide improve traffic levels of service in the study corridor. Analogous to the CMS improvements, these improvements would not provide significant increases in capacity or reduce motorist delay in the longer-term future due to the significant level of congestion that is expected on all roadways leading to and from the Ports.

Roadway and Intersection Improvements

The TSM alternative includes minor physical improvements at intersections and along roadways, primarily within existing rights-of-way. Due to recent Port Access Demonstration Program improvements, many of the local intersections have already been improved in the past few years,

and Alameda Street itself has been significantly improved via widening and grade separations. One improvement would be to stripe Alameda Street to the full six lane cross section for through traffic (it is currently striped as four lanes), eliminating parking and providing two additional lanes for travel. Intersections to be improved would include the SR-103 Freeway where it terminates at Sepulveda Boulevard, as well as intersections along Henry Ford Avenue north of SR-47, along Anaheim Street between SR-103 and Alameda Street and along Pacific Coast Highway between SR-47 and Alameda Street.

Travel Demand Management (TDM) - Travel demand between Terminal Island and the mainland is largely a function of port activities and, as such, there are limited opportunities to utilize TSM tools to reduce travel demand. One opportunity, to maximize the use of rail rather than trucks to transport shipping containers, is currently being implemented throughout the ports. However, a complete shift from truck to rail for container transport is not possible because the destinations of the containers are not all located along rail corridors. Also, approximately 50 percent of the import cargo is for local (not intermodal) destinations, so by definition those will continue to move via truck. Also, the TDM activities would not result in the increased ability of the Schuyler Heim Bridge to withstand an MCE.
In addition, in the event of a major earthquake that would render the Schuyler Heim Bridge unusable, there are only two other access routes to and from Terminal Island, assuming these routes would be viable following the earthquake. Because road travel to and from Terminal Island is a function of port activities, and because there are only three bridges that provide access to the island, in the event of a major earthquake that would render the Schuyler Heim Bridge unusable, a TSM alternative would not be effective in reducing roadway demand or in redirecting Terminal Island traffic to other routes.

Because this alternative would not result in physical improvement to or replacement of the Schuyler Heim Bridge, it: (1) would not provide a link from the mainland to Terminal Island that would ensure ground and vessel transportation immediately following an MCE, (2) would not provide for safety improvements for bridge traffic, (3) would not improve operational or design features of the bridge, and (4) would not minimize future maintenance and operational costs of the Schuyler Heim Bridge.

SR 47 EXPRESSWAY/PCH INTERSECTION TRAFFIC OPERATION ANALYSIS

The following section presents the results of the operational analysis of the Alameda Street between lower PCH (PCH under the grade separation structure) and "O" Street for Alternative 1. The evaluation is intended to understand the operational impacts of traffic growth on the SR-47/Alameda/O Street weaving segment due to the proposed Truck Expressway. The key issue that is addressed is the operational characteristics of the segment of Alameda street between where the SR-47 Expressway would join and the intersection of Alameda Street and "O" Street.

The evaluation consists of the development of a Synchro traffic analysis model to optimize the signal timing and offsets. A model was then developed using CORSIM software to perform a micro-simulation model to evaluate the impacts of weaving vehicles. The approach delay from CORSIM was used to calculate the overall intersection delay and level-of-service with a spreadsheet using Highway Capacity Manual (HCM) methodology.

The traffic analysis and simulation models were developed for the AM, mid-day and PM peak hour conditions for future Year 2030 traffic volumes from the updated Port Transportation Model. The study includes the following two intersections:

- Alameda Street and Lower PCH
- Alameda Street and "O" Street

The project includes the elimination of the southbound left turns from Alameda Street to O Street by constructing a direct ramp from Alameda Street southbound to PCH. For the proposed configuration, morning, afternoon and midday peaks were analyzed. The levels-of-service for the study intersections are summarized in Table 18. The morning, afternoon and midday peaks operate at intersection LOS of C or better.

Table 18 - Level-of-Service Summary

Intersection	AM Peak Hour	Midday Peak Hour	PM Peak Hour
Alameda/SR-47/Lower PCH	B	B	C
Alameda/O Street	B	C	C

The proposed elimination of the southbound left turn lane at Alameda Street and O Street would result in acceptable level of service for all three peak hours. The average link speed northbound on Alameda between Lower PCH and O Street is projected to be 18.9 mph, 12.4 mph, and 6.3 mph during the three peaks and is summarized in Table 18. The average link speed southbound on Alameda is projected to be 18.9 mph, 19.8 mph and 21.5 mph, also shown in Table 19.

Table 19 - Average Link Speed

Alameda between Lower PCH and O Street	AM Peak Hour	Midday Peak Hour	PM Peak Hour
Northbound	18.9	12.4	6.3
Southbound	18.9	19.8	21.5

Findings

Based on the CORSIM model runs, the intersection of Alameda Street at O Street would result in an acceptable level of service C or better condition with the removal of the southbound left turns and associated vehicle turning movement conflicts. The intersection would operate at a LOS of C or better during the three peak hours. The CORSIM and Synchro model outputs are provided in Appendix.

TRAFFIC ANALYSIS FOR CONSTRUCTION PERIOD CLOSURE OF SCHUYLER HEIM BRIDGE

The following section provides the results of the traffic analysis concerning the expected impact that closing lanes on the existing Schuyler Heim Bridge (for construction of a new bridge) will have on traffic conditions in the vicinity of the planned project. The study area for the construction period analysis is bounded by Ocean Boulevard, Seaside Avenue, and Route 47/Vincent Thomas Bridge to the south; I-110 to the west; Sepulveda Boulevard to the north; and I-710 to the east. The Ports Transportation Model was used to assess traffic volumes along major streets and highways in the study area, with and without the construction closures. For the purpose of this effort, the 2010 Middle Harbor EIR Port model which has the most up-to-date information is used for forecasting the traffic volumes during the construction period.

Port truck traffic is heaviest during Mid-day and PM peak hours, to accommodate the expected directional flow during the peak hours, the Schuyler Heim Bridge is assumed to have two lanes in northbound direction and one lane in the southbound direction during the construction period. Schuyler Heim Bridge capacity and speed during construction of are assumed to be 1,550 passenger cars per hour per lane (pc/h/l) based on Highway Capacity Manual (HCM) 2000 and 25 mph. Reductions in the capacity and speed of the Schuyler Heim Bridge are due to lower lane width and traffic merging activities during the construction period.

Traffic Impacts on Major Routes in Study Area

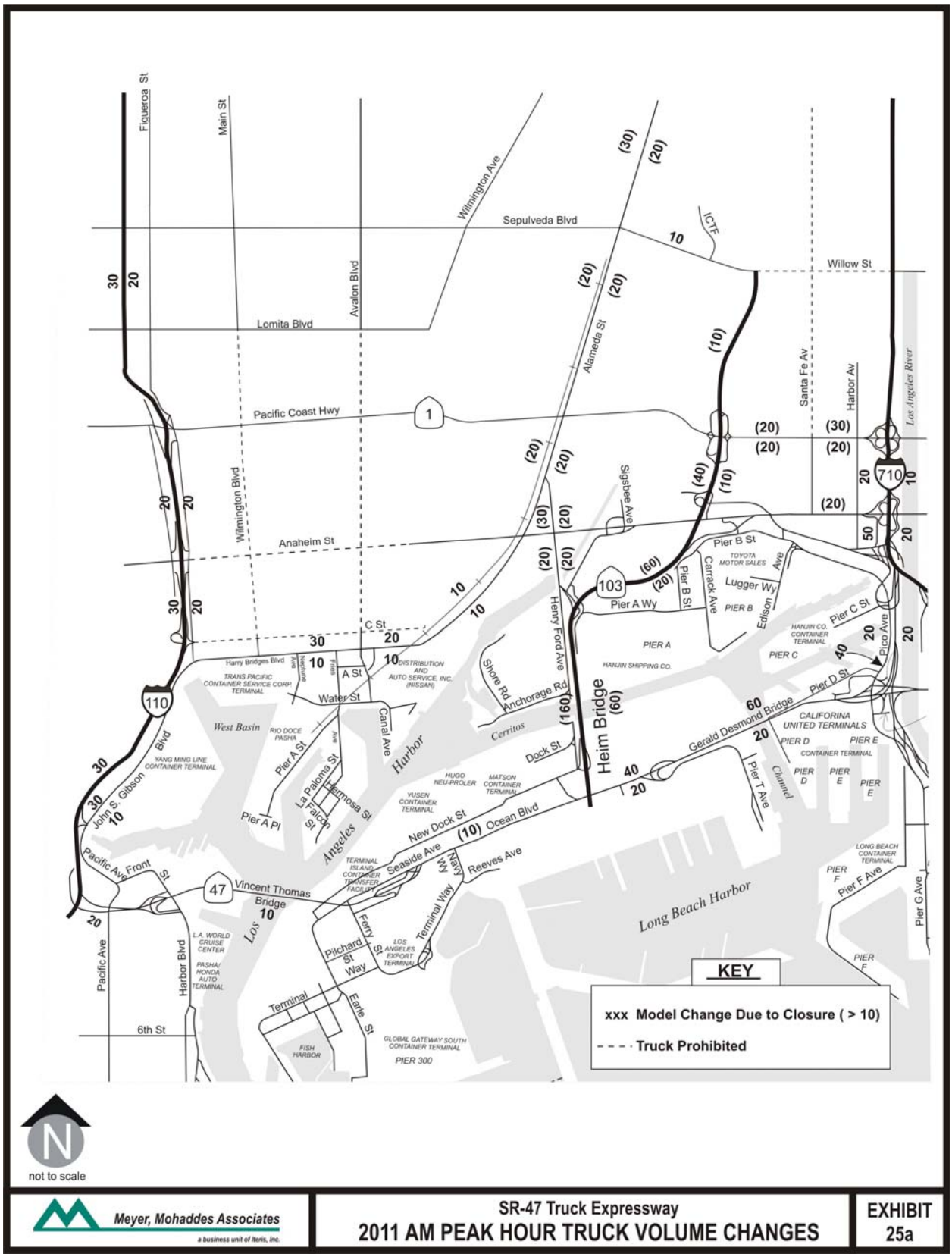
The Schuyler Heim Bridge is located along SR 47/SR 103 approximately 800 meters (½ mile) north of Ocean Boulevard. It is part of a major north-south route that lies between the I-110 and I-710 Freeways and connects the Ports of Long Beach and Los Angeles with the western part of Long Beach (via SR 103), the Wilmington area of Los Angeles and the City of Carson (via Henry Ford Avenue and Alameda Street). In addition to the referenced freeways, other major routes that will be utilized by detoured traffic include SR 47 in the vicinity of the Vincent Thomas Bridge and Ocean Boulevard in the vicinity of the Gerald Desmond Bridge.

To analyze the impact of the traffic closure, forecast traffic volumes due to the bridge closure were generated using the Ports travel demand model. Exhibits 25, 26 and 27 illustrate locations where the change in truck traffic volume is 10 vehicles or more due to the closure during the AM, Mid-day, and PM peak hours, respectively.

The highest diversion of traffic occurs during AM and MD peak hours. As shown in Figure 25, the Schuyler Heim Bridge southbound truck traffic is reduced by 160 trucks with most of traffic being diverted to I-710 and I-110 during the AM peak hour. Majority of trucks on I-110 have chosen their route in advance of the construction area. On the other hand, the trucks on I-710 are avoiding access to Schuyler Heim Bridge from PCH and Anaheim Street and they remain on I-710 to reach the Ports terminals. Similar truck patterns are observed during the Mid-day peak hour. During the PM peak hours where the most of truck traffic is out of the Port, the diversion of traffic is minimal since sufficient capacity exists in northbound direction. The diverted traffic is approximately split 50/50 between I-710 and I-110 during the PM peak hour.

The impact of truck traffic on local streets during construction is minimal as shown in the Exhibits 25-27. Pico Avenue and Alameda street are the only two streets where truck traffic

would increase. The highest truck increase on Pico Avenue and Alameda Street are 40 and 30 trucks, respectively.



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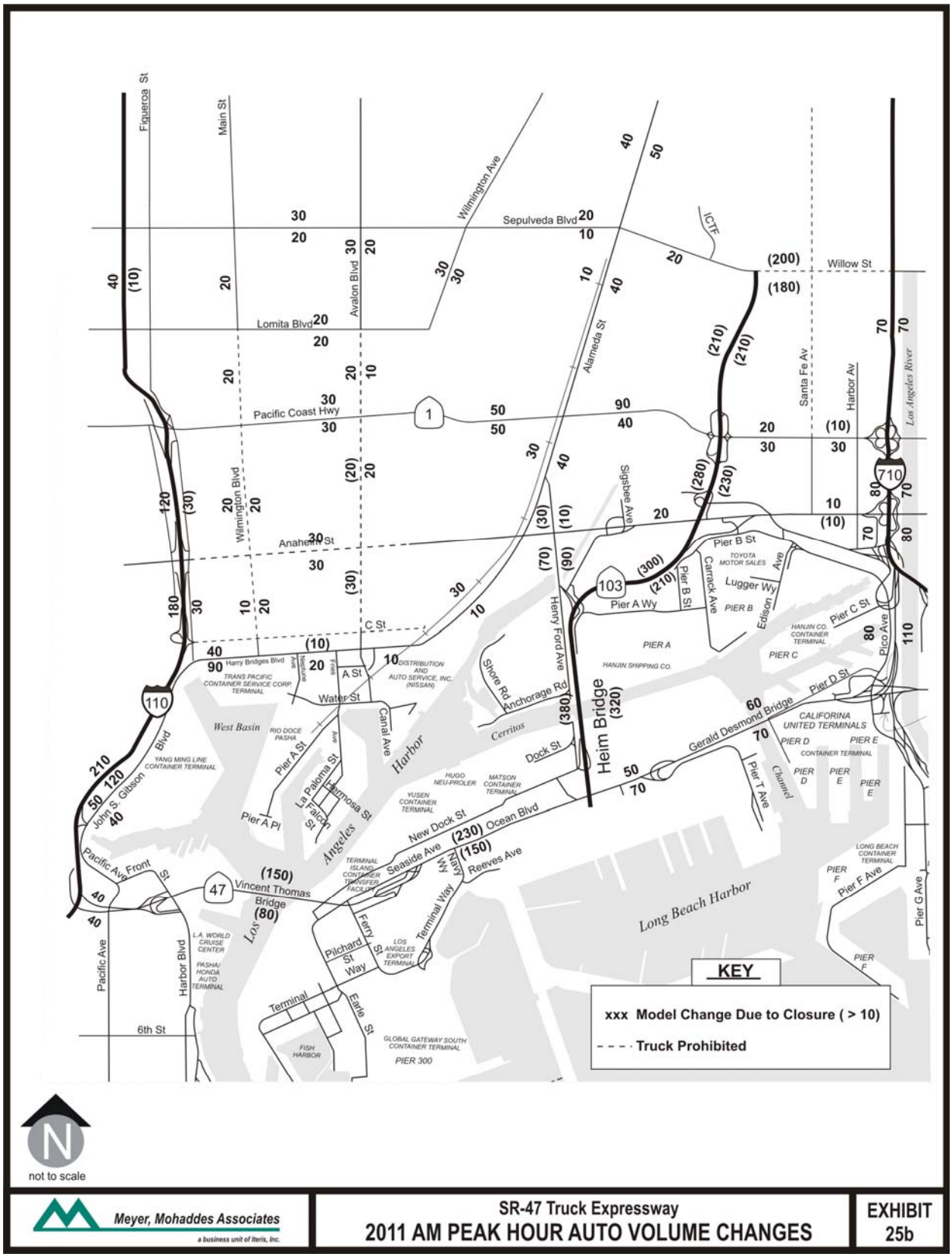
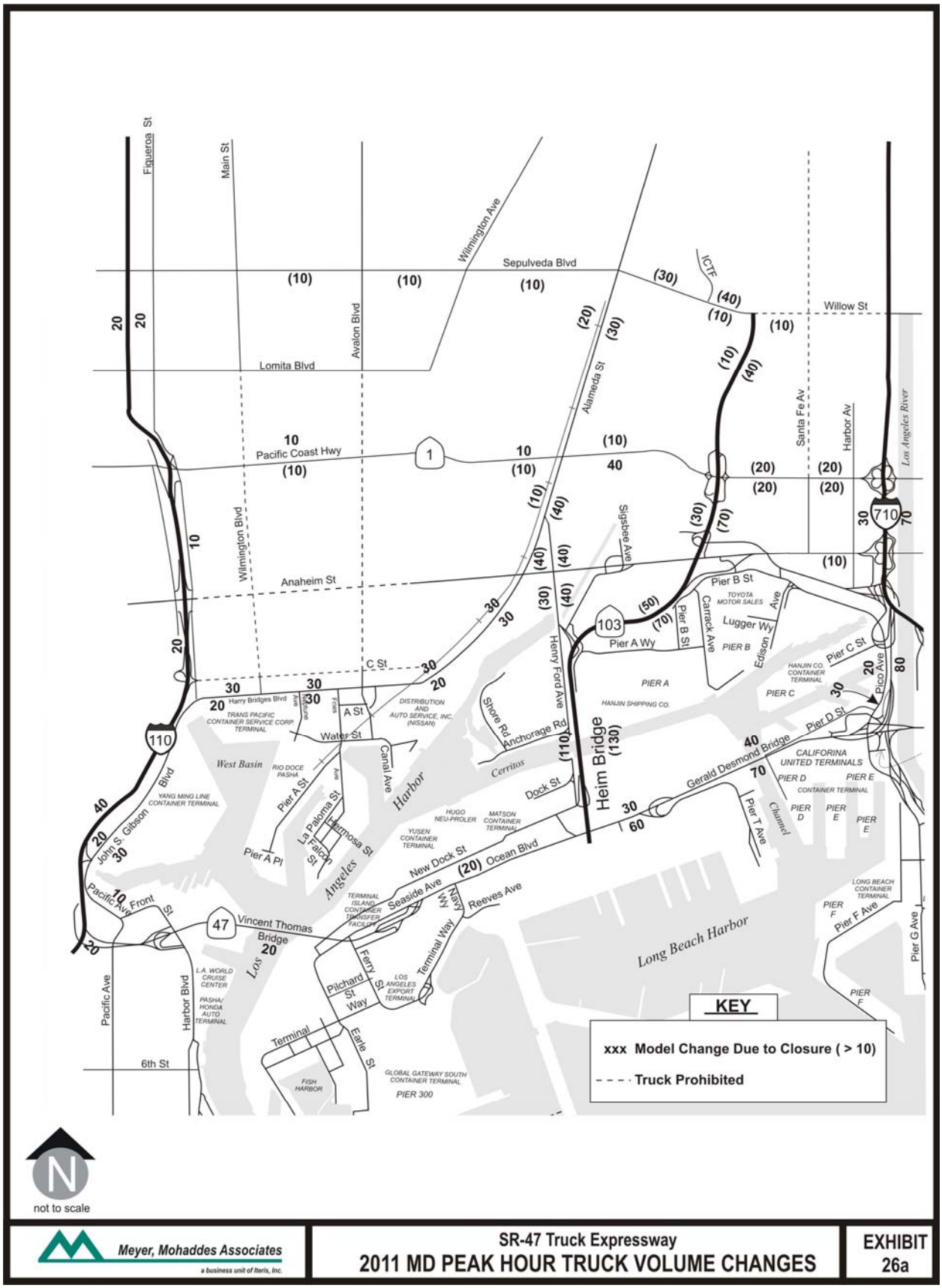
SR-47 Truck Expressway
2011 AM PEAK HOUR TRUCK VOLUME CHANGES

EXHIBIT 25a


KEY
xxx Model Change Due to Closure (> 10)
Truck Prohibited
not to scale
Meyer, Mohaddes Associates
a business unit of Iteris, Inc.
SR-47 Truck Expressway
2011 AM PEAK HOUR AUTO VOLUME CHANGES
EXHIBIT
25b
Figueroa St
Main St
Wilmington Ave
Sepulveda Blvd
ICTF
Willow St
Lomita Blvd
Avalon Blvd
Alameda St
Pacific Coast Hwy
Santa Fe Av
Harbor Av
Los Angeles River
Wilmington Blvd
Sigsbee Ave
Anaheim St
Pier B St
TOYOTA MOTOR SALES
Carrack Ave
Lugger Wy
Edison Ave
Pier A Wy
Pier B St
PIER B
Pier C St
HANJIN CO. CONTAINER TERMINAL
PIER A
PIER C
HANJIN SHIPPING CO.
Pico Ave
C St
Harry Bridges Blvd
TRANS PACIFIC CONTAINER SERVICE CORP TERMINAL
DISTRIBUTION AND AUTO SERVICE, INC. (NISSAN)
A St
Water St
Shore Rd
Anchorage Rd
Henry Ford Ave
Heim Bridge
Pier D St
Gerald Desmond Bridge
CALIFORINA UNITED TERMINALS
PIER D
PIER E
CONTAINER TERMINAL
West Basin
RIO DOCE PASHA
Canal Ave
Harbor
Cerritos
Dock St
YANG MING LINE CONTAINER TERMINAL
Pier A St
La Paloma St
Hermosa St
Falcon St
HUGO NEU-PROLER
MATSON CONTAINER TERMINAL
YUSEN CONTAINER TERMINAL
Pier T Ave
Channel
Pier A Pl
New Dock St
Ocean Blvd
Seaside Ave
Navy Way
Reeves Ave
Pacific Ave
Front St
Vincent Thomas Bridge
TERMINAL ISLAND CONTAINER TRANSFER FACILITY
Los Angeles
Long Beach Harbor
LONG BEACH CONTAINER TERMINAL
Pier F Ave
Pier G Ave
Harbor Blvd
L.A. WORLD CRUISE CENTER
PASHA/ HONDA AUTO TERMINAL
Pilchard St
Ferry St
Terminal Way
LOS ANGELES EXPORT TERMINAL
Terminal
Earle St
6th St
FISH HARBOR
GLOBAL GATEWAY SOUTH CONTAINER TERMINAL
PIER 300



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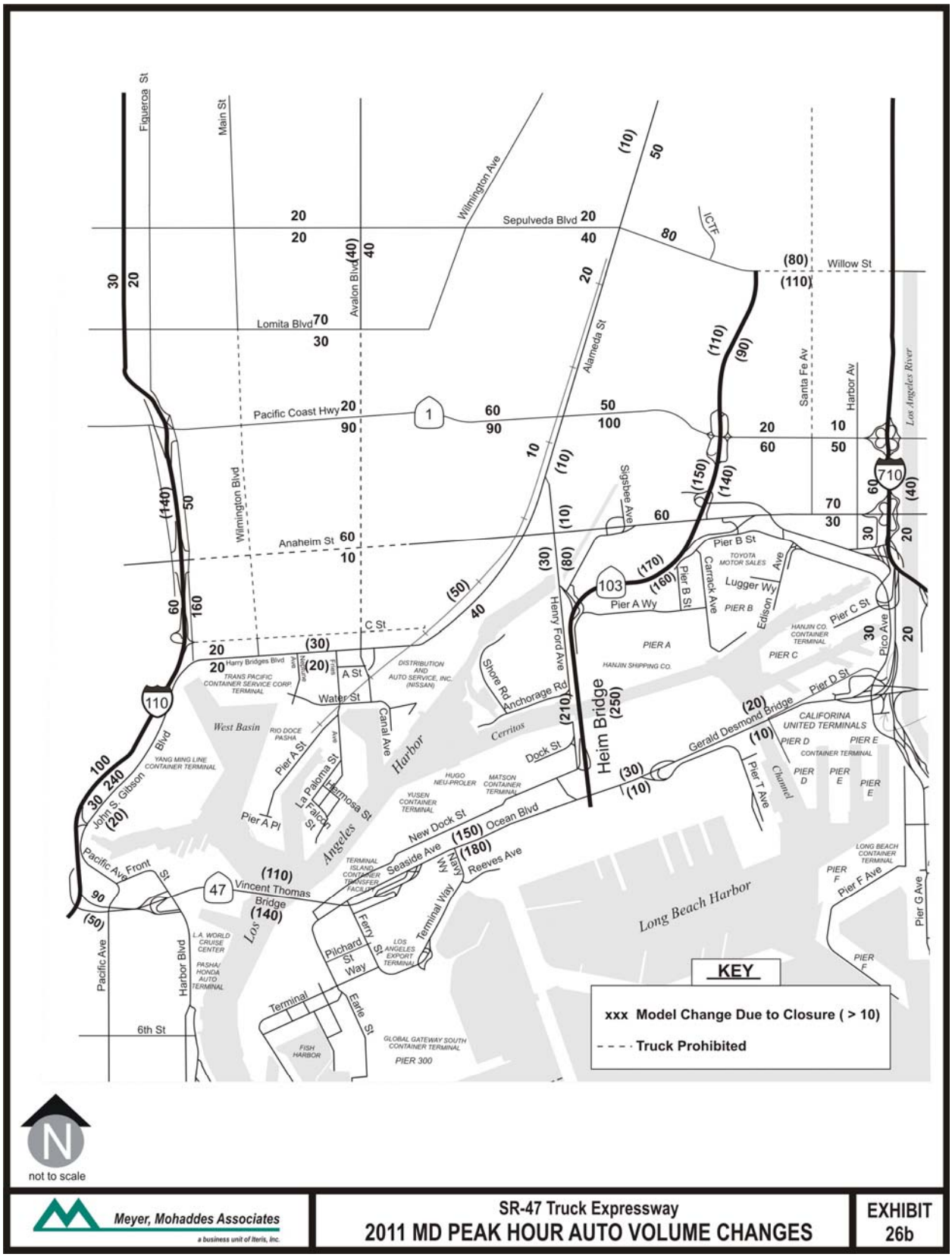
SR-47 Truck Expressway
2011 MD PEAK HOUR TRUCK VOLUME CHANGES

EXHIBIT 26a



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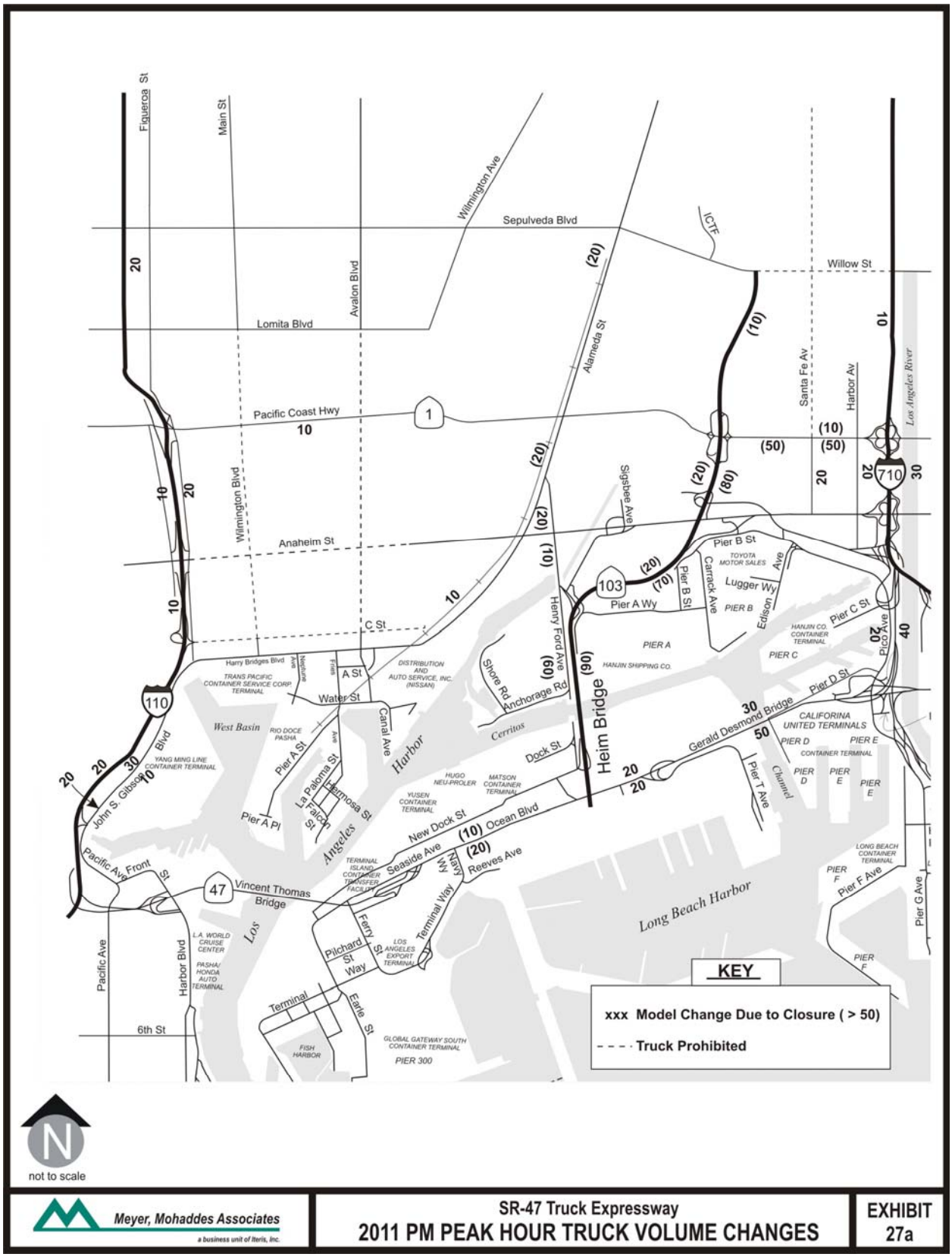
SR-47 Truck Expressway
2011 MD PEAK HOUR AUTO VOLUME CHANGES

EXHIBIT 26b



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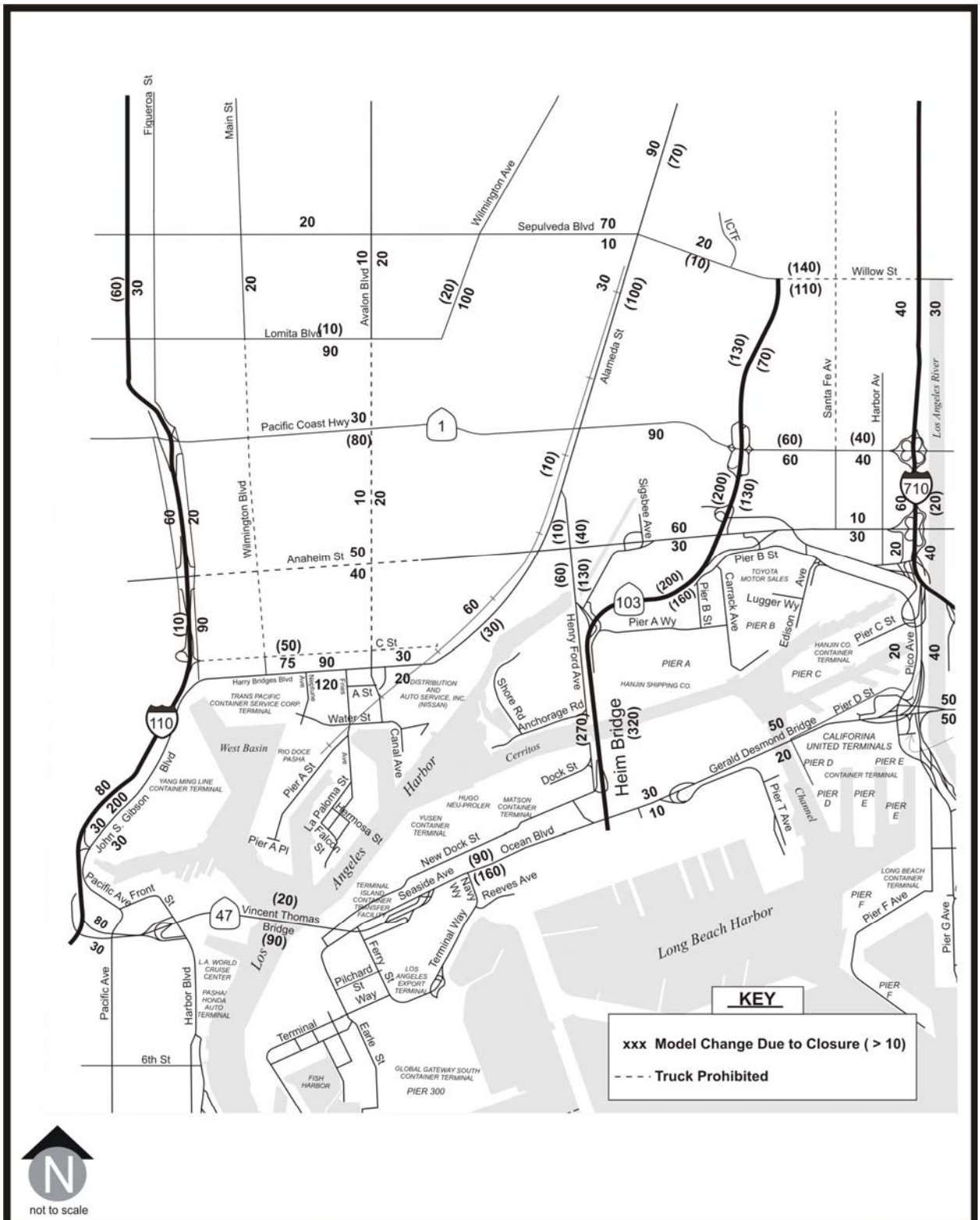
SR-47 Truck Expressway
2011 PM PEAK HOUR TRUCK VOLUME CHANGES

EXHIBIT 27a



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SR-47 Truck Expressway
2011 PM PEAK HOUR AUTO VOLUME CHANGES

EXHIBIT 27b

Schuyler Heim Bridge Operational Analysis

The 2011 forecast peak-hour traffic volumes on the Schuyler Heim Bridge prior to construction and during construction are summarized in Tables 20 and 21.

Table 20 - Forecasted 2011 Pre-Construction Peak-Hour Traffic Volumes

Location	Peak Hour	Northbound			Southbound		
		Auto Traffic	Truck Traffic	Total PCE* Traffic	Auto Traffic	Truck Traffic	Total PCE* Traffic
Heim bridge	AM	560	230	940	830	510	1670
Northbound (3 Lanes)	Midday	630	710	1870	380	580	1350
Southbound (3 Lane)	PM	1120	490	1960	520	210	870
I-710 s/o PCH	AM	3700	1130	5690	3800	1520	6460
Northbound (3 Lanes)	Midday	3140	1660	6100	3620	1510	6320
Southbound (3 Lanes)	PM	4210	1260	6460	4780	810	6250
I-710 Ramps / Ocean Blvd	AM	950	390	1650	320	580	1340
Northbound (2 Lanes)	Midday	560	590	1630	290	590	1350
Southbound (1 Lanes)	PM	770	500	1680	550	320	1140
I-110 s/o PCH	AM	5520	480	6410	4010	670	5190
Northbound (4 Lanes)	Midday	4370	870	5950	4550	740	5860
Southbound (4 Lanes)	PM	4600	570	5650	6120	370	6790
110 Ramps / Ocean Blvd	AM	2000	370	2660	1320	280	1800
Northbound (1 Lane)	Midday	1960	520	2870	1270	290	1790
Southbound (1 Lane)	PM	2650	340	3250	1730	120	1950

*PCE is Passenger Car Equivalent (1 bobtail = 1.1 cars, 1 chassis = 2 cars, 1 container = 2 cars)

Table 21 - Forecasted 2011 During-Construction Peak-Hour Traffic Volumes

Location	Peak Hour	Northbound			Southbound		
		Auto Traffic	Truck Traffic	Total PCE* Traffic	Auto Traffic	Truck Traffic	Total PCE* Traffic
Heim bridge	AM	240	170	520	450	400	1170
Northbound (2 Lanes)	Midday	380	580	1390	170	470	960
Southbound (1 Lane)	PM	810	400	1480	250	150	500
I-710 s/o PCH	AM	3770	1140	5790	3880	1540	6560
Northbound (3 Lanes)	Midday	3100	1730	6190	3680	1530	6420
Southbound (3 Lanes)	PM	4190	1290	6500	4840	830	6340
I-710 Ramps / Ocean Blvd	AM	1040	410	1760	400	600	1460
Northbound (2 Lanes)	Midday	580	670	1790	320	620	1430
Southbound (1 Lane)	PM	800	550	1800	580	350	1200
I-110 s/o PCH	AM	5490	510	6420	4130	700	5360
Northbound (4 Lanes)	Midday	4430	890	6030	4400	750	5730
Southbound (4 Lanes)	PM	4620	590	5700	6180	380	6870
110 Ramps / Ocean Blvd	AM	2040	370	2710	1440	300	1970
Northbound (1 Lane)	Midday	2050	540	2990	1260	320	1830
Southbound (1 Lane)	PM	2720	350	3340	1790	140	2030

*PCE is Passenger Car Equivalent (1 bobtail = 1.1 cars, 1 chassis = 2 cars, 1 container = 2 cars)

In accordance with Highway Capacity Manual (HCM) guidelines, traffic operation Level of Service (LOS) categories A through F are directly related to the demand volume to capacity (V/C) ratios as indicated below:

Table 22 - LOS Categories

LOS	V/C Ratio
A	< 0.28
B	0.28 – 0.44
C	0.45 – 0.64
D	0.65 – 0.85
E	0.86 – 1.0
F	> 1.0

It should be noted that Table 22, breakdown of LOS categories, is applicable to all freeway locations with the exception of the Schuyler Heim Bridge. Since the speed on the Schuyler Heim is 35 mph pre-construction and assumed to be 25 mph during the construction, the LOS definitions in Table 20 are not applicable. However the definition of V/C>1.0 as being LOS F and V/C<1.0 as being LOS E or better are still valid. Hence the Schuyler Heim Bridge LOS analysis is defined as: if the V/C is less than 1.0, then LOS is E or better, else the LOS is F.

Using the recommended HCM freeway and freeway ramps capacities and LOS categories defined above, LOS on the key freeway locations is provided in Table 21. As shown, the bridge would operate at LOS E or better during the AM, Mid-day and PM peak hours.

Table 23 - Level of Service Analysis

Location	Peak Hour	Northbound				Southbound			
		PRE CONST		CONST		PRE CONST		CONST	
		V/C Ratio	LOS	V/C Ratio	LOS	V/C Ratio	LOS	V/C Ratio	LOS
Schuyler Heim Bridge	AM	0.15	E or Better	0.17	E or Better	0.27	E or Better	0.75	E or Better
	Midday	0.30	E or Better	0.45	E or Better	0.21	E or Better	0.62	E or Better
	PM	0.31	E or Better	0.48	E or Better	0.14	E or Better	0.32	E or Better
	Number of Lanes	*3*		*2*		*3*		*1*	
I-710 s/o PCH	AM	0.84	D	0.86	E	0.96	E	0.97	E
	Midday	0.90	E	0.92	E	0.94	E	0.95	E
	PM	0.96	E	0.96	E	0.93	E	0.94	E
	Number of Lanes	*3*		*3*		*3*		*3*	
I-710 Ramps / Ocean Blvd	AM	0.47	C	0.50	C	0.71	D	0.77	D
	Midday	0.47	C	0.51	C	0.71	D	0.75	D
	PM	0.48	C	0.51	C	0.60	C	0.63	C
	Number of Lanes	*2*		*2*		*1*		*1*	
I-110 s/o PCH	AM	0.71	D	0.71	D	0.58	C	0.60	C
	Midday	0.66	D	0.67	D	0.65	D	0.64	C
	PM	0.63	C	0.63	C	0.75	D	0.76	D
	Number of Lanes	*4*		*4*		*4*		*4*	
110 Ramps / Ocean Blvd	AM	1.40	F	1.43	F	0.95	E	1.04	F
	Midday	1.51	F	1.57	F	0.94	E	0.96	E
	PM	1.71	F	1.76	F	1.03	F	1.07	F
	Number of Lanes	*1*		*1*		*1*		*1*	

Schuyler Heim Bridge Pre-Construction Capacity=2,100 pc/h/l
Schuyler Heim Bridge During-Construction Capacity=1,550 pc/h/l
Freeway Capacity=2,100
1-lane Ramp Capacity=1,900 pc/h/l and 2-lanes Ramp Capacity = 3,500 pc/h/l

New Dock Southbound On-Ramp and Off-Ramp Closures

Off-Ramp Closure

During the construction period, the New Dock Street off-ramp from SR-47 will be closed for several months. In order to analyze the impact of this closure, the TDF model was run by closing the New Dock Street off-ramp addition to reducing the number of lanes on Schuyler Heim Bridge.

Based on the change in truck volumes predicted by the traffic model (illustrated on Exhibits 28, 29, and 30), the level of service (LOS) is not expected to be significantly impacted with respect to traffic operations on the major routes in the study area. Approximately there would a reduction of 140, 130 and 60 truck volumes using southbound Schuyler Heim Bridge during the AM, Mid-day and PM peak hours, respectively, as shown in Figures 28-30. These trucks are mostly diverted to I-710 and I-110. Thus, routes currently operating at acceptable levels (those operating at LOS D or better) are not expected to become congested due to the lane closure of Schuyler Heim Bridge combined with the off-ramp closure. The closure will add more traffic to I-710 during times when it operates at LOS E or F, traveler delays may become somewhat longer on the I-110 or I-710 at times when these freeways are operating at LOS E or F.

On-Ramp Closure

During the construction period, the New Dock Street on-ramp from SR-47 will be closed several months. In order to analyze the impact of this closure, the TDF model was run by closing the New Dock Street on-ramp addition to reducing the number of lanes on Schuyler Heim Bridge.

Based on the change in truck volumes predicted by the traffic model (illustrated on Exhibits 31, 32, and 33), the level of service (LOS) is not expected to be significantly impacted with respect to traffic operations on the major routes in the study area. Approximately there would a reduction of 90, 130 and 90 truck volumes using northbound Schuyler Heim Bridge during the AM, Mid-day and PM peak hours, respectively, as shown in Figures 31-33. These trucks are mostly diverted to I-710 and I-110. Thus, routes currently operating at acceptable levels (those operating at LOS D or better) are not expected to become congested due to the lane closure of Schuyler Heim Bridge combined with the on-ramp closure. The closure will add more traffic to I-710 during times when it operates at LOS E or F, traveler delays may become somewhat longer on the I-110 or I-710 at times when these freeways are operating at LOS E or F.

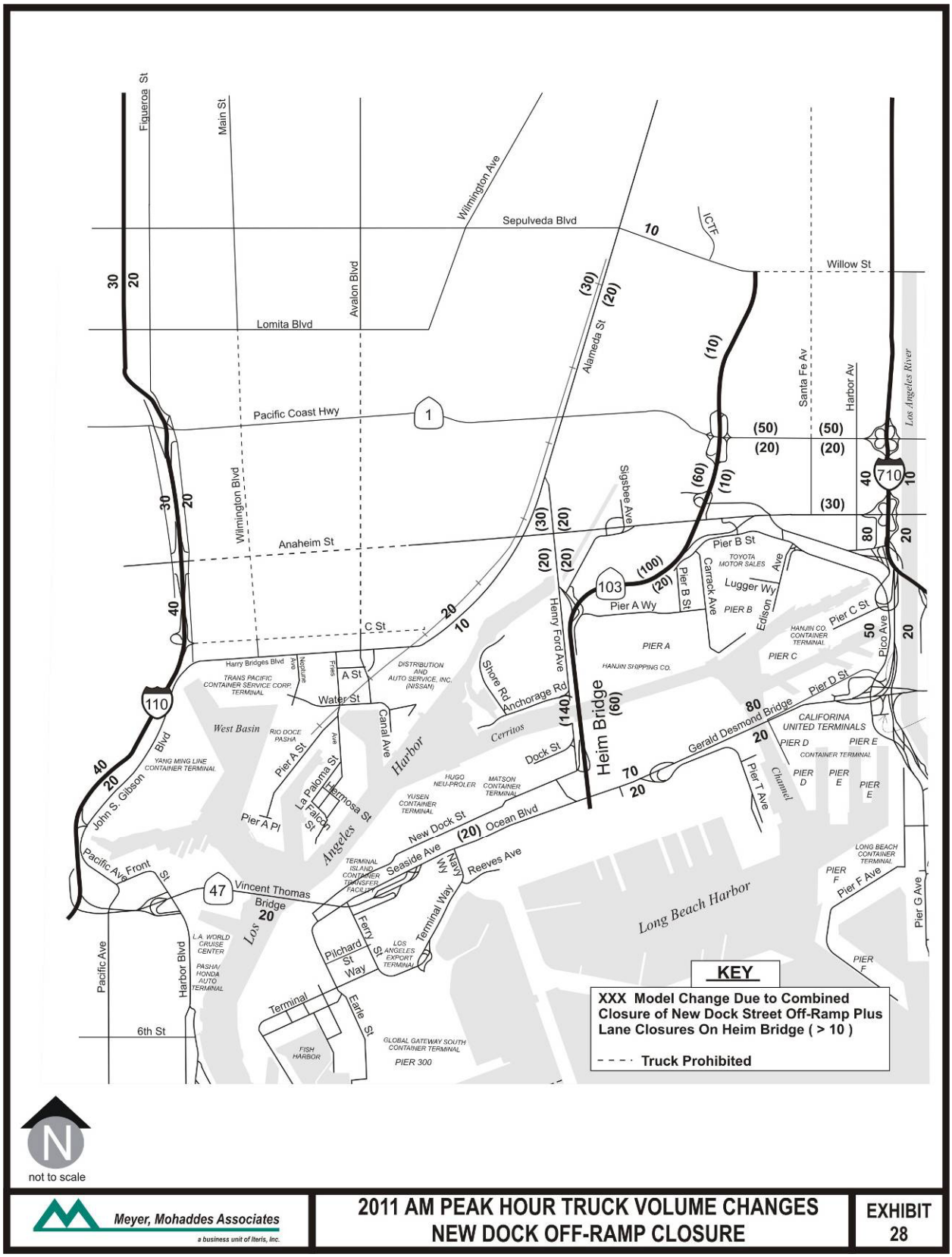
Findings

The closure of lanes on the Schuyler Heim Bridge for construction purposes is not anticipated to significantly impact traffic operations on nearby streets and freeways. Nearly all of the traffic that would normally use the Schuyler Heim Bridge, and travel on SR-103 or Henry Ford Avenue, is expected to use the I-110 or I-710 Freeways to get into and out of the Port area. Although this will increase the amount of traffic on these two freeways, they are expected to operate at the same level of service as they would if lanes on the bridge were not closed. Thus,

during the bridge construction, the delay experienced by travelers/truck operators that normally use the Schuyler Heim Bridge is not expected to materially affect other travelers/truck operators in the region.

It should be noted that the conclusions given above are based on a preliminary level traffic analysis. A more detailed traffic analysis and preparation of a Traffic Management Plan (TMP) should be done during the design phase. The TMP will address strategies that should be used to enhance traffic operations during construction, such as:

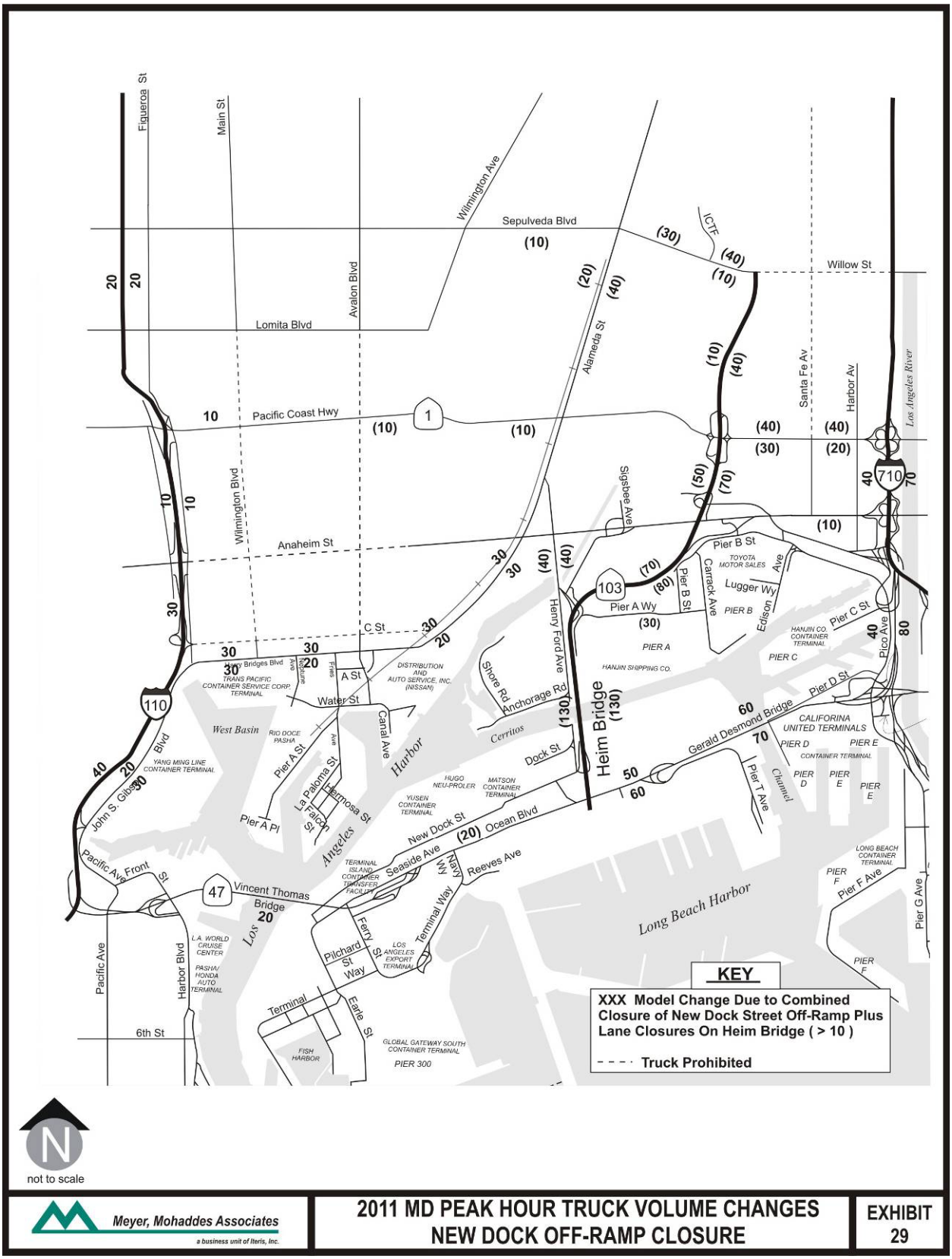
- Public Awareness Campaign
- Alternate/detour routes with recommended signing
- Enhancements to existing signing and striping
- Safety and enforcement considerations
- Contingency Plans



Meyer, Mohaddes Associates
a business unit of Iteris, Inc.

2011 AM PEAK HOUR TRUCK VOLUME CHANGES NEW DOCK OFF-RAMP CLOSURE

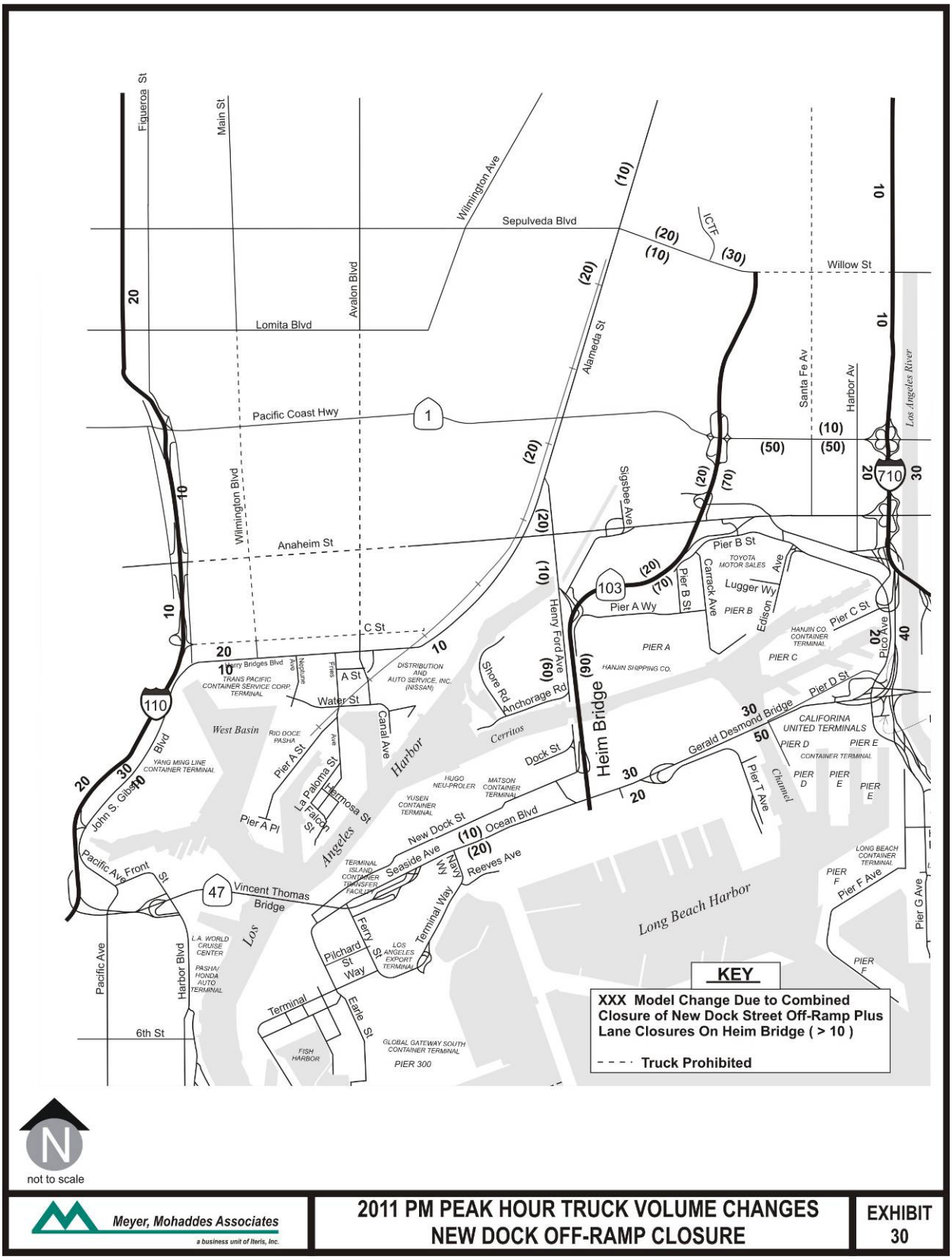
EXHIBIT 28



Meyer, Mohaddes Associates
a business unit of Iteris, Inc.

2011 MD PEAK HOUR TRUCK VOLUME CHANGES
NEW DOCK OFF-RAMP CLOSURE

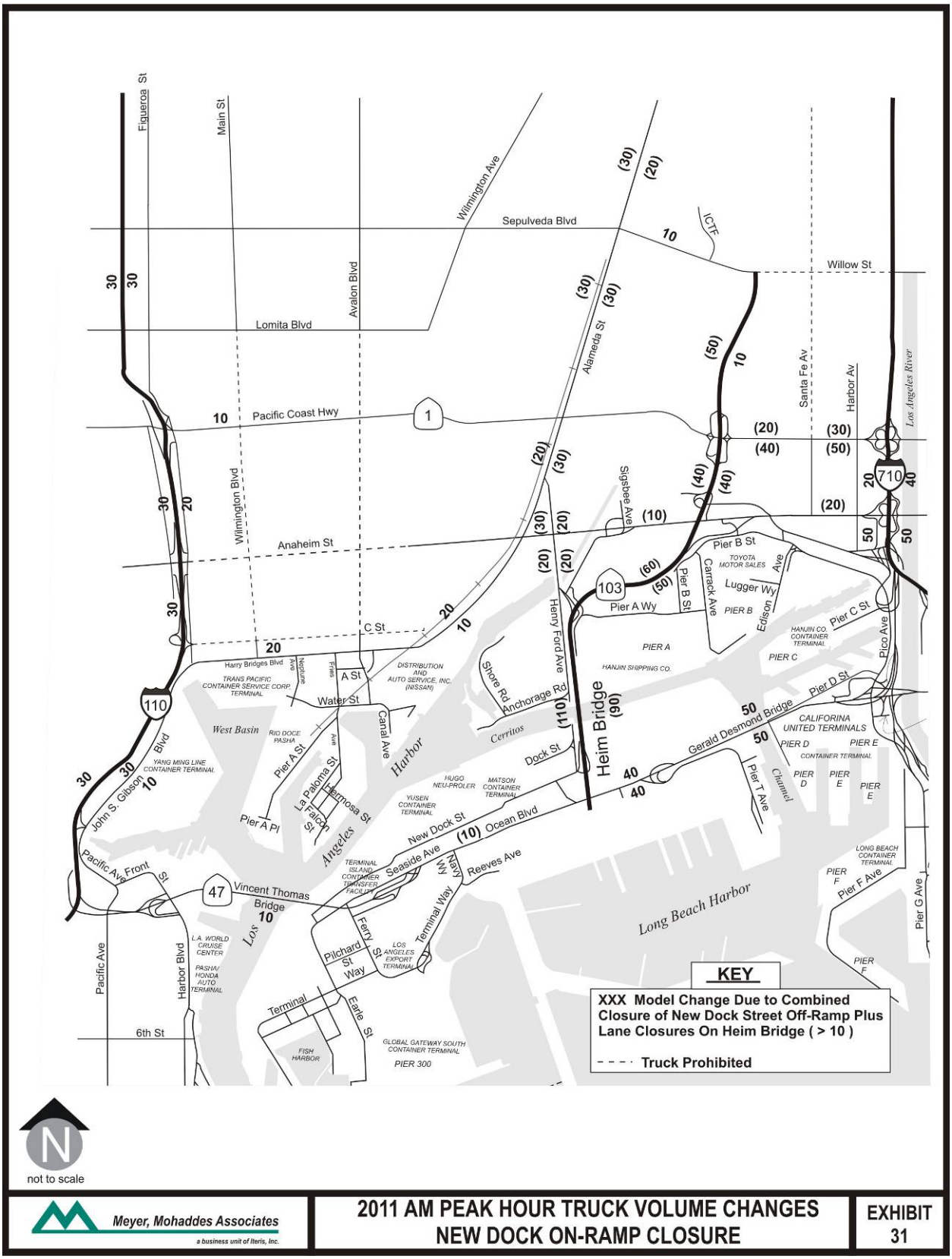
EXHIBIT 29



Meyer, Mohaddes Associates
a business unit of Iteris, Inc.

2011 PM PEAK HOUR TRUCK VOLUME CHANGES NEW DOCK OFF-RAMP CLOSURE

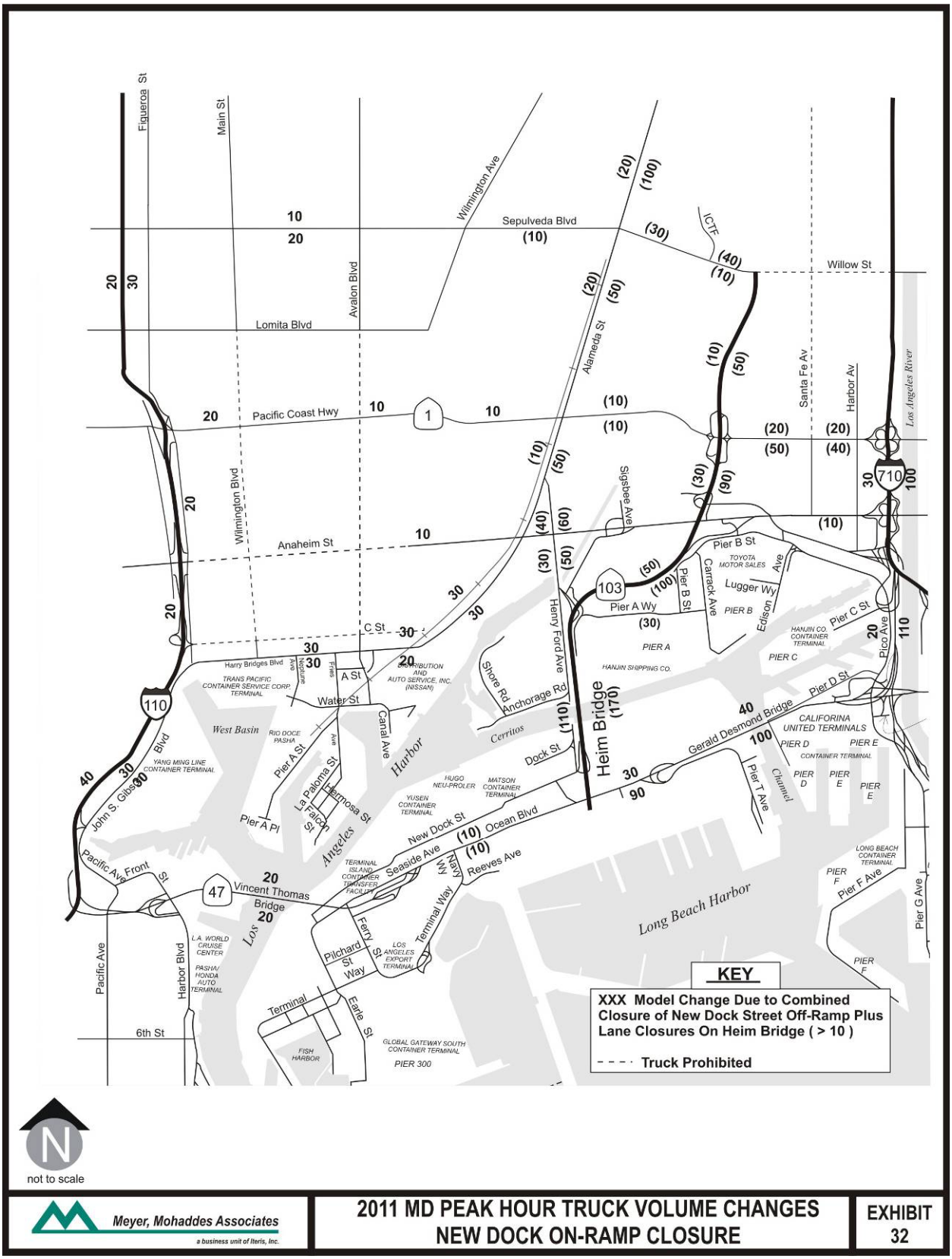
EXHIBIT 30



Meyer, Mohaddes Associates
a business unit of Iteris, Inc.

2011 AM PEAK HOUR TRUCK VOLUME CHANGES NEW DOCK ON-RAMP CLOSURE

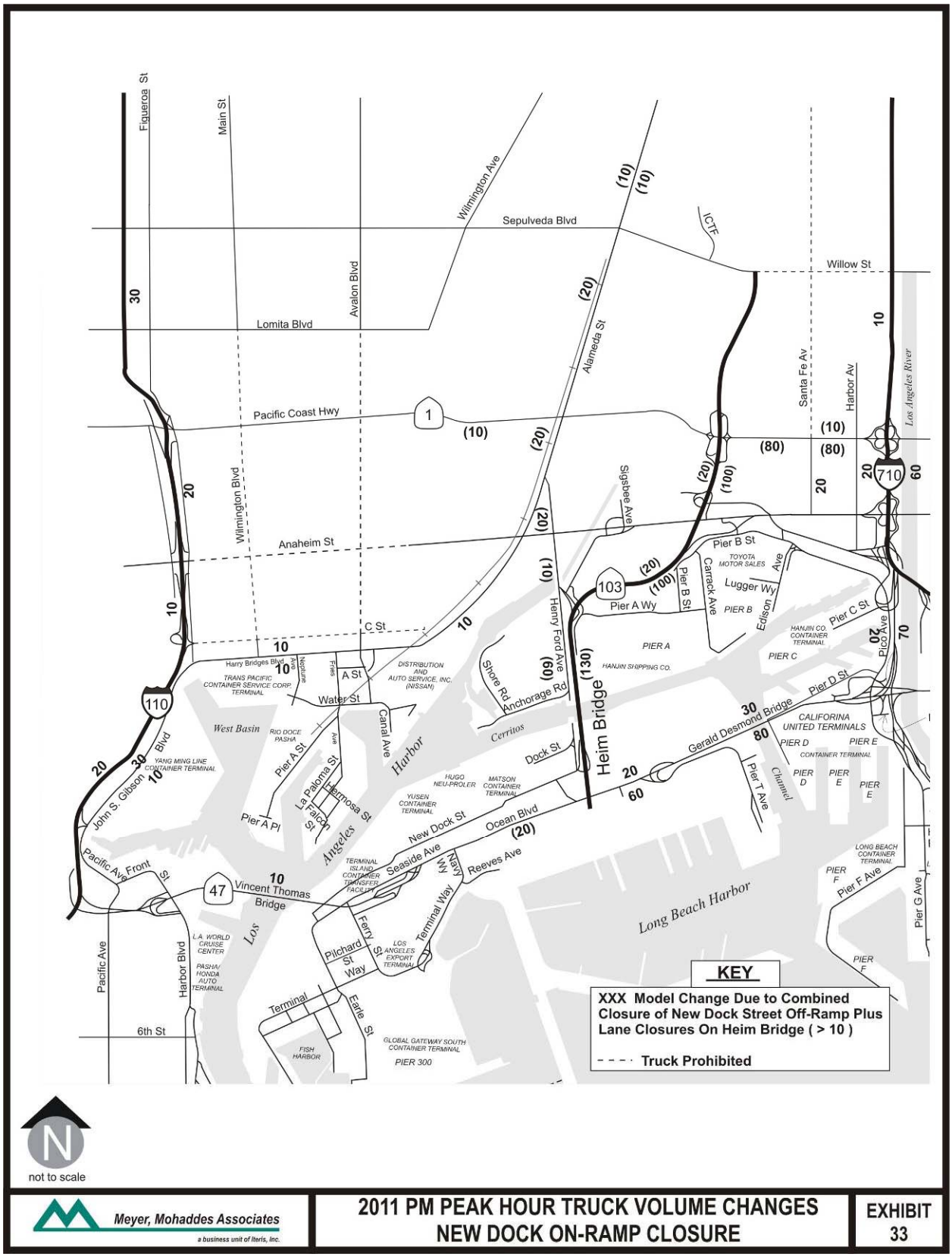
EXHIBIT 31



Meyer, Mohaddes Associates
a business unit of Iteris, Inc.

2011 MD PEAK HOUR TRUCK VOLUME CHANGES NEW DOCK ON-RAMP CLOSURE

EXHIBIT 32



Meyer, Mohaddes Associates
a business unit of Iteris, Inc.

2011 PM PEAK HOUR TRUCK VOLUME CHANGES NEW DOCK ON-RAMP CLOSURE

EXHIBIT 33

CONCLUSIONS

The findings of the traffic study for the Schuyler Heim Bridge Replacement and SR-47 Expressway project are summarized as follows:

1. Existing (2004) Conditions

    a. Intersection Levels of Service – All study intersections operate at acceptable LOS D or better during AM, Midday and PM peak hours
    b. Weaving Analysis – no weaving analysis required under existing conditions
    c. Interchange Analysis – no interchange analysis required under existing conditions

2. Year 2030 – Alternative 1

    a. Weaving Analysis – Levels of service B for southbound direction and C for the northbound direction.
    b. Interchange Analysis – The interchange will operate at LOS D or better.
    c. Expressway mainline – Level of Service C or better is forecast on the mainline

3. Year 2030 – Alternative 2

    a. Weaving Analysis – no weaving analysis required.
    b. Interchange Analysis – The interchange will operate at LOS E or better
    c. SR-103 (south of PCH) mainline – Level of Service E conditions are forecast on the mainline with this alternative.

APPENDICES

1. Existing Turn Volumes and Level of Service Worksheets (AM, Midday, PM)

2. HCM Methodology Comparison of P_T=0 and P_T>25%

3. 2030 Base Level of Service Worksheets (AM, Midday, PM)

4. 2030 Base Mainline Analysis Worksheets (AM, Midday, PM)

5. 2030 Base SR-47/Ocean Blvd. Interchange Synchro Analysis (AM, Midday, PM)

6. CORSIM Model for Weaving Analysis of Alternative 1

7. 2030 Alternative 1 Level of Service Worksheets(AM, Midday, PM)

8. 2030 Alternative 1 Mainline Analysis Worksheets (AM, Midday, PM)

9. 2030 Alternative 1 SR-47/Ocean Blvd. Interchange Synchro Analysis Worksheets (AM, Midday, PM)

10. 2030 Alternative 1 Lower PCH Worksheets (AM, Midday, PM)

11. 2030 Alternative 2 Level of Service Worksheets (AM, Midday, PM)

12. 2030 Alternative 2 Mainline Analysis Worksheets (AM, Midday, PM)

13. 2030 Alternative 2 SR-47/Ocean Blvd. Interchange Synchro Analysis Worksheets (AM, Midday, PM)

14. CORSIM Model Output for SR47 Expressway/PCH Intersection

15. Alameda Street and 223rd Connector Ramp Syncro Analysis

16. Air Quality Traffic Data

Appendix B
UC Davis Comments

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FINAL MEMORANDUM

September 8, 2008

TO: Mike Brady (Caltrans)

FROM: Doug Eisinger, Deb Niemeier (UC Davis-Caltrans Air Quality Project)
Deborah Bennett (UC Davis Department of Public Health Sciences)

SUBJECT: Brief Screening-Level Review of the Draft Health Risk Assessment (HRA) for the Schulyer-Heim Bridge Replacement and SR-47 Expressway Project (Heim Bridge)

This memo updates our June 24, 2008 memorandum that responded to your request that we provide a high level review of the June 2008 Draft HRA[1] for the Heim Bridge project. There are no substantive changes between the June 24, 2008 document and this document; this memo streamlines some of the text from the June memo and clarifies that this communication is a final work product.

We have scanned the draft report and identified any obvious questions or issues regarding: travel activity, emissions, concentrations, exposure, and risk. We also had some comments regarding mitigation, using "reasonable" vs. "worst-case" modeling assumptions, and differentiating this project from other projects. The expediency with which this review was requested prohibits detailed analysis, but we have identified some issues that we believe relate to future HRAs. We strongly encourage Caltrans/U.S. Federal Highway Administration to consider a formalized effort aimed at developing a systematic framework for conducting HRAs for transportation project-level analysis. As a matter of note, all page number references cited below are to the 44-page June 2008 Draft HRA.

[1] Draft Health Risk Assessment for the Schulyer-Heim Bridge Replacement and SR-47 Expressway Project. Prepared for Alameda Corridor Transportation Authority, Carson, CA. Prepared by Weston Solutions, Inc. June 2008.

Travel Activity

- The project description text should note the beginning and ending of the construction phase and the built year. We were unable to determine when the project became operational, but assumed it was in year 2015.

- The analysis segregated traffic activity into the four time periods currently used by SCAG to model the regional transportation plan (RTP): AM peak, midday activity, PM peak, and night activity (p. 11). This approach is reasonable. It is generally considered more optimal in terms of traffic level predictions to have a greater number of modeling time periods. The UCD-Caltrans mobile source air toxics (MSAT) methodology prepared in 2006 with multi-agency input recommended, at the minimum, travel estimation for at least the peak vs. off-peak periods.

- The level of travel activity is typically the most important variable in completing air quality related project assessments. In the main body of the report, details should be expanded to include activity assumptions for the no-build and build alternatives, including fleet mix (truck percentage), volumes, and speeds. This information would be especially valuable for the main routes directly affected by the project: for Alternative 1, illustrating how truck traffic would be diverted from SR-103 to SR-47 (as described on p. 25), and how, for Alternative 2, truck traffic would be diverted from the Alameda St. corridor to SR-103 (as described on p. 25). The report employs traffic projections "from the traffic study" (p. 11); however, the genesis of this traffic study is not clear. Did this traffic study document expected traffic shifts to/from adjacent facilities and any other affected facilities such as the 110 and 710 freeways? The report also notes that traffic volumes and average daily traffic were developed using information from the Ports and from SCAG (pp. 11-12). It appears that the project analysts used travel assumptions consistent with regional analysis, which would be appropriate; however, as noted above, further documentation is needed to understand where and how the various assumptions are employed in the analysis. The traffic study should be included in the material as an appendix.

- Page 20 of the report describes how "conservative traffic assumptions" were used to create the scenarios to be analyzed. Using a conservative approach would appear to be correct in concept; however, it is critical to document assumptions, and to clearly identify how each was conservative.

- Standard milestone years for project-level air quality analysis typically include a base year, the year of project completion, and the design year (usually defined as the project completion year plus 20 years). It is not a serious problem that this analysis used different years, however the analysis years neither match the standard air quality approach, nor do they align the 70-year exposure assessment period with the years the project is operational (some of the 70 years are before the project is built, some are after the project is built). It would seem more logical to have the 70-year window begin with the year of project completion, so that the entire risk analysis would reflect no-build vs. build conditions.

Emissions

- The emissions assessment includes assumed implementation of various control programs which are part of the Ports Clean Air Action Plan (CAAP) (p. 9). For example, one of the assumptions is that 100% of trucks entering the Port by January 1, 2012 will meet 2007 federal clean truck standards (p. 9). As a general practice, the U.S. EPA typically discounts the effectiveness of control programs for planning purposes, to account for unexpected implementation delays and problems, as well as enforcement issues and other factors that can lessen effectiveness. So, for example, EPA has sometimes assumed that control programs achieve only 80% of the emission reductions that would occur if the program was fully implemented as planned. Unless the CAAP's emission reductions are federally enforceable, it would be more in keeping with standard practice to discount the anticipated effectiveness of these controls, rather than assume 100% successful program implementation. The HRA should clearly identify which control strategies are included in the analysis, which strategies are enforceable compared to those that are merely planned, and what year they are expected to be implemented.

- Alternative 1 provides for grade separations, which would generally be expected improve traffic flow and reduce emissions (p. 7).

- Use of EMFAC2007 was appropriate. It appears that the study took vehicle deterioration into account when estimating LNG vehicle emissions (p. 10), and that conservative assumptions were made about the lack of LNG truck introduction after 2011 (p. 11). Further details would be helpful to document the methodology for LNG trucks consistent with EMFAC2007 (p. 10).

- It appears that the analysis used the 2006 UCD-Caltrans MSAT methodology, which is reasonable since that methodology was the only readily-available tool during 2007 when the analysis was likely completed. Future analyses (for other projects), should use the UCD-Caltrans CT-EMFAC model, the most recent version of which is dated May 2008, since it incorporates a more robust methodology to account for MSAT emissions.

- As mentioned later under both the Risk and Mitigation sections, there is confusion about what is meant by the "mitigation scenarios" explored for 2015. Further documentation on these is necessary to understand whether the emission factors chosen to represent the mitigation scenarios were different than the other scenarios (see pp. 13, 20).

- The main report text should clarify which gasoline and diesel-related compounds are covered by the health risk assessment. The MSATs listed in the main report are recognized as priority MSATs by the U.S. Environmental Protection Agency and are appropriate compounds for analysis. Material in an appendix seemed to indicate that, beyond diesel PM, several additional diesel-related compounds were evaluated; if this is the case, this should be made clear in the main body of the report.

Concentrations

- The spacing of the receptors seemed to be appropriate to capture near-road impacts since they were spaced at 50 m intervals close to the affected facilities (p. 16).

- Overall, the dispersion modeling approach appears reasonable based on the tools used and the information provided in the main body of the report.

Exposure

- The text states that maximum 1-hour concentrations were used for acute effects. For some compounds, the acute time frame uses a slightly longer time period. In general, HRAs should match the time period of exposure and health concern (e.g., for some pollutants, the reference dose should be compared to a maximum six or seven hour concentration). We did not check the time frames for the pollutants under consideration. The Hazard Index (HI) will only go down if longer time periods are used. The text should state the time-frames of interest for all the pollutants evaluated.

- The breathing rate needs to be confirmed. Using the parameters listed for the Gamma distribution in OEHHA's 2003 "Air Toxics Program Risk Assessment Guidelines"[2], along with Crystal Ball software, we derived an 80th percentile value of 393.9 L/kg-day. The guidelines list a high-end value of 393 L/kg-day, which matches the 80th percentile value we calculated. However, the analysis done in the report we are evaluating states that the 80th percentile value is 302 L/kg-day. This value should be revised upwards. The discrepancy may be that the 302 L/kg-d comes from an estimate of the adult breathing rate. The value presented for use by OEHHA (2003) assumes a 70-year exposure beginning in childhood, such that the higher breathing rates for children's early years are incorporated into the estimate for the entire lifetime. The OEHHA guidance value should be used.

- The OEHHA guidance also states, "The risk assessment guidelines require the use of the 95th percentile (i.e., high-end) breathing rate for all assessments of cancer risk by the inhalation route in Tier-1 risk assessments in order to avoid underestimating risk to the public, including children." The potential discrepancy between the listed "high-end" value in the report, which appears to be the 80th percentile, and the OEHHA guidance, should be resolved by following OEHHA guidance.

- The breathing rates for the workers should also be confirmed once the residential breathing rate has been established.

- The concentrations do not consider potentially lower indoor air concentrations for some of the particle bound species. By not including this factor, the concentrations are more conservative than they need to be. However, given the temperate climate in the Long Beach area, doors and windows may be open a considerable fraction of time, in which case the conservative approach is appropriate.

[2] See: http://www.oehha.org/air/hot_spots/pdf/HRAfinalnoapp.pdf.

Risk

- (*see also first bullet comment below under Mitigation*) The text on pages 20 and 23 is confusing – it seems to imply that, in addition to the build vs. no-build scenarios, there were other sensitivity analyses done for year 2015. However, the text on p. 24 notes that these sensitivity analyses were simply build vs. no-build comparisons. The final document should clarify the analyses discussed.

- The modeling time period was 2003 to 2072, which is said to be "for purposes of CEQA comparison." The baseline assumes no project construction, and the project scenarios assume project emissions from the year 2015 onward (page 13). The linear extrapolation is from 2003 to 2015, and from 2015 to 2030. It is not made clear if the HRA assumed a "baseline" version of 2015 for the first averaging period, and a "project" version of 2015 for the second averaging period. As we state elsewhere, it was also not clear which control programs (mitigation) were assumed to be operative in the no-build and build scenarios. Also, as stated above, a broader concern is that, ideally, we would want to make risk comparisons beginning at the time period the project was completed, and extending for 70 years from that time point.

- There are two issues with the presentation of the HI results. First: South Coast Air Quality Management District (SCAQMD) guidance[3] does indicate that the standards for a project are increases in the HI of less than 1.0. Also necessary to determine, however, is if the project pushes the exposed population from below 1.0 to above 1.0. Second: from the report, we cannot determine the value of the ultimate HI. A look through the appendices does not clear up the issue either as it is not clear if the values presented are the HI considering all sources of exposure, or just the difference between the baseline and the project scenarios.

- The report notes that the results show "substantial regional benefits that reduce risk in the majority of the study area" (p. 34). The figures shown, however, only highlight the geographic areas where risk decreases and increases, thus it is hard to see (quantitatively) what the population-weighted risk impacts are. This information needs to be documented better.

- The actual risk values should be stated in a clear and visible manner in the main body of the report, preferably in the executive summary. Without reading Table 3.1, it is possible to have the impression that the exposed population meets all regulatory guidelines in the no-build situation. In fact, their no-build risk is already above 1×10^{-4}, the level at which action should be taken in most regulatory guidelines. While it is true that this proposed project comes very close to meeting the guidelines for the allowed increase of less than 10 in a million, this increase should be placed in context of the existing, no-build risk conditions.

[3] See: http://www.aqmd.gov/CEQA/handbook/signthres.pdf.

- The discussion (beginning p. 34) identifies factors that could contribute to over-estimating the risk impacts. Some points merit further discussion. The first bullet statement notes that actual goods movement activity may be less than what is forecasted, thus reducing activity and risk. Presumably, the premise for the entire project is the need to satisfy future goods movement demand – if that demand has been over-predicted, then the basis for the entire project is in question. We recommend removing the bullet. The second bullet statement on page 34 includes helpful comments about the fact that future controls may be implemented that are not yet credited; however, as discussed under the "Emissions" section, it would be more appropriate to discount the assumed effectiveness of the Ports CAAP.

- The risk discussion would benefit by including information describing the conservative nature of the risk assessment process, including, for example, the approach used to establish unit risk factors and the analytical process of assuming 70-year exposures regardless of the low probability of individuals remaining in one location for 70 years. That would help provide the general public with some context to understand how to interpret the risk results.

- The individual pollutants and the exposure pathways used to complete the analysis should be stated in the main body of the report. Currently, some of this is documented in an appendix, and some is mentioned in the text, but it is difficult to identify. Our assumption is that the modeled risk is largely a function of diesel PM exposure via inhalation. It would be helpful, especially to inform how to structure future HRAs, to break down the attribution of risk by pollutant, and by exposure route. If, as expected, virtually all of the health risk is due to diesel PM, and by inhalation, documenting these results would help encourage streamlining future HRAs to eliminate analytical work with little informational value.

<u>Mitigation</u>

- (*See also the first bullet point above under Risk*) There is a discussion under Section 2.3 (Risk Assessment Approach, p. 20) which refers to a year 2015 "mitigation scenario." It is not clear what this means. It appears that year 2015 risks were estimated for the purpose of identifying homes impacted, and to help identify homes that would be candidates for mitigation (as described later on p. 35). Is this correct? How does this information compare to the risk information presented in Table 3-1? Also, the page 20 text creates some confusion about the assumptions for all of the no-build vs. build analyses. Page 20 states that year 2015 analyses were based on known emission reduction strategies as the basis for mitigation. It was not clear whether all the build scenarios were modeled with the known emission reduction strategies, or just the ones for the 2015 analysis. The text on p. 20 implies that the mitigation was used only for 2015, but on page 9, it said the Ports CAAP was assumed for both 2015 and 2030. Was there some mitigation other than the Ports CAAP also assumed for 2015? Also, the text on page 35 refers to the sensitivity analysis results in Figure 4-1; that figure is not included.

- The mitigation discussion (p. 35) describes approximately 12 homes as meriting mitigation, and expanding that pool of homes to 100 to 200 to provide a safety buffer and ensure anonymity of the impacted receptors. The justification seems understandable, but the

impact – raising the number of sites to be mitigated by a factor of about 10 to 15 – seems overly high. Given the conservative nature of risk assessments (see comment under Risk above), margins of safety are already built into the analysis. The need for mitigation, and the geographic coverage for such mitigation, should be further examined.

- The choice of mitigation (p. 36) requires further discussion and documentation. HVAC system effectiveness can be easily defeated simply by opening windows or doors. The socio-economic status of these residents also needs to be considered as they are likely to minimize HVAC use if operational cost is prohibitive. For HVAC improvements to be an effective mitigation, some consideration needs to be given to ensuring that adequate resources are available to pay for ongoing HVAC system maintenance as well as the monthly bills that would be incurred due to HVAC operation. If, however, HVAC system improvements need only be effective for a small fraction of the year to reduce risk below the target level, that information should be described. Alternatively, other mitigation could be examined if the HVAC systems prove impractical. For example, there is some literature that shows that tree screens (particular species of trees) have successfully reduced ambient PM levels. If tree-planting is a practical solution for the affected sites, that option could be explored as well.

Minor / Miscellaneous Issues

- Page 5 of the report describes Alternative 1 as replacing the existing bridge with a "slightly wider" new bridge – we assumed that the new structure did not increase capacity by adding travel lanes, since the text focused on the addition of standard shoulders. If that is not the case, the text should be clarified.

Broader HRA Discussion Points

1. Differentiating Project Types: Which Projects Merit Assessment?

Separate from the Heim Bridge project assessment, you have asked us for thoughts concerning which types of projects might be more appropriate for HRAs. Since there is no regulatory requirement to prepare an HRA for transportation projects, there are no uniform procedures for completing such assessments, for interpreting the results obtained, or for communicating the findings to the public in a meaningful way. In the Heim Bridge analysis, this has resulted in, for example, confusing analysis years, lack of understandable travel activity and modeling assumptions, and other issues as discussed above. We highly recommend that Caltrans consider implementing a study in which a small number of project-level HRAs are completed by a qualified team, using different analytical approaches for each of the analyses. The various approaches and results can then be compared and assessed as to their explanatory value, as well as the time and cost involved with their preparation. We believe that this process will also help to establish the outlines of a broader HRA analysis framework for transportation projects that can be used to gather multi-agency input, and to gain consensus from other regional, state and federal partner agencies on the need for these studies and the usefulness of different HRA options.

Diesel PM is the risk driver in the Heim Bridge case (p. 36) as well as in other California communities (e.g., see findings from the MATES-II and III studies). Accordingly, one option for selecting candidate projects for HRA pilot studies is to examine project situations involving an unusually high percentage of diesel traffic. Also, given the literature on near-road pollutant concentrations, study candidates could include cases where there are residential areas and schools in close proximity (e.g., within 100 m) to a project. For example, projects facilitating increased goods movement through ports, where environmental justice and community concerns are high, would be good candidates to explore how to implement HRAs and to pilot test what risk information is of most value to assist public involvement in the project selection process.

2. Worst-Case vs. Real-World Analyses

Independent of the Heim Bridge project, you also asked for thoughts concerning how to estimate risk when completing HRAs; in particular, you asked whether such assessments should focus on using worst-case or real-world assumptions. OEHHA guidance[4] for hot-spot analyses recommends using a tiered approach to risk assessment, and such an approach might be applicable for transportation projects as well. In concept, tiered analyses begin by using conservative assumptions to facilitate screening assessments; if a project passes a simplified conservative screening test, the analysis is complete. Projects that fail an initial screening test can move to the next tier of analysis, which can involve replacing default screening assumptions with site-specific conservative information. Projects failing second tier review then move to more detailed assessment involving distributions for input data. A tiered approach would be consistent with other project-level analysis protocols, such as the carbon monoxide protocol developed for Caltrans by UC Davis.

In addition, HRAs could also consider presenting population-weighted risk impacts as well as site-specific impacts. OEHHA guidance, for example, recommends that hot-spot analyses assess population risk. A population risk analysis often includes two approaches. One approach involves estimating total cancer burden across the population – in other words, the increased number of excess cancers that are forecasted to occur across the population as a whole. A second approach involves estimating cancer risk by specifying the size of population at a given level of risk. From a more practical standpoint, this can be done as the number of people exposed to concentrations that result in excess cancer risks of less than 1 per million, 1-10 per million, 11-20 per million, and so on. The first approach details total risk. The second approach allows for greater resolution – enabling analysts to understand whether the absolute number of excess cancers is derived from a small pool of highly exposed individuals, or a large pool of people exposed to relatively lower concentrations and risk. In addition, OEHHA recommends presenting two sets of risk values: one set using conservative, high-end exposure assumptions (e.g., 80th or 95th percentile values for exposure), and a second set using average exposure factors.

In summary, a general approach for completing HRAs might include steps such as the following:

- As a first-tier screening approach, calculate increased risk using high-end, conservative values (higher concentrations and longer exposure periods). Present the actual risk

[4] (See OEHHA guidance available at footnote 2 Internet address.)

numbers in addition to the change in risk. Determine whether there are homes/receptors exceeding incremental additional risk criteria. If there are, then:

- As a second-tier approach, reassess increased risk for the affected receptors using site specific conservative values, rather than general conservative values.
- For context, reassess the increased risk for the affected receptors using typical values, rather than conservative values.
- Once this suite of information is available, project sponsors can then evaluate whether mitigation is warranted, or whether further analytical work is needed. If they do not feel they can move forward on the project with the results obtained, they might conduct additional analysis; for example:
    - Present the overall population-based impact of the project by summing the change in risks over the population, especially if risk is reduced for a significant portion of the population.
    - Conduct an uncertainty analysis to provide the likely range of expected impacts, rather than just point estimates. The HARP[5] tool, for example, has an option for Monte Carlo simulation that could assist with such analyses.

In closing, in our judgment, we believe it is premature to define a specific HRA analytical approach for transportation projects. Since relatively little work has been done to establish uniform transportation project-level HRA procedures, we do not believe the Heim Bridge approach should be used as a template for future analyses. Instead, we believe a better technical approach would be to complete several HRAs, compare them, and then assess their relative merits. Comparisons of pilot results will provide insight on whether HRA analyses should be completed, what project types they should apply to, and how to structure them assuming they are valuable.

Reference

California Office of Environmental Health Hazard Assessment (OEHHA) (2003) *Air Toxics Hot Spots Program Risk Assessment Guidelines. The Air Toxic Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments.* August. Available via: http://www.oehha.org/air/hot_spots/pdf/HRAfinalnoapp.pdf.

[5] See: http://www.arb.ca.gov/toxics/harp/harp.htm.

Appendix C
Final Schuyler Heim Bridge Replacement and SR-47 Expressway Project Air Quality Impacts Technical Study

Final

Schuyler Heim Bridge Replacement and SR-47 Expressway Project

Air Quality Impacts Technical Study

Commodore Schuyler Heim Bridge (Br. No. 53-2618) and SR-47 in the Ports of Long Beach and Los Angeles, Los Angeles County, California

07-LA-47-KP KP 4.4/9.3 (PM 2.7/5.8)
EA: 238500

February 2007
May 2007
July 2007, Revised October 2008

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February 2007

May 2007

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Acronyms

°F	degrees Fahrenheit
$\mu g/m^3$	micrograms per cubic meter
AADT	average annual daily traffic
ACM	asbestos-containing materials
ACTA	Alameda Corridor Transportation Authority
AHERA	Asbestos Hazard Emergency Response Act
AQMP	Air Quality Management Plan
ATCM	Airborne Toxic Control Measure
CAA	Clean Air Act
CAAQS	California ambient air quality standards
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CIP	cast-in-place
CO	carbon monoxide
CR	conversion ratio
DPM	diesel particulate matter
EAC	Early Action Compact
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
HE(C)	Caltrans Highway Easement
HOV	high-occupancy vehicle

I-	Interstate
ICTF	Intermodal Container Transfer Facility
IRIS	Integrated Risk Information System
ISTEA	Intermodal Surface Transportation Efficiency Act
ITS	Intelligent Transportation Systems
km	kilometers
LBP	lead-based paint
LNG	liquefied natural gas
LOS	level of service
m	meters
mby	million barrels per year
MCE	maximum credible earthquake
MHWL	mean high-water level
mph	miles per hour
MLLW	mean lower low water
MPO	Metropolitan Planning Organization
MSAT	mobile source air toxics
MTA	Metropolitan Transportation Authority
NAAQS	National ambient air quality standards
NATA	National air toxics assessment
NEPA	National Environmental Policy Act
NESHAP	National Emission Standard for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NOI	Notice of Interest
NOP	Notice of Preparation
NO_X	nitrogen oxide
O_3	ozone
OSHA	Occupational Safety and Health Administration
Pb	lead

PM_{10}	particulate matter equal or less than 10 microns in equivalent diameter
$PM_{2.5}$	particulate matter equal or less than 2.5 microns in equivalent diameter
ppm	parts per million
PST	Pacific Standard Time
REC	recognized environmental condition
ROG	reactive organic gas
ROW	right-of-way
RTIP	Regional Transportation Improvement Program
RTP	Regional Transportation Plan
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_X	sulfur oxides
SR-	State Route
TCM	Transportation Control Measure
TOG	motor vehicle organic gas
tpy	tons per year
TSM	transportation system management
U.S.C.	United States Code
VMT	vehicle-miles traveled
VOC	volatile organic compound

Executive Summary

An air quality analysis was conducted to assess potential air quality impacts associated with the replacement of the Commodore Schuyler F. Heim Bridge (Schuyler Heim Bridge) over the Cerritos Channel at the Port of Long Beach and the construction of an expressway along State Route (SR-) 47 or SR-103 to provide a high-capacity alternative route for traffic between Terminal Island and Interstate (I-) 405 (proposed action). Six alternatives of the proposed action have been proposed for analysis and are considered in this report.

The project study area addressed in this analysis lies between I-710 on the east, I-110 on the west, SR-91 on the north, and Ocean Boulevard on the south (see Figure 1). As shown, the Schuyler Heim Bridge is located within the City and Port of Long Beach. The proposed expressway would be located in the City and Port of Los Angeles (Alternatives 1 and 3) or in the Cities of Los Angeles, Long Beach, and Carson, and the Ports of Los Angeles and Long Beach (Alternative 2).

The proposed Schuyler Heim Bridge replacement and the SR-47 Expressway Project (Project ID: LA0D45) is included in the Southern California Association of Governments (SCAG) Draft 2008 Regional Transportation Improvement Program (RTIP) that is anticipated to be adopted in July 2008 and the conforming 2008 Regional Transportation Plan (RTP).

Existing air quality at the project site can be characterized using data measured at the South Coast Air Quality Management District (SCAQMD) North Long Beach monitoring station. This station monitors air concentrations of carbon monoxide (CO), ozone (O_3), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), particulate matter less than or equal to 10 microns in diameter (PM_{10}), and particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$). Ambient air quality data for the monitoring years of 2004, 2005, and 2006 show that national ambient air quality standards (NAAQS) for CO, O_3, SO_2, NO_2, and PM_{10} were not exceeded in all 3 years. State ambient air quality standards were exceeded for O_3 in 2003, and for PM_{10} in all 3 years. Both the state and NAAQS were exceeded for $PM_{2.5}$ concentrations in all 3 years. The current federal 24-hour $PM_{2.5}$ standard became effective December 2006, the exceedances presented above reflects exceedances of the old $PM_{2.5}$ standard. Ambient air quality near the Port of Long Beach is somewhat better than much of the South Coast Air Basin (Basin) because of its coastal location and prevailing onshore winds.

Implementation of the proposed action would result in potential air quality impacts during both project construction and operations. During project construction, operation of onsite heavy-duty construction equipment, earth-moving activities, vehicle trips made by employees, rerouting of automobile and marine traffic during construction, and asphalt paving would generate emissions of nitrogen oxides (NO_X), volatile organic compounds (VOC) or reactive organic gases (ROG), PM_{10}, $PM_{2.5}$, sulfur oxides (SO_X), and CO. When compared to thresholds of significance established by the SCAQMD, the construction emissions would have a temporary but significant air quality impact due to NO_X, VOC, PM_{10}, and $PM_{2.5}$ emissions.

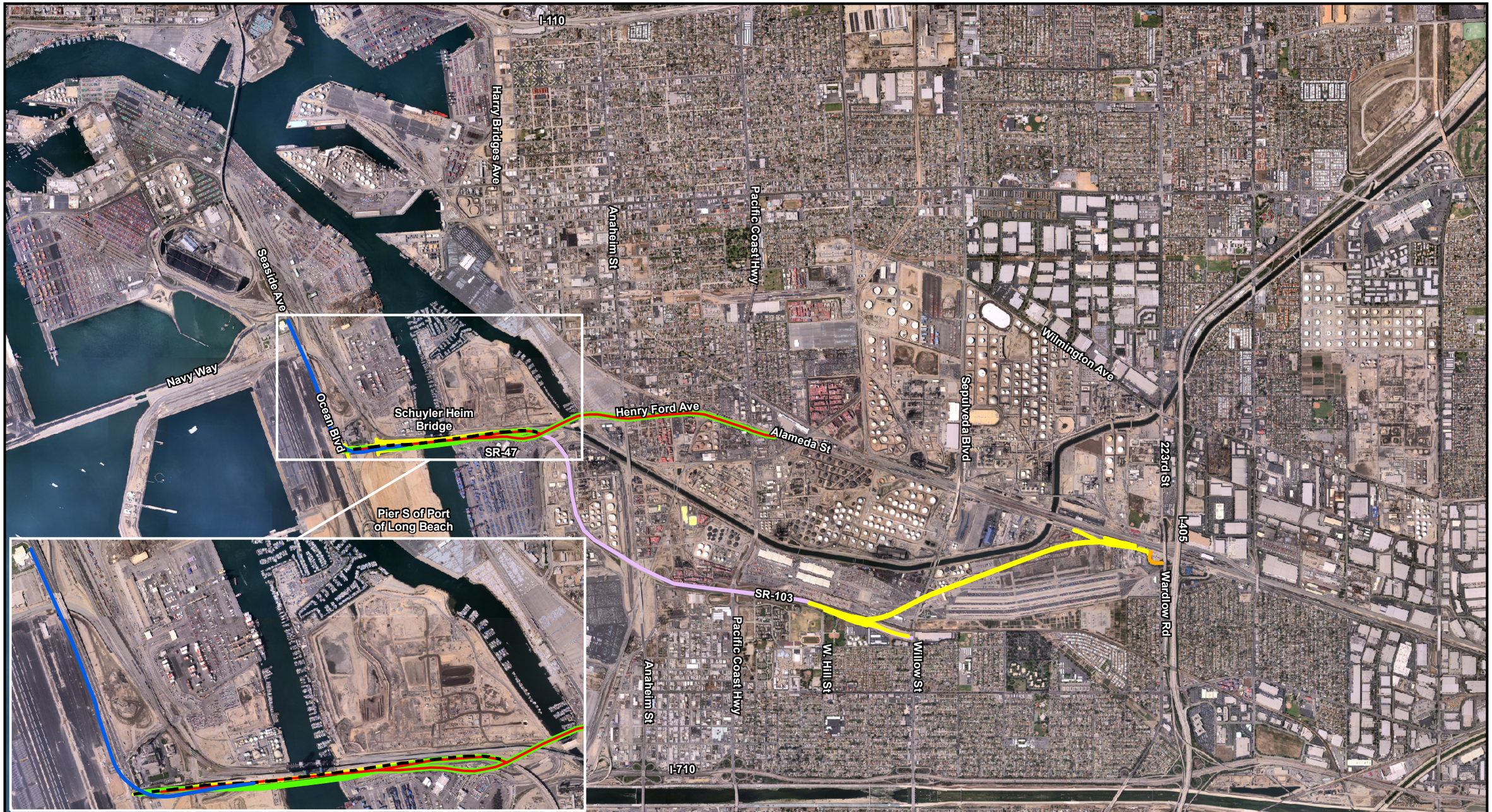
Air quality impacts directly associated with operation of the project would be less than significant. The Schuyler Heim Bridge/SR-47 project is included in the conforming 2008 RTP and the 2008 RTIP which was adopted by SCAG in July 2008. Therefore, regional air quality impacts will have been satisfied. CO, PM_{10}, and $PM_{2.5}$ "hot spot" analyses showed that the project would not cause or contribute to a local exceedance of the NAAQS.

Health risk impacts were evaluated to understand the impacts and benefits of the project in terms of localized and regional health risk. The results of the analysis indicate that the project produces substantial regional benefits that reduce risk in the majority of the study area. Acute and chronic hazard indexes would be below the significance threshold of 1 for all receptors. Under both Alternative 1 and Alternative 2, there would be an incremental increase in cancer risk for some of the residential receptors. The elevated residential cancer risk only affects a limited number of homes and feasible mitigation measures are available to reduce the risk to less than the significance thresholds. However, feasible mitigation would not be available for the significant cancer risk to recreational users under Alternative 2 and this impact would remain significant.

The replacement of the vertical lift span of the existing Schuyler Heim Bridge with a fixed-span bridge would force taller marine vessels to take a longer route around the Cerritos Channel, thereby increasing local emissions of criteria pollutants. The net change in emissions is greater than the SCAQMD significance thresholds for NO_X. Emissions of SO_X, CO, ROG, PM_{10}, and $PM_{2.5}$ would be below the operational thresholds. A positive affect of the project would be that emissions from the permanently rerouted ships would move farther away from the sensitive receptors in the community of Wilmington.

Mobile source air toxic emissions (MSATs) from operation of the project are predicted to significantly decrease over time, even though the traffic volumes and percentage of diesel trucks is expected to increase over time. The decrease in MSATs for the alternatives analyzed is consistent with the U.S. Environmental Protection Agency's (EPA's) projections that MSATs will decrease over the next 15 years due to regulations aimed at reducing these emissions from mobile sources.

Mitigation measures are proposed to reduce air quality impacts during project construction according to applicable federal, state, and SCAQMD rules. However, after mitigation, impacts from construction are expected to remain a temporary significant impact. The proposed action is not expected to directly cause any significant air quality impacts during project operation. Therefore, mitigation is not required for the project during operation. The Schuyler Heim Bridge replacement indirectly would cause a significant air quality impact of NO_X by increasing emissions from marine vessels, and mitigation measures have been identified.



LEGEND

- Alternative 1: Bridge Replacement and SR-47 Expressway
- Alternative 2: SR-103 Extension
- Alternative 3: Bridge Avoidance
- Alternative 4: Bridge Replacement Only
- Wardlow Road/223rd Street Ramp
- Ocean Boulevard/SR-47 Flyover
- Existing SR-103

0 2,800 Feet

0 1,000 Meters

Aerial Date: May 2002

Note: Project components not to scale

Figure 1
Build Alternatives
Schuyler Heim Bridge Replacement and SR-47 Expressway

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1. Introduction

1.1 Introduction

The Federal Highway Administration (FHWA) and California Department of Transportation (Caltrans) are proposing to replace the existing Commodore Schuyler F. Heim Bridge (Schuyler Heim Bridge) to meet current seismic criteria. Concurrently, the Alameda Corridor Transportation Authority (ACTA) proposes to construct an expressway along State Route (SR-) 47 or SR-103 to provide a high-capacity alternative route for traffic between Terminal Island and Interstate (I-) 405. The Schuyler Heim Bridge is located within the City and Port of Long Beach, and Terminal Island is co-located within the Port of Long Beach and Port of Los Angeles.

The proposed action is to improve traffic conditions between Terminal Island and major traffic arterials on the mainland to the north, primarily within the cities of Long Beach and Los Angeles. Six alternatives have been proposed for analysis in an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) to address the proposed action. There are four build alternatives, one Transportation System Management (TSM) alternative, and one No-Build alternative, as follows:

- Alternative 1/1A: Bridge Replacement and Expressway
- Alternative 2: SR-103 Extension to Alameda Street
- Alternative 3: Bridge Avoidance – Section 4(f)
- Alternative 4: Bridge Replacement Only
- Alternative 5: Transportation System Management
- Alternative 6: No Build

The four build alternatives are shown in Figure 1.

1.2 Project Alternatives

1.2.1 Alternative 1: Bridge Replacement and Expressway

This alternative would replace the existing Schuyler Heim Bridge to meet current seismic criteria and provide an elevated through-lane (Ocean Boulevard/SR-47 flyover) from eastbound Ocean Boulevard onto northbound SR-47. A new SR-47 Expressway would also be constructed to provide a high-capacity alternative route along the Alameda Corridor for traffic between Terminal Island and Alameda Street, south of Pacific Coast Highway. The Schuyler Heim Bridge is a major traffic route and connects Terminal Island, within the Ports of Long Beach and Los Angeles, to the mainland cities of Long Beach and Los Angeles. The bridge is located within the City of Los Angeles and through property owned by the Port of Long Beach.

With this alternative, a new fixed-span bridge would be constructed, primarily within the existing bridge right-of-way (ROW) (Caltrans Highway Easement [HE(C)]), but toward the east to avoid impacts to the railroad on the Badger Avenue Bridge immediately to the west; the existing Schuyler Heim Bridge (a lift bridge) would be demolished. The replacement bridge would be slightly wider (13 meters [m] [43 feet (ft)]) than the existing bridge due to the addition of standard shoulders, which are not present on the existing bridge. The replacement bridge would include three 3.6-m (12-ft) lanes (two through-lanes and one auxiliary lane),and 3-m (10-ft) shoulders in the northbound direction, and three 3.6-m (12-ft) lanes, one 3.6-m (12-ft) auxiliary lane, and 3-m (10-ft) shoulders in the southbound direction. Bridge construction would include a southbound off-ramp and northbound on-ramp at New Dock Street on Terminal Island, as well as a northbound off-ramp and southbound on-ramp at Henry Ford Avenue on the mainland side of the bridge. With this alternative, the new bridge would be supported by four piers in the channel, with a minimum vertical clearance of 14.3 m (47 ft) over the mean high water level (MHWL). This clearance would be maintained for the width of the navigable channel, which would be 54.9 m (180 ft).

The Ocean Boulevard/SR-47 flyover will be a two-lane, elevated structure to divert traffic bound for northbound SR-47 directly onto the new bridge from eastbound Ocean Boulevard. The purpose of the flyover is to enable this traffic to avoid the signalized Ocean Boulevard/SR-47 intersection. Under Alternative 1, the flyover will begin on Terminal Island, about 1,200 m (3,900 ft) west of the Ocean Boulevard/SR-47 intersection, extend eastward along the south side of Ocean Boulevard, then turn north, cross over Ocean Boulevard and onto the new bridge. The west end of the flyover will be at grade, then rise to a maximum elevation of 21 m (69 ft) to cross over Ocean Boulevard, then descend to an elevation of 12.9 m (42.4 ft) to join the new bridge. The elevated portions of the flyover will be supported by 8 single-column bents and 2 two-column outrigger bents. Each column is approximately 2.4 m (8 ft) in diameter. The structure will consist of 11 spans, with lengths that range between 57 m (186 ft) and 73 m (240 ft). The flyover will have an overall length of 1,550 m (5,084 ft), ending at the northerly end point (gore point) of the northbound New Dock Street on-ramp onto the bridge. The left lane of the flyover will converge with the SR-47 through-lane to the left; the right lane of the flyover will continue as a northbound SR-47 through-lane and will have the option to continue to SR-47 or SR-103. The flyover will be located entirely within the City and Port of Long Beach.

The new SR-47 Expressway would begin on Terminal Island, at the intersection of SR-47 and Ocean Boulevard, extending north over New Dock Street and onto the Schuyler Heim Bridge replacement. A new northbound on-ramp would be constructed from New Dock Street, and a new southbound off-ramp would be constructed to New Dock Street, as described above. The expressway would extend northward to Alameda Street, south of the intersection with Pacific Coast Highway, a distance of approximately 2.7 kilometers (km) (1.5 miles [mi]). The expressway would be a four-lane, limited access roadway. It would grade-separate five at-grade railroad crossings and three signalized intersections along its length. A segment of the expressway would be constructed as an elevated viaduct over Henry Ford Avenue and Alameda Street and return to grade at Alameda Street, just south of Pacific Coast Highway. Under this alternative, connectivity to SR-103 would be maintained. This alternative includes improvements to the Alameda Street/Wardlow Road connector and to Alameda Street north and south of the connector.

1.2.1.1 Alternative 1A: Haunch Bridge Design

Alternative 1A is a structural variation of Alternative 1. The main purpose of this alternative is to improve the aesthetics of the replacement bridge over the Cerritos Channel and span a greater horizontal distance across the channel between columns. This is accomplished by increasing the span lengths over the channel and arching the superstructure soffits (the bottom of the bridge structure). Under this alternative, the new bridge would be supported by two piers (four columns) in the Cerritos Channel, compared to four piers (eight columns) under Alternative 1; and the minimum vertical clearance between the piers would be of 14.3 m (47 feet). This clearance would be maintained for the width of the navigable channel, which would be 54.9 m (180 feet).

Other aspects of this alternative, including the flyover, would be the same as Alternative 1.

1.2.2 Alternative 2: SR-103 Extension to Alameda Street

With this alternative, the existing Schuyler Heim Bridge would be demolished and a new fixed-span bridge and flyover would be constructed, as described under Alternative 1. With this alternative, the right lane of the flyover would continue to SR-103 after crossing the new bridge. Additionally, modifications to the northbound and southbound approaches to the bridge would be constructed.

This alternative also would extend SR-103 to the northwest on a four-lane elevated viaduct to join Alameda Street between Sepulveda Boulevard and I-405. Improvements to SR-103 would begin approximately 3.2 km (2 mi) north of the Schuyler Heim Bridge and extend a distance of approximately 2.6 km (1.6 mi). The elevated viaduct would cross over the Union Pacific Railroad manual yard and San Pedro Branch, through the Southern California Edison (SCE) utility corridor, across the Los Angeles Harbor Department Warehouse 16/17 area, over Sepulveda Boulevard, then parallel the western boundary of the Intermodal Container Transfer Facility (ICTF) to the centerline of Alameda Street. The viaduct would slope to grade south of the Wardlow Road ramps to I-405. Improvements would be made to the existing SR-103 to accommodate the southerly end connection of the viaduct and to SR-47 to accommodate the northerly end connection of the viaduct. This alternative also includes widening the Alameda Street/Wardlow Road connector and improvements to Alameda Street north and south of the connector.

1.2.3 Alternative 3: Bridge Avoidance

This alternative would preserve the existing Schuyler Heim Bridge and a new fixed-span bridge would be constructed on an alignment east of the existing bridge; construction of the flyover would be as described for Alternative 1. Under this alternative, the new bridge would have the same lane configuration as the replacement bridge for Alternative 1.

This alternative includes seismic retrofit of the existing Schuyler Heim Bridge, which would remain standing but unused. The retrofit would be for safety purposes, to avoid demolition of a historic resource and to ensure that the existing bridge would not collapse and result in safety hazards or damage to the new bridge or to the adjacent Badger Avenue Bridge. However, according to the U.S. Coast Guard, when a bridge is no longer used for its permitted purpose of providing land transportation, the bridge shall be removed from

the waterway. Therefore, removal of the existing Schuyler Heim Bridge would be included as a condition of the federal permit for the replacement bridge.

With this alternative, a new SR-47 Expressway would be constructed north of the new fixed-span bridge, as described under Alternative 1, and connectivity with SR-103 would be maintained. Improvements to Alameda Street and the Wardlow Road connector would be the same as described under Alternative 1.

1.2.4 Alternative 4: Bridge Replacement Only

This alternative would replace the existing Schuyler Heim Bridge with a fixed-span bridge largely along the existing bridge alignment. The existing Schuyler Heim Bridge would be demolished, as would occur under Alternative 1.

With this alternative, no roadway improvements would be made. With this alternative, therefore, the SR-47 Expressway described in Alternative 1 would not be constructed; and the SR-103 extension to Alameda Street described in Alternative 2 would not be constructed. This alternative also does not include the flyover.

1.2.5 Alternative 5: Transportation System Management

This alternative is designed to identify low-cost, easily implementable improvements as an alternative to construction of more expensive improvements. For this project, the TSM alternative focuses on improvements to routes that parallel the proposed SR-47 Expressway, and that serve the same trips. These trips include trucking drayage trips to and from the ICTF, and trips destined to and from the Ports via Alameda Street, Henry Ford Avenue, and SR-47. The TSM alternative would include measures to improve capacity and traffic circulation at the Port of Long Beach and Port of Los Angeles through policy changes and use of the latest technologies. With this alternative, capital investment would be minimal compared to the previous alternatives addressed.

The TSM alternative for this project includes the following key elements:

- Intelligent Transportation Systems (ITS): Systems applications in and around the Ports areas, with special emphasis on truck movements. These include measures to improve traffic circulation through traffic control, incident management, traffic surveillance, and traffic information dissemination with the aid of ITS devices and systems.
- Lower-cost roadway and intersection improvements: Measures include restriping to provide additional turn lanes and acceleration lanes and traffic signalization improvements, primarily within existing ROWs.
- Minor roadway widening: There also could be peak-hour parking prohibitions to remove midblock bottlenecks along selected roadways.

This alternative would not result in the increased ability of the Schuyler Heim Bridge to withstand a major earthquake. In the event of a major earthquake that would render the Schuyler Heim Bridge unusable, there are only two other access routes to and from Terminal Island. In the event of the bridge becoming unusable, a TSM alternative would not be effective in reducing roadway demand or in redirecting Terminal Island traffic to other routes.

This alternative would not result in physical improvement to or replacement of the Schuyler Heim Bridge. Therefore, this alternative: (1) would not provide a link from the mainland to Terminal Island that would ensure ground and vessel transportation immediately following a major earthquake, (2) would not provide for safety improvements for bridge traffic, (3) would not improve operational or design features of the bridge, and (4) would not minimize future maintenance and operational costs of the Schuyler Heim Bridge.

1.2.6 Alternative 6: No-Build Alternative

Under this alternative, there would be changes to the existing Schuyler Heim Bridge or local roadway system. The existing Schuyler Heim Bridge would continue to be seismically inadequate and subject to damage or collapse under strong seismic conditions. Maintenance activities would continue and would include application of protective coatings, lift mechanism repairs, deck resurfacing, and other similar maintenance activities. The bridge is expected to continue to deteriorate over time as its structure is eroded further and as various magnitude earthquakes are experienced. At some point in the future, the bridge may need to be demolished and replaced solely to avoid safety hazards.

2. Regulatory Background

2.1 Air Quality Standards

The U.S. Environmental Protection Agency (EPA) adopted the Clean Air Act (CAA) in 1970 and its amendments of 1977 and 1990. Under the authority of the CAA, EPA has established nationwide air quality standards to protect public health and welfare with an adequate margin of safety. These federal standards, known as the national ambient air quality standards (NAAQS), represent the maximum allowable atmospheric concentrations and were developed for seven "criteria" pollutants: ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), particulate matter equal to or less than 10 microns in equivalent diameter (PM_{10}) and equal to or less than 2.5 microns in equivalent diameter ($PM_{2.5}$), sulfur dioxide (SO_2), and lead.

To protect human health and the environment, EPA set primary and secondary maximum ambient thresholds in the NAAQS. The primary standards particularly protect children, the elderly, and individuals in the population who suffer from chronic lung conditions (i.e., asthma and emphysema). The secondary standards were set to protect the natural environment and prevent further deterioration of animals, crops, vegetation, and buildings.

The 1977 CAA required each state to develop and maintain a State Implementation Plan (SIP) for each criteria pollutant that violates the applicable NAAQS. The SIP serves as a tool to avoid and minimize emissions of pollutants that exceed ambient thresholds and to achieve compliance with the NAAQS. In 1990, the CAA was amended to strengthen regulation of both stationary and mobile emission sources for criteria pollutants.

The California Air Resources Board (CARB) oversees California air quality policies. California ambient air quality standards (CAAQS) were established in 1969 pursuant to the Mulford-Carrell Act. These standards are generally more stringent than the NAAQS and include four additional pollutants: sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particulates. The California CAA, which was approved in 1988, requires each local air district in the state to prepare an Air Quality Management Plan (AQMP) that complies with the CAAQS. The NAAQS and CAAQS are summarized in Table 1 and represent safe levels of each pollutant to avoid specific adverse effects to human health and the environment.

The proposed action is located within the South Coast Air Basin (Basin). The South Coast Air Quality Management District (SCAQMD) is the local agency responsible for ensuring that NAAQS and CAAQS are attained and maintained in the greater Los Angeles area, which includes all or portions of Los Angeles, Orange, Riverside, and San Bernardino counties. Southern California Association of Governments (SCAG) is the federally designated Metropolitan Planning Organization (MPO) responsible for transportation planning. As such, SCAG is required to ensure that all transportation plans, programs, and projects conform with the state and federal CAAs. The six-county SCAG region has an AQMP/SIP that outlines policies and mitigation measures to achieve federal and state standards for healthful air quality in the Basin.

TABLE 1
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
			Primary[c]	Secondary[d]
O_3	8 Hours	0.07 ppm [e]	0.075 ppm	0.08 ppm
	1 Hour	0.09 ppm	— [f]	— [f]
CO	8 Hours	9.0 ppm	9 ppm	—
	1 Hour	20 ppm	35 ppm	—
NO_2	Annual Average	0.03 ppm [g]	0.053 ppm	0.053 ppm
	1 Hour	0.18 ppm [g]	—	—
$S0_2$	Annual Average	—	0.030 ppm	—
	24 Hours	0.04 ppm	0.14 ppm	—
	3 Hours	—	—	0.5 ppm
	1 Hour	0.25 ppm	—	—
$PM_{2.5}$	Annual Geometric Mean	12 μg/m^3	15 μg/m^3	15 μg/m^3
	24 Hours	—	35 μg/m^3	35 μg/m^3
PM_{10}	Annual Arithmetic Mean	20 μg/m^3	—	—
	24 Hours	50 μg/m^3	150 μg/m^3	150 μg/m^3
Lead	30-Day Average	1.5 μg/m^3	—	—
	Calendar Quarter	—	1.5 μg/m^3	1.5 μg/m^3
Sulfates	24 Hours	25 μg/m^3	—	—
Hydrogen Sulfide	1 Hour	0.03 ppm	—	—
Vinyl Chloride	24 Hours	0.010 ppm	—	—
Visibility-Reducing Particles	8 Hours (10 AM to 6 PM, PST)	See Note [g]	—	—

Notes:

[a] California standards for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, PM_{10}, $PM_{2.5}$, and visibility-reducing particles are values that are not to be exceeded. The standards for sulfates, lead, hydrogen sulfide, and vinyl chloride are not to be equaled or exceeded.

[b] National standards, other than ozone and those based on annual averages or annual arithmetic means, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than 1.

[c] National Primary Standards represent the levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[d] National Secondary Standards represent the levels of air quality necessary to protect the environment, including public welfare, from any known or anticipated adverse effects of a pollutant.

[e] On June 15, 2005, the 1-hour ozone standard of 0.12 parts per million (ppm) was revoked for all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) areas. (Those areas do not yet have an effective date for their 8-hour designations.)

[f] A sufficient amount to produce an extinction coefficient of 0.23 per km due to particles when the relative humidity is less than 70 percent.

[g] The California air quality standards for NO_2 were amended on February 22, 2007 to lower the 1-hr standard to 0.18 ppm and establish a new annual standard of 0.03 ppm. These changes became effective on March 20, 2008.

ppm parts per million by volume

PST Pacific Standard Time

μg/m^3 micrograms per cubic meter

Source: CARB, 2007 (http://www.arb.ca.gov/aqs/aqs.htm), updated 02/22/2007

The most recent EPA-approved South Coast SIPs are the 1997 Air Quality Management Plan (SCAQMD, 1997) and the *1999 Amendment to the 1997 Ozone AQMP Revision for the South Coast Air Basin and Settlement Agreement on the 1994 Ozone SIP Litigation* (SCAQMD, 1999).

The 2003 AQMP/SIP for the SCAG region was approved by the SCAQMD Board of Directors and CARB in 2003 (SCAQMD, 2003). The 2003 AQMP was submitted to EPA for approval on January 9, 2004. On March 25, 2004, EPA found the South Coast SIP budgets in the 2003 AQMP for transportation projects to be adequate (FR Vol. 69, No. 58, 15325). The most recent AQMP, the 2007 Final AQMP/SIP (SCAQMD, 2007), was adopted by the AQMD Board on June 1, 2007. On September 27, 2007, the ARB Board adopted the State Strategy for the 2007 SIP and the 2007 SCAQMD Plan as part of the SIP. The final 2007 AQMP, along with the transportation conformity budgets of SCAB, were submitted to EPA for approval on November 28, 2007.

2.2 Transportation Conformity

Transportation conformity is an analytical process required for all federally funded transportation projects in California. Air quality provisions in the CAA, transportation planning provisions of Title 23 and Title 49 of the United States Code (U.S.C.), and Title 40 of the Code of Federal Regulations (CFR) Parts 51 and 93 are intended to ensure that integrated transportation and air quality planning occurs in the areas designated by EPA as nonattainment or maintenance areas for ambient levels of CO, O_3, $PM_{2.5}$, and PM_{10}. The transportation conformity process establishes the major connection between transportation planning and emission reductions from transportation sources. To further bridge the gap, the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 (revised in 1998 as TEA-21) linked compliance with conformity requirements to continued FHWA and Federal Transit Administration (FTA) funding of transportation plans, programs, and projects. These requirements were not changed with enactment of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) on August 10, 2005. The revised planning requirements set forth in SAFETEA-LU require SCAG to develop, update, and maintain the RTP on a 4-year cycle. Pursuant to the 1990 CAA, the U.S. Department of Transportation cannot fund, authorize, or approve federal actions to programs or projects that do not conform to CAA requirements.

SCAG is the MPO for the Basin, which is made of six counties including Los Angeles County. The Basin has been designated by EPA as a federal nonattainment area for O_3 and PM_{10}. Part of Los Angles County, including the project area, has been designated as nonattainment for $PM_{2.5}$. The Basin was re-designated by EPA as an attainment/ maintenance area for CO in June 2007. The CAA amendments of 1990 require that federally funded transportation plans, programs, and projects in nonattainment areas complete a regional and project-level conformity analysis and meet the amendment requirements to receive federal funding. A brief outline of the regional and project-level conformity process follows.

2.2.1 Regional Conformity Determination

SAFETEA-LU requires that SCAG develop a Regional Transportation Plan (RTP) for a 20-year minimum period, and a Regional Transportation Improvement Program (RTIP) to

implement the RTP. In the federal nonattainment or maintenance areas, the RTP and RTIP must comply with the requirements of the EPA Transportation Conformity Rule. The RTIP is updated every 2 years, and the RTP is revised every 4 years. In meeting the requirements of a conformity determination, both the RTP and the RTIP must demonstrate consistency with the SIP emissions budgets. The RTIP also must undergo a financial constraints analysis, an interagency consultation, and public involvement.

2.2.1.1 Regional Emissions Budgets

The EPA Transportation Conformity Rule requires that the RTIP regional emissions be consistent with the motor vehicle emissions budgets in the applicable SIPs. For a regional conformity determination, the projects must have demonstrated that combined projected emissions of CO, PM_{10}, $PM_{2.5}$, and O_3 precursors are below the emission budgets outlined in each respective SIP.

The South Coast SIP is based on the 2007 AQMP prepared jointly by CARB, SCAG, and SCAQMD. The final 2008 RTP and Adopted 2008 RTIP are consistent with all applicable emission budgets in the SCAQMD 2007 AQMP. The final 2007 AQMP, along with the transportation conformity budgets developed by SCAG, were submitted to EPA for approval on November 28, 2007.

2.2.1.2 Timely Implementation of Transportation Control Measures

The TCMs are included in the O_3, $PM_{2.5}$, and PM_{10} SIPs. Once the project is in a conforming RTIP/TIP, the project is eligible to take credit for the implementation of TCMs outlined in the SIPs.

Following are specific requirements to demonstrate timely implementation of TCMs.

- The program must demonstrate that all applicable TCMs are on schedule, with any past problems corrected, and that all delayed TCMs are given maximum priority for funding approval
- The program must not interfere with the implementation of any TCM

2.2.1.3 Financial Constraint Analysis

The financial constraint analysis is a funding issue demonstrated by available funding. All funding issues need to be resolved prior to inclusion in the TIP. The funding requirement was established with ISTEA and the TEA-21 and SAFETEA-LU revisions.

The RTIP includes a financial plan that demonstrates it is financially constrained, and the first 2 years of funding are committed in a federally approved RTP.

SCAG determined that the projects programmed in the 2008 RTIP for fiscal years 2008/2009 and 2009/2010 are fiscally constrained and, for the remaining years, the funds are reasonably expected to be available.

2.2.1.4 Interagency Consultation and Public Involvement

In developing the RTIP, SCAG must work closely with city, state, federal, and county agencies and with the general public.

The Adopted 2008 RTIP complies with all federal and state requirements for interagency consultation and public involvement. The Adopted 2008 RTIP was released for a 30-day public review period, and SCAG provided responses to the written comments. As of October 2008, the 2008 RTIP is pending approval by federal and state agencies.

2.2.2 Project-Level Conformity

The project-level transportation conformity determination is addressed in this document. The following items are required to satisfy project-level conformity:

- The project is in a conforming RTP and RTIP
- The design concept and scope that were in place at the time of the conformity finding are maintained through implementation
- The project design concept and scope must be defined sufficiently to determine emissions at the time of the conformity determination
- The project must not cause a new local violation of the federal standards for CO PM_{10}, $PM_{2.5}$, or exacerbate an existing violation

2.2.3 Applicability to the Proposed Action

The proposed action, the Schuyler Heim Bridge replacement and SR-47 Expressway, is subject to transportation conformity requirement, as well as National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) evaluation. The design and scope of the Schuyler Heim Bridge/SR-47 project is included in the conforming 2008 RTP and the Adopted 2008 RTIP as project ID LA0D45. Appendices O and P contain the 2008 RTP and Adopted 2008 RTIP showing inclusion of the proposed project.

The proposed project, as described above, is fully funded and is in the conforming 2008 RTP. The project also is included in the financially constrained SCAG 2008 RTIP of State Highway Projects.

Project-level conformity of the project alternatives is addressed in Section 4 of this document.

2.3 Mobile Source Air Toxics

2.3.1 Regulatory Background

The CAA identified 188 air toxics, also known as hazardous air pollutants. EPA has assessed this expansive list of toxics and identified a group of 21 as mobile source air toxics, which are set forth in an EPA final rule, *Control of Emissions of Hazardous Air Pollutants from Mobile Sources* (66 FR 17235). EPA also extracted a subset of this list of 21 that it now labels as the six priority mobile source air toxics (MSATs). These are benzene, formaldehyde, acetaldehyde, diesel particulate matter (DPM)/diesel exhaust organic gases, acrolein, and 1,3-butadiene.

Currently, there are no established criteria for determining when MSAT emissions should be considered a significant issue in the NEPA context. For the purpose of the MSAT impact evaluation under NEPA, the FHWA has developed a tiered approach for analyzing MSATs. FHWA has identified three levels of analysis depending on a project's specific circumstances and potential MSAT impacts: (1) no analysis for projects with no potential for meaningful

MSAT effects; (2) qualitative analysis for projects with low potential MSAT effects; and (3) quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects.

2.3.2 Applicability of the Project

The proposed action will modify roadways that are linked to a major freight facility (Port of Long Beach), and, therefore, has the potential to carry a significant number of diesel-fuel vehicles, a primary source of DPM. As a result, the MSAT analysis for the Schuyler Heim Bridge/SR-47 project was determined to be a Level 3 quantitative analysis (for projects with higher potential MSAT effects). The analysis will follow the FHWA's Interim Guidance on Air Toxics (FHWA, 2006).

2.4 Health Risk Assessment

The Alameda Corridor Transportation Authority (ACTA) has elected to perform a health risk assessment for the proposed Schuyler Heim Bridge Replacement and SR-47 Expressway project (the "project") as part of its funded portion of the project. The proposed project is intended to improve goods movement in the ports of Los Angeles and Long Beach, which would reduce emissions from trucks and other motor vehicles calling on the ports. However, by relocating some vehicle trips from existing traffic corridors to the truck expressway portion of the project, the project could result in localized health impacts in some areas. The purpose of the Health Risk Assessment (HRA) was to understand the impacts and benefits of the project both in terms of localized and regional health risk. The HRA focused on a broad geographic area, extending roughly 7.5 miles due north from the Schuyler Heim Bridge and over 5 miles north from the end of the actual improvements at Alameda Street and Pacific Coast Highway. A summary of the HRA results are presented in Section 4.4.7 and Appendix Q contains the entire HRA.

2.5 Greenhouse Gas

Recently, California has also enacted regulations for emissions of greenhouse gases (GHGs), which contribute to climate change. While climate change has been a concern since at least 1988, as evidenced by establishment of the United Nations and World Meteorological Organization's Intergovernmental Panel on Climate Change (IPCC), the efforts devoted to GHG emissions reduction and climate change research and policy have increased dramatically in recent years. In 2002, with the passage of Assembly Bill 1493 (AB 1493), California launched an innovative and pro-active approach to dealing with GHG emissions and climate change at the state level. AB 1493 requires the ARB to develop and implement regulations to reduce automobile and light truck GHG emissions; these regulations will apply to automobiles and light trucks beginning with the 2009 model year. In order to implement vehicle emission standards under AB 1493, ARB requested a waiver from the EPA to establish emissions standards stricter than the federal emissions standards. On December 19, 2007, EPA denied the ARB request for a waiver. On January 2, 2008, the California Attorney General filed suit against the EPA to challenge EPA's refusal to grant

California a waiver under the Clean Air Act to permit California to enforce stricter emission reduction standards. The lawsuit is currently pending.

In addition, on June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. The goal of this Executive Order is to reduce California's GHG emissions to: 1) 2000 levels by 2010, 2) 1990 levels by the 2020 and 3) 80 percent below the 1990 levels by the year 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006. AB 32 sets the same overall GHG emissions reduction goals while further mandating that ARB create a plan, which includes market mechanisms, and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the state's Climate Action Team.

2.6 Fugitive Dust Rule

SCAQMD Rule 403 (Fugitive Dust) requires specific actions or measures to prevent, reduce, or mitigate particulate matter emissions generated from man-made fugitive dust sources. Required actions for each fugitive dust source within the active operation are listed in Rule 403 Table 1, Best Available Control Measures. Additional requirements for large operations with 50 acres or more of disturbed surface area, or with a daily earth-moving or throughput volume of 5,000 cubic yards, are listed in Rule 403 Tables 2 and 3. However, the requirements for larger operations do not apply to this project.

3. Affected Environment

3.1 Climate

The project site is in the westernmost portion of the Basin in Los Angeles County. The Basin experiences a mild and fairly dry climate, with mean average temperatures ranging from the approximately 55 degrees Fahrenheit (°F) in the winter to approximately 83°F during the summer. Average annual rainfall ranges from 9 to 14 inches, occurring primarily during a 5-month period between November and March. Average wind speeds in the Basin are light and primarily from the west. The normal daily wind pattern is characterized by a daytime sea breeze and a weak nighttime land breeze. Region-wide elevated temperature inversions are common in the Basin and can occur at any time of the year. The usually mild climatological pattern of the area is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds. Elevated terrain to the north and east of the Basin, combined with temperature inversions and low wind speeds, often results in very poor air circulation of the area and, consequently, poor air quality. Air quality is generally worse in the eastern portion of the Basin, where emissions from the metropolitan area of Los Angeles can accumulate. Consequently, coastal locations of the Basin generally experience much better air quality than the rest of the area.

The concentration of a pollutant in the atmosphere is dependent on the amount of pollutant released, the nature of the source, and the ability of the atmosphere to transport and disperse the pollutant. The main determinants of transport and dispersion are wind, atmospheric stability, topography, and solar radiation for some photochemically active pollutants.

The potential for high pollution levels varies seasonally for many contaminants. In the summer, longer daylight hours and more intense sunlight combine to cause a reaction between ROG and NO_X to form photochemical oxidants, mainly O_3. In the winter, high levels of CO can exist because of extremely low inversions, causing air stagnation during the late night and early morning hours. When strong inversions are formed on winter nights and are coupled with near-calm winds, CO from automobile exhausts can become highly concentrated.

Ambient air quality in Long Beach is somewhat better than much of the Basin because of its coastal location. Average wind speeds and ventilation near the coast are greater than in the inland areas.

3.2 Existing Air Quality

3.2.1 Sensitive Receptors

The immediate vicinity of the project area includes the Port of Long Beach and the community of Wilmington in Los Angeles. The community of Wilmington is just west of the proposed SR-47 Expressway and includes sensitive air quality receptors such as residences,

schools, and hospitals. The nearest hospital is located about 1.4 miles northwest of the north end of the proposed SR-47 Expressway. The nearest residences are approximately 100 feet west of the SR-47 Expressway near Alameda Street and Henry Ford Avenue. The school nearest to the proposed project is the Wilmington Park School at 1140 Mahar Avenue, approximately 700 feet west of the connection of proposed SR-47 and Alameda Street. Other schools in the area include:

- Holy Family Grammar School (1122 Roubidoux)
- Phineas Banning High School (1527 Lakme Avenue)
- Bonita Street Elementary School (21929 Bonita Street)
- Webster Elementary School (1755 West 32 Way)
- Elizabeth Hudson Elementary School (2335 Webster Avenue)
- Muir Elementary School (3038 Delta Avenue)
- California Heights Parent Participation Nursery School (1500 East Carson Street)
- Reid High School (2152 West Hill Street)
- Mary McLeod Bethune Child Development Center (2041 San Gabriel Avenue)
- Stephens William Logan Middle School (1830 West Columbia Street)
- Cabrillo High School (2001 Santa Fe Avenue)

People are living aboard moored vessels in the marina to the west of the Schuyler Heim and Henry Ford bridges. Along the northern border of the project area, there are residences located in the City of Carson between Dominguez Street and I-405. The Long Beach Silverado Senior Center also is located near the project area at 1545 West 31st Street.

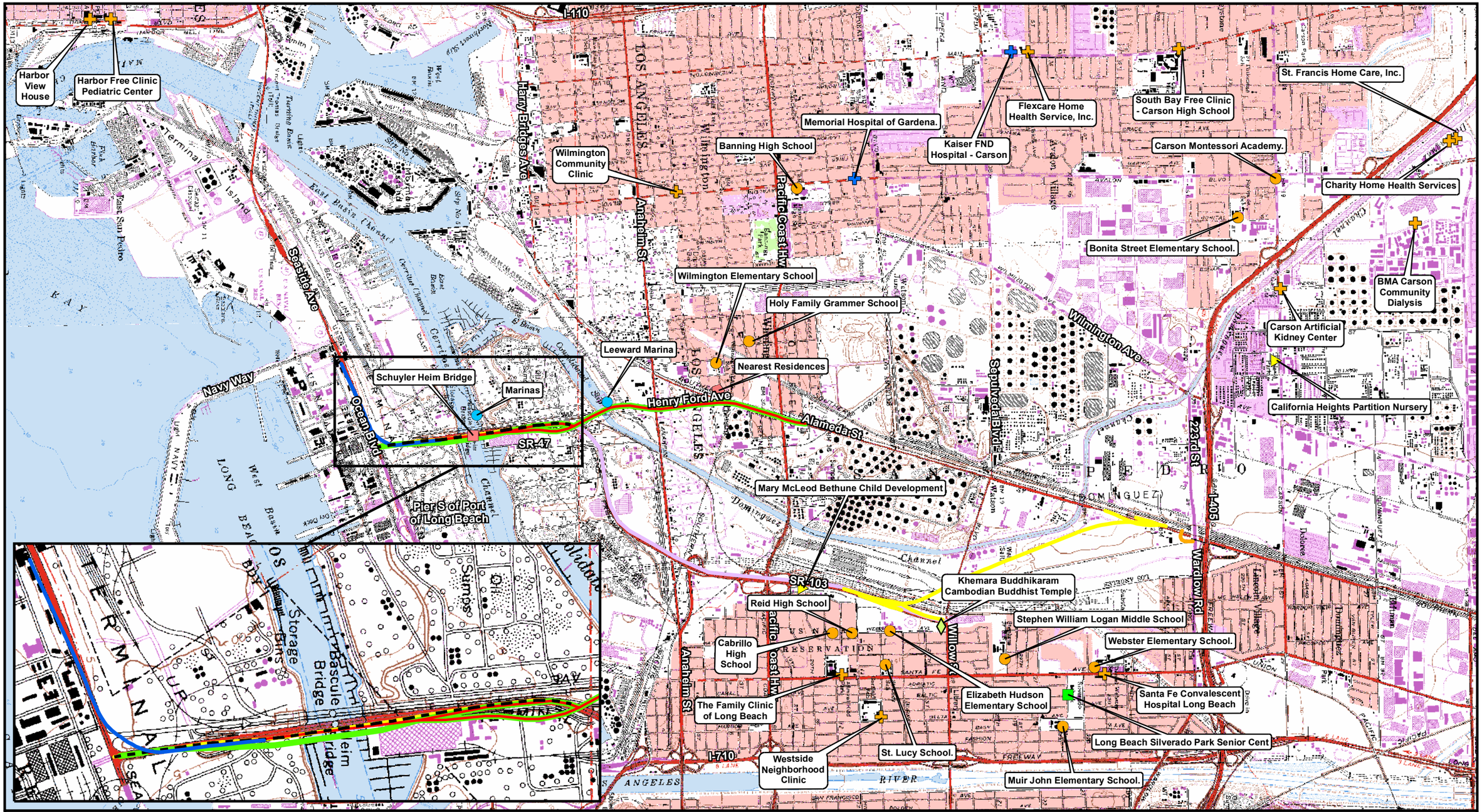
The existing air quality described below is representative of the existing conditions at the sensitive receptors of the community of Wilmington, the nearest schools, and the marina. Figure 2 is a map of the project area that shows the locations of the sensitive air quality receptors relative to the project.

3.2.2 Ambient Air Quality

The following provides a summary of the criteria pollutants and monitoring data for the time period 2004 through 2006, a description of mobile source air toxics, and a description of greenhouse gases.

3.2.2.1 Criteria Pollutants

In conjunction with EPA, the SCAQMD operates a network of ambient air quality monitoring stations in the Basin. The North Long Beach Monitoring Station is the closest one to the project area (approximately 5 miles northeast of Schuyler Heim Bridge) and provides ambient air quality data representative of local conditions. The North Long Beach station monitors CO, O_3, SO_2, NO_2, $PM_{2.5}$, and PM_{10}. Ambient air quality data for the monitoring years of 2004, 2005, and 2006 are summarized in Table 2, which lists maximum pollutant levels measured and the number of days each year the ambient concentrations were above federal and state standards at the North Long Beach Monitoring Station.



LEGEND

- Alternative 1: Bridge Replacement and SR-47 Expressway
- Alternative 2: SR-103 Extension
- Alternative 3: Bridge Avoidance
- Alternative 4: Bridge Replacement Only
- Wardlow Road/223rd Street Ramp
- Ocean Bloulevard/SR-47 Flyover
- Existing SR-103
- Hospital
- Marina
- Nursery
- Residence
- School
- Senior Center
- Bridge
- Licensed Healthcare Facilities
- Khemara Buddhikaram Cambodian Buddhist Temple

0 2,800 Feet

0 1,000 Meters

Figure 2
Sensitive Receptors
Schuyler Heim Bridge Replacement and SR-47 Expressway

CH2MHILL

Aerial Date: February 2006, AirPhotoUSA

Note: Project components not to scale

\\galt\proj\AlamedaCorridorEng\320265\MapFiles\11x17L_acet_sensitivereceptors_v1.mxd 1/8/2007

TABLE 2
Summary of Maximum Ambient Air Monitoring Levels

Pollutant	Averaging Time	2001	2002	2003	2004	2005	2006
CO (ppm)	1-Hour	6.0	5.8	5.5	4.2	4.2	4.2
	Days of State Exceedance	0	0	0	0	0	0
	Days of Federal Exceedance	0	0	0	0	0	0
	8-Hour	4.74	4.56	4.66	3.37	3.51	3.36
	Days of State Exceedance	0	0	0	0	0	0
	Days of Federal Exceedance	0	0	0	0	0	0
O_3 (ppm)	1-Hour	0.091	0.084	0.099	0.090	0.091	0.081
	Days of State Exceedance	0	0	1	0	0	0
	8-Hour	0.070	0.064	0.068	0.074	0.069	0.058
	Days of State Exceedance	--	--	--	--	--	--
	Days of Federal Exceedance	0	0	0	0	0	0
NO_2 (ppm)	Annual Average	0.030	0.029	0.029	0.028	0.024	0.022
	Federal Exceedance	0	0	0	0	0	0
	1-Hour	0.122	0.130	0.135	0.121	0.136	0.102
	Days of State Exceedance	0	0	0	0	0	0
SO_2 (ppm)	Annual Average	0.002	0.002	0.002	0.005	0.002	0.001
	Federal Exceedance	0	0	0	0	0	0
	24-Hour	0.009	0.008	0.008	0.013	0.010	0.010
	Days of State Exceedance	0	0	0	0	0	0
	Days of Federal Exceedance	0	0	0	0	0	0
	3-Hour	0.027	0.026	0.020	0.026	0.033	0.023
	Days of Federal Exceedance	0	0	0	0	0	0
	1-Hour	0.047	0.030	0.033	0.042	0.041	0.027
	Days of State Exceedance	0	0	0	0	0	0

TABLE 2
Summary of Maximum Ambient Air Monitoring Levels

Pollutant	Averaging Time	2001	2002	2003	2004	2005	2006
PM_{10} ($\mu g/m^3$)	Annual Arithmetic Mean	37	36	33	33	30	31
	State Exceedance	1	1	1	1	1	1
	24-Hour	91	74	63	72	66	78
	Days of State Exceedance	10	5	4	5	4	5
	Days of Federal Exceedance	0	0	0	0	0	0
$PM_{2.5}$ ($\mu g/m^3$)	Annual Arithmetic Mean	21.2	19.5	18	17.9	15.9	14.1
	State Exceedance	1	1	1	1	1	1
	Federal Exceedance	1	1	1	1	1	0
	24-Hour	72.9	62.7	115.2	66.6	53.8	58.5
	Days of Federal Exceedance	1	0	3	1	0	0

Notes:
1. Monitoring data from the North Long Beach Monitoring Station (060374002) monitor.
2. Hydrogen sulfide, vinyl chloride, and visibility-reducing particles are not monitored.
ppmparts per million
$\mu g/m^3$ micrograms per cubic meter
Source: CARB, 2007b, www.arb.ca.gov/adam/welcome, as of July 2007
EPA, 2007, www.epa.gov/air/data, as of July 2007

CO

Ambient concentrations of CO were 4.2 ppm for the 1-hour average and from 3.4 to 4.7 ppm for the 8-hour average during the last 3 years. The state and federal CO standards for the years 2004 to 2006, inclusive, have not been exceeded at the North Long Beach station.

O_3

Ambient concentrations of 1-hour O_3 measured at the North Long Beach station for the observation years 2004 to 2006, inclusive, range from 0.081 to 0.090 ppm. There was no exceedance of the state standard for 1-hour average O_3 concentration. There were no violations of the federal standard during these years.

SO_2

The maximum 1-hour SO_2 concentration measured at the North Long Beach station during period from 2004 to 2006 was 0.042 ppm in 2004. The 24-hour average concentration ranged from 0.010 to 0.013 ppm during the last 3 years. The state and federal standards for SO_2 during the years 2004 to 2006, inclusive, were not exceeded.

NO_2

The annual average concentrations measured at the North Long Beach station ranged from 0.022 to 0.028 ppm for the years 2004 through 2006. The 1-hour average concentrations ranged from 0.102 to 0.136 ppm during 2004 to 2006. The state and federal NO_2 standards for the years 2004 to 2006, inclusive, were not exceeded at the Long Beach station.

PM_{10}

The maximum 24-hour PM_{10} concentration measured at the North Long Beach station during the years 2004 to 2006, inclusive, was 78 micrograms per cubic meter ($\mu g/m^3$). The maximum annual concentration (arithmetic mean) for the same time period was 33 $\mu g/m^3$. The state standard for a 24-hour average PM_{10} concentration was exceeded on 13 days during the years 2004 to 2006, while the federal standard for 24-hour average PM_{10} concentration for the same time period was not exceeded.

PM_{10} monitoring data are available from other stations near the project site. SCAQMD operates three monitoring stations in the Long Beach and Wilmington area at Hudson School, Edison Elementary School, and the Wilmington Childcare Center for the Rule 1158 study (SCAQMD, 2005). The monitoring data indicated that the PM_{10} concentrations at Hudson School site were higher than at the other stations. The monitoring data also indicated that the PM_{10} concentrations were decreasing over the past years at all three stations.

$PM_{2.5}$

The maximum 24-hour $PM_{2.5}$ concentration measured at the North Long Beach station during the years 2004 to 2006, inclusive, was 66.6 $\mu g/m^3$. The maximum annual concentration (arithmetic mean) for the same time period was 17.9 $\mu g/m^3$. The state standard for the $PM_{2.5}$ annual average concentration was exceeded in all 3 years, while the federal standard was exceeded in 2 of the 3 years.

3.2.2.2 Attainment Status

The federal CAA requires EPA to classify areas in the country as attainment or nonattainment, with respect to each criteria pollutant, depending on whether the areas

meet the national standards. Similarly, the California CAA requires the CARB to classify areas in the state as attainment or nonattainment, depending on whether the areas meet the California standards. Both acts require areas designated as nonattainment to prepare comprehensive attainment plans that contain a strategy and time frame for meeting the standards. In each state, attainment plans prepared pursuant to the federal CAA are incorporated in a single SIP.

Table 3 displays current air quality designations for Los Angeles County, which includes the project area. It is the responsibility of the SCAQMD to lead the regional effort in the Basin to attain state and federal standards. The SCAQMD is charged with the overall development and implementation of the AQMP and with reducing emissions from industries and some mobile sources and consumer products. The SCAG is responsible for the AQMP land use and transportation control measures as well as for determining the conformity of regionally significant projects.

TABLE 3
State and Federal Air Quality Designations for the Project Area (as of December 6, 2006)

Pollutant	State Designation	Federal Designation
Ozone (8-hour)	Nonattainment	Severe Nonattainment
Ozone (1 hour)	Nonattainment	Revoked [70 FR 44470] [1]
PM_{10}	Nonattainment	Serious Nonattainment
$PM_{2.5}$	Nonattainment	Nonattainment
CO	Attainment	Attainment/Maintenance
All Others	Attainment/Unclassified	Attainment/Unclassified

Notes:
1. On June 15, 2005, the 1-hour ozone standard of 0.12 ppm was revoked for all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) areas. (Those areas do not yet have an effective date for their 8-hour designations.)
2. Data source: CARB, 2004 State Area Designations, http://www.arb.ca.gov/desig/desig.htm, accessed in July 2007, and EPA, www.epa.gov/air/oaqps/greenbk/index.html, federal designation as of June 20, 2007.

3.2.2.3 Mobile Source Air Toxics

In addition to criteria pollutants, mobile source air toxics (MSAT) are another group of pollutants of concern in the South Coast Air Basin. The six priority MSATs are benzene, formaldehyde, acetaldehyde, diesel particulate matter (DPM)/diesel exhaust organic gases, acrolein, and 1,3-butadiene. The EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The EPA Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The following toxicity information for the six prioritized MSATs was taken from the IRIS database Weight of Evidence Characterization summaries. This information is taken verbatim from EPA's IRIS database and represents EPA's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures.

- Benzene is characterized as a known human carcinogen.

- The potential carcinogenicity of acrolein cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.
- Formaldehyde is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.
- 1,3-butadiene is characterized as carcinogenic to humans by inhalation.
- Acetaldehyde is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.
- Diesel exhaust (DE) is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases.

Diesel exhaust also represents chronic respiratory effects, possibly the primary noncancer hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms such as cough, phlegm, and chronic bronchitis.

The SCAQMD recently completed the Multiple Air Toxics Exposure Study III (MATES-III), which is a monitoring and risk evaluation study conducted periodically in the South Coast Air Basin (SCAQMD, 2008). The MATES-III study included a monitoring program, an updated emissions inventory of TACs, and a modeling effort to characterize risk across the Basin (SCAQMD, 2008). Compared to previous studies of air toxics in the Basin, the MATES-III study found decreasing risks for air toxics exposures (SCAQMD, 2008). Although the study showed that exposures to emissions of air toxics are being reduced overall, the study concluded that the risks remain unacceptable, and are higher near areas such as the ports and transportation corridors (SCAQMD, 2008). The highest risks were found near the port area, in areas near central Los Angeles, and in areas near transportation corridors (SCAQMD, 2008).

In addition to the MATES-III study, the following studies also correlated adverse health impacts from exposure to diesel particulate matter near the Ports and roadways:

- California Air Resources Board. 2006. Final Diesel Particulate Matter Exposure Assessment Study for the Ports of Los Angeles and Long Beach.
- Green, R.S. Smorodinsky S., Kim J.J., et al. Proximity of California Public Schools to Busy Roads. January 2004. Environmental Health Perspectives 2004; 112:61-66.
- Kim J.J., Smorodinsky S, Lipsett M., et al. Traffic-Related Air Pollution Near Busy Roads. The East Bay Children's Respiratory Health Study. June 2004. American Journal Respir Crit Care Med 2004; 170:520-526.
- Zhu Y., Hinds W., Kim S., Sioutas C. Concentration and Size Distribution of Ultrafine Particles Near a Major Highway. Journal of Air and Waste Management Association. September 2002. 52: 1032-1042.

There have also been several other monitoring studies in the area near the proposed project. The ARB conducted a special Community Air Quality Monitoring Study in which monitoring data and potential cancer risks at the Wilmington School and North Long Beach

stations were evaluated, with the exception of risks identified for diesel PM_{10} (ARB, 2003). The study found that PM_{10} concentrations measured at Wilmington School were higher than the levels measured at the North Long Beach station (ARB, 2003). The following are additional references of completed monitoring studies and on-going monitoring near the proposed project:

- SCAQMD MATES-III Study included ten monitoring sites. The monitoring data is available here: http://www.aqmd.gov/prdas/matesIII/matesIII.html
- SCAQMD Rule 1158 studies which include monitoring data from Elizabeth Hudson Elementary School. These studies are available here: http://www.aqmd.gov/tao/Rule1158Studies.htm
- The Port of Los Angeles air quality monitoring stations includes two community stations; one station is the Wilmington Community Station and the other station is the San Pedro Community Station. These monitoring stations have been operational since February 2005. The monitoring data is available here: http://www.portoflosangeles.org/environment_aqm_results.htm
- ARB monitors toxics at the North Long Beach Station. Information about the monitoring network and monitoring data is available here: http://www.arb.ca.gov/aaqm/toxics.htm

3.2.2.4 Greenhouse Gases

Another category of pollutants included as part of the ambient air discussion is greenhouse gases. Greenhouse gases (GHG) include the following pollutants (EPA, 2007):

- Carbon dioxide (CO_2) is a naturally occurring gas, and also a by-product of burning fossil fuels and biomass, as well as land-use changes, and other industrial processes. It is the principal anthropogenic greenhouse gas that affects the Earth's radiative balance.
- Methane (CH_4) is a greenhouse gas with a global warming potential most recently estimated at 23 times that of CO_2. CH_4 is produced through anaerobic (without oxygen) decomposition of waste in landfills, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.
- Nitrous oxide (N_2O) is a greenhouse gas with a global warming potential of 296 times that of CO_2. Major sources of nitrous oxide include soil cultivation practices, especially the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning.
- Hydrofluorocarbons (HFCs) are compounds containing only hydrogen, fluorine, chlorine, and carbon. HFCs have been introduced as a replacement for the chlorofluorocarbons identified as ozone depleting substances.
- Perfluorocarbons (PFCs) are compounds containing only fluorine and carbon. Similar to HFCs, PFCs have been introduced as a replacement for chlorofluorocarbons. PFCs are also used in manufacturing and emitted as by-products of industrial processes. PFCs are powerful greenhouse gases.

- Sulfur hexafluoride (SF_6) is a colorless gas soluble in alcohol and ether, and slightly soluble in water. SF_6 is a very powerful greenhouse gas used primarily in electrical transmission and distribution systems, as well as dielectrics in electronics.

Caltrans and its parent agency, the Business, Transportation, and Housing Agency, have taken an active role in addressing GHG emission reduction and climate change. Recognizing that 98 percent of California's GHG emissions are from the burning of fossil fuels, and 40 percent of all human made GHG emissions are from transportation, Caltrans has created and is implementing the Climate Action Program at Caltrans (Caltrans, 2006). One of the main strategies in this program to reduce GHG emissions is to make California's transportation system more efficient. The highest levels of carbon dioxide from mobile sources, such as automobiles, occur at stop-and-go speeds (0-25 miles per hour) and speeds over 55 mph. Relieving congestion by enhancing operations and improving travel times in high congestion travel corridors will lead to an overall reduction in GHG emissions. The proposed project would be expected to relieve congestion and improve travel times, which may result in an overall reduction of GHG emissions.

4. Environmental Consequences

4.1 Introduction

Implementation of the project alternatives would result in potential air quality impacts during project construction and operations. During project construction, onsite operation of heavy-duty construction equipment would generate emissions of vehicle exhaust containing pollutants such as, and CO, NO_X, ROG, SO_X, PM_{10}, $PM_{2.5}$. Earth-moving activities would generate emissions of PM_{10} and $PM_{2.5}$ as fugitive dust. Offsite vehicle trips made by employees and supply trucks would generate additional vehicle exhaust emissions. Asphalt paving would be a source of ROG emissions. Closure and restrictions of the Schuyler Heim Bridge during demolition and construction would cause rerouting of automobile and marine traffic, with associated emission increases. This report includes the quantification of construction-related emissions and comparison to thresholds of significance established by the SCAQMD.

Potential air quality impacts during project operations would be associated with the redistribution of traffic along the Alameda Corridor with the addition of the new expressway. Two types of impacts could be created from a redistribution of traffic. First, incremental changes in average vehicle speeds and vehicle-miles traveled (VMT) along the affected roadways could change the overall magnitude of vehicle exhaust emissions throughout the project area. A change in overall emissions would affect air quality on a regional level. However, because the Schuyler Heim Bridge/SR-47 project is included in the conforming RTIP and is consistent with the RTP, regional air quality impacts associated with the project have been accounted for and, therefore, are considered to be less than significant. An analysis of VMT by project alternative and the resulting emission changes from roadways affected by the proposed action has been included in this report.

The second way in which project operations could affect air quality would be by creating localized pollutant "hot spots." Automobiles account for a large percentage of the CO emissions in urban and suburban areas; therefore, maximum CO concentrations tend to be localized near areas of heavy traffic congestion (Benson and Wood, 1988). Investigating the potential for localized impacts is important because changes in the distribution of traffic could create a hot spot regardless of the regional impacts of a project. Therefore, this study includes a dispersion modeling analysis for CO that predicts worst-case CO levels in the immediate project vicinity and compares the levels to the CO air quality standards. The CO analysis also is required as part of the project-level conformity analysis.

Hot spots of PM_{10} and $PM_{2.5}$ also could occur where large amounts of traffic operate under heavily congested conditions. EPA has designated part of Los Angeles County, which includes the project area, as nonattainment for both PM_{10} and $PM_{2.5}$. On March 10, 2006, EPA issued amendments to the Transportation Conformity Rule to address localized impacts of particulate matter (71 FR 12468). This amendment requires the assessment of localized air quality impacts in $PM_{2.5}$ and PM_{10} nonattainment and maintenance areas for projects of air quality concern. As required by the amended transportation conformity rule, a qualitative $PM_{2.5}$ hot spot

analysis is included as part of the project-level conformity analysis. Because the PM_{10} hot spot analysis for the proposed project was completed prior to the release of the new guidance, it was completed in accordance with the previous guidance (EPA, 2006). Therefore, PM_{10} hot spots were addressed following the *Technical Report: Particulate Matter and Transportation Project Analysis Protocol* (PM_{10} protocol) (UCD, Caltrans, FHWA, 2005).

An indirect impact from the operation of the replacement Schuyler Heim Bridge would be the effect associated with reconfiguration of the bridge. For alternatives where the existing lift-span of the Schuyler Heim Bridge would be replaced with a fixed span, detours and delays for marine vessels that would no longer pass under the bridge may result in increased emissions. However, the replacement of the lift-span would reduce emissions from automobiles and trucks that would not be waiting for the span to be lowered. Emission changes due to marine vessel detours during project operation are addressed in this report.

In addition to the criteria air pollutants for which there are NAAQS, EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries). MSATs are a subset of the 188 air toxics defined by the CAA. The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. As required by FHWA, the MSAT analysis was conducted and is included in this report.

The air quality impacts of the project alternatives were analyzed for 3 different study years, 2011, 2015, and 2030. The year 2011 represents the earliest foreseeable year that construction of the Schuyler Heim Bridge Replacement and SR-47 Expressway Project would be completed and operation would begin. The year 2015 represents the year when construction of the flyover is complete. The year 2030 represents the design year for the project and also the year for which the RTP was forecast and determined to conform.

4.2 Significance Criteria

4.2.1 Construction

Air quality impacts resulting from construction were deemed significant if daily emission estimates were above the significance thresholds for construction emissions provided in the SCAQMD CEQA Air Quality Handbook (SCAQMD, 2006). The construction emission thresholds are provided below.

- 75 pounds per day ROG
- 100 pounds per day NO_X
- 550 pounds per day CO
- 150 pounds per day PM_{10}
- 55 pounds per day $PM_{2.5}$
- 150 pounds per day SO_X

4.2.2 Operations

4.2.2.1 Criteria Pollutants

For operational air quality impacts resulting from vehicle emissions, a project would be considered significant if it would create a new CO, PM_{10}, and $PM_{2.5}$ violation (federal standards) or would exacerbate an existing violation, as indicated by hot spot analyses. The operation emissions from the proposed project are included in the RTP emission budgets which have been incorporated into the SCAQMD 2007 AQMP. Direct emissions from the proposed project were not evaluated against the SCAQMD thresholds because these emissions are already included in the SCAQMD emissions inventory.

However, indirect emissions from the proposed project would not be accounted for in the SCAQMD emission inventory. Indirect impacts resulting from marine vessel emissions would be considered significant if the resulting increase would be above the significance thresholds for operational emissions provided in the SCAQMD CEQA Air Quality Handbook (SCAQMD, 2006). The operational emission thresholds are provided below.

- 55 pounds per day ROG
- 55 pounds per day NO_X
- 550 pounds per day CO
- 150 pounds per day PM_{10}
- 55 pounds per day $PM_{2.5}$
- 150 pounds per day SO_X

4.3 Construction Impacts

4.3.1 Construction Methods

Construction of the build alternatives is expected to take approximately 2 to 3 years for the Schuyler Heim Bridge and expressway, and one year for the flyover. Project construction involves activities such as demolition; grading; excavation; construction of foundations, bridge abutments, and columns; and construction of the bridge and expressway. Two construction methodologies were considered for the proposed action: cast-in-place (CIP) and segmental. With the conventional CIP methodology, construction would occur within a temporary structure, or "falsework," that is built and then removed once construction is complete.

The segmental construction method is often used for bridges with span lengths greater than 91 m (300 feet). This method also is used on sites where there are constraints on falsework placement (such as over the Cerritos Channel). Segmental construction would involve construction of cantilevered segments from each end of the bridge. The cantilevered segments would be extended toward the other until they meet in the middle and are connected.

For reasons of cost, the CIP method is proposed for all expressway construction and for most or all bridge construction. However, segmental construction could be used for portions of the bridge over the Cerritos Channel. The remainder of the bridge would be constructed using the conventional CIP method.

Construction impacts from CIP and segmental construction methods were evaluated in this report.

4.3.2 Direct Construction Impacts

Short-term impacts to air quality would result from construction activities directly associated with the project alternatives. Equipment would be used during site preparation and project construction to perform activities such as clearing, grading, excavating, and demolishing existing structures. These activities would involve the use of diesel- and gasoline-powered equipment that would generate emissions of criteria pollutants such as CO, NO_X, ROG, SO_X, PM_{10}, and $PM_{2.5}$. Emissions of NO_X and ROG would contribute to the formation of ozone, and NO_X would also contribute to the formation of $PM_{2.5}$.

The construction emissions were analyzed for both CIP and segmental construction methods following the general procedures in the *CEQA Air Quality Handbook* (SCAQMD, 1993) and those updated *CEQA Air Quality Handbook* sections on SCAQMD's website (SCAQMD, 2007). Emissions associated with the construction of the alternatives were estimated using projected construction activities, phases, and estimated hours of equipment operations. Specific construction information consisted of:

- Projected construction schedule for each phase of the alternatives
- Number and type of construction equipment
- Equipment usage rates (hours per day)
- VMT/day
- Number of daily construction workers onsite during a typical peak construction day
- Demolition and excavation volumes
- Site grading and stockpile areas
- Amount of material handling

4.3.2.1 Equipment and Vehicle Exhaust

Construction equipment and vehicle emission factors of CO, NO_X, ROG, SO_X, and PM_{10} used in construction emission calculations were obtained from information available in the *CEQA Air Quality Handbook* (SCAQMD, 1993 and 2007), the EMFAC2007 emissions model, and the EPA *Compilation of Air Pollutant Emission Factors* (AP-42). Because there are currently few or no $PM_{2.5}$ emission factors for combustion processes, the $PM_{2.5}$ emissions were calculated following the methodology recommended by SCAQMD and using the $PM_{2.5}$ fraction of PM_{10} (SCAQMD, 2006). Summaries of the emissions factors and their sources are listed in Appendix I. The lists of construction equipment that would be used during construction activities for each alternative are provided in the following sections. No construction estimates were required for the No-Build and TSM alternatives.

4.3.2.2 Fugitive Dust Emissions

Particulate matter sources are associated primarily with soil disturbance and include, but are not limited to, the following activities:

- Demolition
- Excavation
- Grading

- Material handling
- Using paved and unpaved roads (entrained dusts)
- Stockpiling

Fugitive dust emissions from construction of each project alternative were calculated based on the demolition and excavation volumes, site grading areas, amount of soil to be handled, vehicle travel miles on unpaved roads, and the total area of stockpiles during each construction phase. Emission factors for PM_{10} from the *CEQA Air Quality Handbook*, EMFAC2007 emissions model, and the EPA *Compilation of Air Pollutant Emission Factors* (AP-42) were used in the calculation of fugitive dust emissions. Fugitive dust emissions from the construction sites were assumed to be reduced by 68 percent by watering the exposed areas three times a day. The fugitive dusts from unpaved roads were assumed to be reduced by 45 percent by watering the unpaved roads three times a day. The actual fugitive dust emissions are expected to be less than those presented in this report because of the inherently damp soils at the site for bridge construction due to high groundwater levels. Currently, no emission factors are available to calculate the fugitive $PM_{2.5}$ emissions. The $PM_{2.5}$ emissions were calculated following the methodology recommended by SCAQMD and using the $PM_{2.5}$ fraction of PM_{10} (SCAQMD, 2006).

Because equipment operation would vary by construction activity, a worst-case emission scenario was identified for each build alternative. The projected construction schedules were used to find the combination of overlapping construction activities that yielded the highest emissions.

4.3.3 Indirect Construction Impacts

Marine traffic in the Cerritos Channel would be affected during the time of bridge construction, as noted below.

- With the CIP method of construction, full closure of the channel would occur for a period of 25 days, intermittent closures for a total 40 days, and channel restrictions for a total of 240 days.
- With use of segmental construction for the main span of the new bridge, vertical clearance would be reduced to 12 m (39 feet) or less, resulting in channel restrictions for two periods of 90 days each (once during construction of the east side of the new bridge and once during construction of the west side). The channel would be closed completely for a period of 5 days when the mid-span truss of the old bridge would be removed.

As a result of the closures and restrictions to the marine vessel traffic, ships that cannot pass would need to take a longer route outside the channel. The increased trip time of these ships would result in increased emissions of criteria pollutants and would cause an indirect impact to the ambient air quality.

Worst-case daily emissions from the marine vessel detour were calculated for the days when the channel is closed completely. Annual emissions from the marine vessel detour during the construction period were calculated based on the bridge closure and traffic restriction schedule. Emissions of CO, NO_X, ROG, SO_X, and PM_{10} of marine vessels were calculated using the *Analysis of Commercial Marine Vessels Emissions and Fuel Consumption Data* (EPA, 2000) in conjunction with forecasted detour travel times (CH2M HILL, 2005a). $PM_{2.5}$ emissions were calculated following the methodology recommended by SCAQMD

and using the $PM_{2.5}$ fraction of PM_{10} (SCAQMD, 2006). The detoured ships primarily would be non-ocean-going ships, such as tugboats, fishing boats, yachts, and harbor operations vessels. It was assumed that ships would be slow cruising 50 percent of the time and maneuvering the rest of the time during the detour.

4.3.4 Alternative 1 and Alternative 1A Construction Impacts Summary

4.3.4.1 Construction Equipment and Schedule

This alternative would replace the existing Schuyler Heim Bridge to meet current seismic criteria and provide a flyover from eastbound Ocean Boulevard onto northbound SR-47. It also would construct a new SR-47 Expressway to provide a high-capacity alternative route along the Alameda Corridor for traffic between Terminal Island and Alameda Street, south of Pacific Coast Highway. The construction activities would involve demolition of the old bridge, new construction of the replacement bridge, construction of the SR-47 Expressway and the flyover. The equipment to be used for each construction phase of Alternative 1 is listed in Tables 4A, 4B, and 4C. The equipment for Alternative 1A was assumed to be the same as Alternative 1.

TABLE 4A
Alternative 1 Construction Equipment List – Schuyler Heim Bridge Construction

Activity	Duration	Equipment/ Emission Source (Cast-in-Place)	Equipment/ Emission Source (Segmental)
Bridge Construction			
Site Preparation Clearing, Grubbing & Earthwork	01/11/2009 - 02/11/2009	Backhoe/excavator, pickup, haul truck	Same [a]
Shaft and Columns -1 Drilled Shaft Construction	02/01/2009 - 02/01/2011	200-ton crane, caisson drill, 140-ton crane, generator, flatbed, pickup, concrete truck, concrete pump truck, compressor, water truck	200-ton crane, caisson drill, 200-ton gantry, generator, flatbed, pickup, concrete truck, concrete pump truck, compressor, water truck
Shaft and Columns -2 Footing Construction	01/01/2010 - 01/20/2011	Backhoe/excavator, 140-ton crane, generator, haul truck, pickup, concrete truck, concrete pump truck, compressor, water truck	Backhoe/excavator, 200-ton crane, generator, haul truck, pickup, concrete truck, concrete pump truck, compressor, water truck
Shaft and Columns -3 Column Construction	02/20/2009 - 03/01/2011	140-ton crane, generator, flatbed, pickup, concrete truck, concrete pump truck, compressor	Same [a]
Falsework	03/01/2009 - 07/30/2011	140-ton crane, generator, flatbed, pickup, rough terrain (forklift), scissor lift, compressor, boom, semi-truck, loader, tug boat,	None [b]
Superstructure -1 Approach Span Erection	07/01/2009 - 07/30/2010	275 ton crane, rough terrain (forklift), 140-ton crane, generator, semi truck, flatbed, pickup, concrete truck, concrete pump truck, compressor	275-ton crane, rough terrain (forklift), 200-ton gantry, generator, semi truck, flatbed, pickup, concrete truck, concrete pump truck, compressor

TABLE 4A
Alternative 1 Construction Equipment List – Schuyler Heim Bridge Construction

Activity	Duration	Equipment/ Emission Source (Cast-in-Place)	Equipment/ Emission Source (Segmental)
Superstructure -2 Main Span Erection	07/01/2009 - 07/30/2011	275-ton crane, rough terrain (forklift), 140-ton crane, generator, semi truck, flatbed, pickup, concrete truck, concrete pump truck, compressor	400-ton crane, rough terrain (forklift), 200-ton gantry, generator, semi truck, flatbed, pickup, concrete truck, concrete pump truck, compressor, loader
Bridge Demolition (including both approaches)	11/01/2009 - 03/30/2011	Pickup, haul truck, compressor, generator, flatbed, backhoe/ excavator, loader	Same [a]
Barriers and Joints	02/01/2009 - 07/30/2011	Pickup, concrete trucks, flatbed truck, semi truck	Same [a]
Stripping, Lighting, and Signing	09/01/2009 - 08/30/2011	Pickup, paint truck, compressor, bucket truck, semi truck, boom truck	Same [a]

Notes:
[a.] The type of equipment used for each construction phase is the same when using the cast-in place method and the segmental method. However, the number of each type of equipment used is different for the two construction methods.
[b.] The falsework phase is not needed when using the segmental construction method.

TABLE 4B
Alternative 1 Construction Equipment List – SR-47 Construction

SR-47 Construction	Duration	Equipment/ Emission Source (Cast-in-Place)
Site Preparation – Earthwork	02/01/2009 - 09/01/2009	Backhoe, loader, haulers (truck), generator, flatbed, pickup, grader, vibratory loader, asphalt paver, compressor, water truck
Drilled Shaft Construction	03/01/2009 - 02/01/2011	200-ton crane, caisson drill, 140-ton crane, generator, flatbed, pickup, concrete truck, concrete pump truck, compressor, water truck
Foundation Construction	10/01/2009 - 11/01/2009	Backhoe/excavator, 140-ton crane, generator, haul truck, pickup, concrete truck, concrete pump truck, compressor, water truck, pile driver
Column Construction	02/20/2009 - 4/01/2011	140-ton crane, generator, flatbed, pickup, concrete truck, concrete pump truck, compressor
Falsework	03/01/2009 - 07/30/2011	100-ton crane, generator, flatbed, pickup, rough terrain (forklift), scissor lift, compressor, boom
Superstructure – Span Erection	07/01/2009 - 07/30/2011	275-ton crane, rough terrain (fork-lift), 140-ton crane, generator, semi truck, flatbed, pickup, concrete truck, concrete pump truck, compressor
Drainage	03/01/2009 - 03/01/2011	Backhoe, loader, haulers (truck), generator, flatbed, pickup, vibratory roller, compressor, water truck, concrete truck
Retaining Walls and Soundwalls	07/01/2009 - 12/30/2010	Backhoe, loader, haulers (truck), generator, flatbed, pickup, vibratory roller, compressor, water truck, concrete truck
Striping, Lighting and Signing	09/01/2009 - 08/30/2011	Boom, loader, generator, flatbed, pickup, compressor, striper (truck)

TABLE 4C
Alternative 1 Construction Equipment List – Flyover Construction

Flyover Construction	Duration	Equipment/ Emission Source (Cast-in-Place)
Site Preparation – Earthwork	01/01/2014 - 01/10/2014	Backhoe/excavator, pickup, haul truck, water truck
Drilled Shaft Construction	01/11/2014 - 03/11/2014	Caisson drill, 140-ton crane, generator, flatbed, pickup, concrete truck, concrete pump truck, compressor, water truck
Column Construction	3/12/2014 - 05/12/2014	140-ton crane, generator, flatbed, pickup, concrete truck, concrete pump truck, compressor
Falsework	03/12/2014 - 05/15/2014	100-ton crane, generator, flatbed, pickup, rough terrain (forklift), scissor lift, compressor, boom
Superstructure – Span Erection	05/15/2014 - 10/15/2014	275-ton crane, rough terrain (fork-lift), 140-ton crane, generator, semi truck, flatbed, pickup, concrete truck, concrete pump truck, compressor
Drainage	01/15/2014 - 03/01/2014	Backhoe, haulers (truck), generator, flatbed, pickup, vibratory roller, compressor, water truck, concrete truck
Retaining Walls and Soundwalls	03/01/2014 - 08/01/2014	Backhoe, loader, haulers (truck), generator, flatbed, pickup, vibratory roller, compressor, water truck, concrete truck
Striping, Lighting and Signing	10/21/2014 - 11/21/2014	Loader, generator, flatbed, pickup, compressor, striper (truck)

4.3.4.2 Direct Construction Emissions

To estimate the worst-case daily emissions, emissions from construction phases that would be conducted partially or entirely within the same time period were combined. Detailed breakdowns of the emissions for the construction activities of Alternative 1 using the CIP and segmental construction methods are provided in Appendixes A and E, respectively.

Summaries of maximum combined daily emissions and the maximum daily emissions from construction equipment exhaust, workers' commutes, and fugitive dusts from each of the construction methods are provided in Table 5. The maximum daily emissions from individual sources of equipment exhaust, fugitive dust, and workers' commutes are not additive because these worst-case emissions do not always occur on the same day. The maximum combined emissions represent the worst-case emissions of all sources during the entire construction of Alternatives 1 or 1A (see Appendixes A, A1, and E for details on how the combined maximum numbers are quantified).

TABLE 5
Alternative 1/Alternative 1A Maximum Direct Construction Emissions with Mitigation to Control Fugitive Dust

	Cast-in-Place Method Emissions						Segmental Method Emissions					
	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Maximum Construction Equipment Exhaust	831	1761	206	1.8	85	77	764	1546	194	1.7	78	71

TABLE 5
Alternative 1/Alternative 1A Maximum Direct Construction Emissions with Mitigation to Control Fugitive Dust

	Cast-in-Place Method Emissions						Segmental Method Emissions					
	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Maximum Workers Commute	73	7.6	7.5	0.08	0.65	0.41	67	7.0	6.9	0.07	0.60	0.35
Maximum Fugitive Dust	NA	NA	NA	NA	903	191	NA	NA	NA	NA	716	152
Combined Maximum Daily Emissions	**905**	**1769**	**214**	**1.9**	**988**	**269**	**831**	**1553**	**201**	**1.7**	**795**	**223**

Note:
1. According to SCAQMD *CEQA Air Quality Handbook* Table 11-4, the control efficiencies of the fugitive dust from construction sites and unpaved roads were assumed to be 68 percent and 45 percent, respectively, by watering the sites or unpaved roads three times a day. The PM_{10} emissions listed in the table have taken into account the above control efficiencies.

4.3.4.3 Indirect Emissions from Marine Vessel Detour

Maximum hours per day marine vessels would spend in detour during the Schuyler Heim Bridge construction were estimated using the data provided in *Draft Schuyler Heim Bridge Replacement and SR-47 Expressway Project: Long Term Economic Impacts to Marine Vessel Operation in the Cerritos Channel* (CH2M HILL, 2005a). The daily hours for detour were estimated based on the full closure of the channel, and thus are the same for both construction methods, CIP and segmental. The majority of the marine vessel emissions would be from tugboats (see Table 6).

The daily emissions of marine vessels in detour were combined with the direct construction emissions and compared with the SCAQMD significance thresholds for construction. Detailed emission calculations of the marine vessel detours are in Appendix J.

TABLE 6
Maximum Daily Marine Vessel Detour Emissions During Schuyler Heim Bridge Construction

Ship Type	Worst-case Daily Detour Hours During Construction (hours/day)	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Tugs	4.95	29.1	117.0	4.4	0.079	3.1	2.81
Harbor Operations	0.11	0.75	3.0	0.11	0.0020	0.079	0.072
Fishing	0.02	0.037	0.15	0.0055	0.00010	0.0038	0.0035
Yachts	1.07	2.7	11.0	0.42	0.0074	0.29	0.26
Tankers	0.02	0.43	1.6	0.067	0.0011	0.042	0.039
Total	NA	33.1	132.8	5.0	0.09	**3.5**	3.2

4.3.4.4 Total Construction Impacts

The total direct and indirect construction emissions are subject to SCAQMD CEQA requirements. The summary of the emissions and the comparison to the SCAQMD thresholds are shown in Table 7.

TABLE 7
Alternative 1/Alternative 1A Total Construction-Related Emissions

	Cast-in-Place Method Emissions						Segmental Method Emissions					
	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Direct Construction Emissions	**905**	**1769**	**214**	**1.9**	**988**	**269**	**831**	**1553**	**201**	**1.7**	**795**	**223**
Indirect Marine Vessel Emissions	33.1	132.8	5.0	0.09	**3.5**	3.2	33.1	132.8	5.0	0.09	**3.5**	3.2
Total Emissions	938	1902	219	2.0	992	272	864	1686	206	2.0	799	226
SCAQMD Thresholds	**550**	**100**	**75**	**150**	**150**	**55**	**550**	**100**	**75**	**150**	**150**	**55**

As shown in Table 7, total direct and indirect emissions of CO, NO_X, ROG, PM_{10} and $PM_{2.5}$ are predicted to exceed daily significance thresholds during construction of Alternative 1. Therefore, CO, NO_X, ROG, PM_{10} and $PM_{2.5}$ emissions during project construction would result in a temporary significant impact to air quality. Impacts to sensitive receptors near construction areas would be inversely proportional to distance from the project site and would decrease the farther away the receptor is from the site. Construction lay-down areas would be located as far from sensitive receptors as the project would allow.

Construction equipment exhaust and construction-related vehicle exhaust would be the major contributors to the CO, NO_X, and ROG emissions. Fugitive dust emissions associated with vehicle travel on unpaved roads at the project site would be the major contributor to the PM_{10} and $PM_{2.5}$ emissions.

Mitigation measures are presented in Section 5 to reduce construction-related emissions. After mitigation, construction emissions would be expected to remain a temporary significant impact.

4.3.5 Alternative 2 Construction Impacts Summary

4.3.5.1 Construction Equipment and Schedule

Alternative 2 would extend SR-103 to the northwest to join Alameda Street between Sepulveda Boulevard and I-405 in addition to the flyover and replacement of the Schuyler Heim Bridge. The construction activities would involve demolition of the old bridge and new construction of the replacement bridge, the flyover, and the SR-103 Extension. The equipment to be used for each construction phase of replacing the existing bridge are the same as those listed in Table 4A. Construction of the SR-103 Extension and flyover would have the same phasing and equipment as those listed in Tables 4B and 4C, respectively.

4.3.5.2 Direct Construction Emissions

The emission calculations for construction of Alternative 2 used the same methodologies as for Alternative 1. The emissions from construction phases that would be conducted partially or entirely within the same time period were combined to obtain the worst-case daily emissions. A detailed breakdown of the emissions for the construction activities of Alternative 2 is provided in Appendixes B and F for the CIP and segmental construction methods, respectively. Details of the flyover construction emissions are the same as in Appendix A1.

Summaries of maximum combined daily emissions and the maximum daily emissions from construction equipment exhaust, workers' commutes, and fugitive dust from the two construction methods are provided in Table 8. The maximum combined emissions represent the worst-case emissions of all sources during the entire construction of Alternative 2 (see Appendixes B and F for details on how the combined maximum numbers are quantified).

TABLE 8
Alternative 2 Maximum Direct Construction Emissions – with Mitigation to Control Fugitive Dust

	Cast-in-Place Method Emissions						Segmental Method Emissions					
	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Maximum Construction Equipment Exhaust	822	1736	204	2	83	76	777	1619	193	2	76	69
Maximum Workers Commute	75	7.8	7.7	0.08	0.67	0.42	68	7.1	7.0	0.08	0.61	0.38
Maximum Fugitive Dust	NA	NA	NA	NA	904	191	NA	NA	NA	NA	717	152
Combined Maximum Daily Emissions	**897**	**1744**	**211**	**1.9**	**988**	**268**	**846**	**1626**	**200**	**1.9**	**794**	**222**

Note:
1. According to SCAQMD *CEQA Air Quality Handbook* Table 11-4, the control efficiencies of the fugitive dust from construction sites and unpaved roads were assumed to be 68 percent and 45 percent, respectively, by watering the sites or unpaved roads three times a day. The PM_{10} emissions listed in the table have taken into account these control efficiencies.

4.3.5.3 Indirect Emissions from Marine Vessel Detour

Impacts from marine vessel detour emissions would be the same as those of Alternative 1 (Table 6) because the bridge construction and marine vessel traffic restrictions would be the same for all alternatives that have bridge constructions.

4.3.5.4 Total Construction Impacts

The total direct and indirect construction emissions associated with Alternative 2 and the comparison to the SCAQMD construction emission thresholds are shown in Table 9.

TABLE 9
Alternative 2 Total Construction-Related Emissions

	Cast-in-Place Method Emissions						Segmental Method Emissions					
	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Direct Construction Emissions	**897**	**1744**	**211**	**1.9**	**988**	**268**	**846**	**1626**	**200**	**1.9**	**794**	**222**
Indirect Marine Vessel Emissions	33.1	132.8	5.0	0.09	3.5	3.2	33.1	132.8	5.0	0.09	3.5	3.2
Total Emissions	930	1877	216	2.0	992	271	879	1759	205	2.0	798	225
SCAQMD Thresholds	**550**	**100**	**75**	**150**	**150**	**55**	**550**	**100**	**75**	**150**	**150**	**55**

As shown in Table 9, CO, NO_X, ROG, PM_{10}, and $PM_{2.5}$ emissions are predicted to exceed daily significance thresholds during construction of Alternative 2. Therefore, CO, NO_X, ROG, PM_{10}, and $PM_{2.5}$ emissions during Alternative 2 construction would result in a temporary significant impact to air quality. Impacts to sensitive receptors near the construction areas would be inversely proportional to distance from the project site and would decrease the farther away the receptor is from the site. Construction lay-down areas would be located as far from sensitive receptors as the project would allow.

Construction equipment exhaust and construction-related vehicle exhaust would be the major contributors to the CO, NO_X, and ROG emissions. Fugitive dust emissions associated with vehicle travel on unpaved roads at the project site are the major contributor to the PM_{10} and $PM_{2.5}$ emissions.

Mitigation measures are presented in Section 5 to further reduce construction-related emissions. After mitigation, construction emissions are expected to remain a temporary significant impact.

4.3.6 Alternative 3 Construction Impacts Summary

4.3.6.1 Construction Equipment and Schedule

Alternative 3 would preserve the existing Schuyler Heim Bridge and construct a new fixed-span bridge on an alignment east of the existing bridge. The SR-47 Expressway and the flyover will be constructed under this alternative. The existing bridge would not be demolished under this alternative. The construction activities would involve new construction of the replacement bridge, the flyover, and the SR-47 Expressway. The equipment to be used for each construction phase of the bridge, the SR-47 Expressway, and the flyover would be the same as those listed in Tables 4A, 4B, and 4C for Alternative 1.

4.3.6.2 Construction Emissions

The emission calculations for Alternative 3 used the same methodologies as for Alternative 1. The emissions from construction phases that would be conducted partially or entirely within the same time period were combined to obtain the worst-case daily

emissions. A detailed breakdown of the emissions for the construction activities of Alternative 3 is provided in Appendix C and Appendix G for the CIP and segmental methods, respectively. Details of the flyover construction emissions are the same as in Appendix A1.

Summaries of maximum combined daily emissions and the maximum daily emissions from construction equipment exhaust, workers' commutes, and fugitive dust from the two methods of construction are provided in Table 10. The maximum combined emissions represent the worst-case emissions of all sources during the entire construction of Alternative 3 (see Appendix C and G for details on how the combined maximum numbers are quantified).

TABLE 10
Alternative 3 Maximum Direct Construction Emissions – with Mitigation to Control Fugitive Dust

	Cast-in-Place Method Emissions						Segmental Method Emissions					
	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Maximum Construction Equipment Exhaust	814	1745	203	1.8	83	76	755	1528	192	1.6	77	70
Maximum Workers Commute	75	7.8	7.7	0.08	0.67	0.42	69	7.2	7.1	0.08	0.62	0.39
Maximum Fugitive Dust	NA	NA	NA	NA	893	189	NA	NA	NA	NA	706	150
Combined Maximum Daily Emissions	**889**	**1753**	**211**	**1.9**	**976**	**265**	**824**	**1535**	**199**	**1.7**	**784**	**220**

Note:

1. According to SCAQMD *CEQA Air Quality Handbook* Table 11-4, the control efficiencies of the fugitive dust from construction sites and unpaved roads were assumed to be 68 percent and 45 percent, respectively, by watering the sites or unpaved roads three times a day. The PM_{10} emissions listed in the table have taken into account these control efficiencies.

4.3.6.3 Indirect Emissions from Marine Vessel Detour

Impacts from emissions from marine vessel detours for Alternative 3 would be the same as those of Alternative 1 (Table 6) because the bridge construction and marine vessel traffic restrictions would be the same for all alternatives with bridge constructions.

4.3.6.4 Total Construction Impacts

The total direct and indirect construction emissions associated with Alternative 3, as well as the comparison to the SCAQMD construction emission thresholds are shown in Table 11.

TABLE 11
Alternative 3 Total Construction-Related Emissions

	Cast-in-Place Method Emissions						Segmental Method Emissions					
	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Direct Construction Emissions	**889**	**1753**	**211**	**1.9**	**976**	**265**	**824**	**1535**	**199**	**1.7**	**784**	**220**
Indirect Marine Vessel Emissions	33.1	132.8	5.0	0.09	3.5	3.2	33.1	132.8	5.0	0.09	3.5	3.2
Total Emissions	922	1886	216	2.0	980	268	857	1668	204	1.8	788	223
SCAQMD Thresholds	**550**	**100**	**75**	**150**	**150**	**55**	**550**	**100**	**75**	**150**	**150**	**55**

As shown in Table 11, CO, NO_X, ROG, PM_{10}, and $PM_{2.5}$ emissions are predicted to exceed daily significance thresholds during construction of Alternative 3. Therefore, CO, NO_X, ROG, PM_{10}, and $PM_{2.5}$ emissions during Alternative 3 construction would result in a temporary significant impact to air quality. Impacts to sensitive receptors near the construction areas would be inversely proportional to distance from the project site and would decrease the farther away the receptor is from the site. Construction lay-down areas would be located as far from sensitive receptors as the project would allow.

Construction equipment exhaust and construction-related vehicle exhaust are the major contributors to the CO, NO_X, and ROG emissions. Fugitive dust emissions associated with vehicle travel on unpaved roads at the project site would be the major contributors to the PM_{10} and $PM_{2.5}$ emissions.

Mitigation measures are presented in Section 5 to further reduce construction-related emissions. After mitigation, construction emissions are expected to remain a temporary significant impact.

4.3.7 Alternative 4 Construction Impacts Summary

4.3.7.1 Construction Equipment and Schedule

Alternative 4 proposes to replace the existing Schuyler Heim Bridge with a fixed bridge. The construction activities would involve demolition of the existing bridge and construction of the replacement bridge. The construction equipment to be used for each construction phase would be the same as those listed in Table 4A for bridge construction.

4.3.7.2 Construction Emissions

The emission calculations for Alternative 4 used the same methodologies as Alternative 1. The emissions from construction phases that would be conducted partially or entirely within the same time period were combined to obtain the worst-case daily emissions. A detailed breakdown of the emissions for the construction activities of Alternative 4 are provided in Appendix D and Appendix H for the CIP and segmental methods, respectively.

Summaries of maximum combined daily emissions and the maximum daily emissions from construction equipment exhaust, workers' commutes, and fugitive dusts for Alternative 4 are provided in Table 12. The maximum combined emissions represent the worst-case emissions of all sources during the entire construction of Alternative 4 (see Appendixes D and H for details on how the combined maximum numbers are quantified).

TABLE 12
Alternative 4 Maximum Direct Construction Emissions – with Mitigation to Control Fugitive Dust

	Cast-in-Place Method Emissions						Segmental Method Emissions					
	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Maximum Construction Equipment Exhaust	503	1091	121	1	50	236	445	901	111	1.0	45	41
Maximum Workers Commute	41	4.3	4.2	0.05	0.37	0.23	35	3.7	3.6	0.04	0.3	0.2
Maximum Fugitive Dust	NA	NA	NA	NA	635	134	NA	NA	NA	NA	448	95
Combined Maximum Daily Emissions	**544**	**1095**	**125**	**1.1**	**685**	**180**	**480**	**905**	**115**	**1.0**	**493**	**136**

Note:
1. According to SCAQMD *CEQA Air Quality Handbook* Table 11-4, the control efficiencies of the fugitive dust from construction sites and unpaved roads were assumed to be 68 percent and 45 percent, respectively, by watering the sites or unpaved roads three times a day. The PM_{10} emissions listed in the table have taken into account these control efficiencies.

4.3.7.3 Indirect Emissions from Marine Vessel Detour

Impacts from emissions of detouring marine vessels for Alternative 4 would be the same as those of Alternative 1 (Table 6) because the bridge construction and marine vessel traffic restrictions would be the same for all alternatives with bridge construction.

4.3.7.4 Total Construction Impacts

The total direct and indirect construction emissions associated with Alternative 4, as well as the comparison to the SCAQMD construction emission thresholds, are shown in Table 13.

As shown in Table 13, SO_X emissions would be below the SCAQMD threshold. The NO_X, ROG, PM_{10}, and $PM_{2.5}$ emissions are predicted to exceed daily significance thresholds during construction of Alternative 4 for both construction methods. CO emissions are expected to exceed the daily significance thresholds when using the cast-in-place method. Therefore, CO, NO_X, ROG, PM_{10}, and $PM_{2.5}$ emissions during construction of Alternative 4 would result in a temporary significant impact to air quality. Impacts to sensitive receptors near the construction areas would be inversely proportional to distance from the project site and would decrease the farther away the receptor is from the site. Construction lay-down areas would be located as far from sensitive receptors as the project would allow.

TABLE 13
Alternative 4 Total Construction-Related Emissions

	Cast-in-Place Method Emissions						Segmental Method Emissions					
	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Direct Construction Emissions	**544**	**1095**	**125**	**1.1**	**685**	**180**	**480**	**905**	**115**	**1.0**	**493**	**136**
Indirect Marine Vessel Emissions	33.1	132.8	5.0	0.09	3.5	3.2	33.1	132.8	5.0	0.09	3.5	3.2
Total Emissions	577	1228	130	1.2	689	183	513	1038	120	1.1	497	139
SCAQMD Thresholds	**550**	**100**	**75**	**150**	**150**	**55**	**550**	**100**	**75**	**150**	**150**	**55**

Construction equipment exhaust and construction-related vehicle exhaust would be the major contributors to CO, NO_X and ROG emissions. Fugitive dust emissions associated with vehicle travels on unpaved roads at the project site would be the major contributor to the PM_{10} and $PM_{2.5}$ emissions.

Mitigation measures are presented in Section 5 to further reduce construction-related emissions. After mitigation, construction emissions would be expected to remain a temporary significant impact.

4.3.8 No-Build Alternative and TSM Alternative

There are no construction activities associated with the No-Build alternative and the TSM alternative. Therefore, these two alternatives would not be expected to have adverse impacts to air quality.

4.3.9 Naturally Occurring Asbestos

Another pollutant of potential concern in assessing localized air quality impacts associated with construction activities is naturally occurring asbestos. Asbestos is a toxic air contaminant that is regulated under the Asbestos Airborne Toxic Control Measure (ATCM), which was adopted by the CARB in 1990 and amended in 2000. The ATCM states that allowable asbestos content in surfacing materials must be less than 0.25 percent, effective spring 2001. In addition to surfacing materials, asbestos may occur naturally in serpentinite and ultramafic rock and can be released when the rock is broken or crushed.

According to the Department of Conservation, Division of Mines and Geology, the project is in a county that does contain serpentinite or ultramafic rock. However, any serpentinite or ultramafic rock found in Los Angeles County is restricted to the Catalina Islands. The surficial geology of the Long Beach area is composed of quaternary alluvial material that consists of sands, gravels, silts, and clays and not ultramafic or serpentinite material (Cal. DWP, 1961). Therefore, fugitive asbestos from naturally occurring materials would not be emitted in significant quantities during construction or operation of the proposed project

and alternatives. Surfacing materials also would not contain more than 0.25 percent asbestos; therefore, the proposed project and alternatives would not cause a significant impact on air quality from emissions of asbestos.

4.3.10 Asbestos and Lead-Based Paint from Bridge Demolition

According to the Initial Site Assessment of the project (CH2M HILL, 2005b), the Schuyler Heim Bridge was evaluated for the presence of asbestos-containing materials (ACM) and lead-based paint (LBP). Based on the type and condition of the Schuyler Heim Bridge, ACM and LBP likely are present and considered recognized environmental conditions (RECs). It has been recommended that a predemolition survey of the Schuyler Heim Bridge be conducted for ACM and LBP. The purpose of the survey will be to determine the presence of regulated and/or potentially hazardous construction materials on the bridge.

Sample collection procedures will be based upon the Asbestos Hazard Emergency Response Act (AHERA) protocols and EPA guidelines. Surveys will be conducted following modified AHERA, Occupational Safety and Health Administration (OSHA) Asbestos Construction Standard, 29 CFR 926.1101, and applicable regulations under the federal National Emission Standard for Hazardous Air Pollutants (NESHAP). State and local regulations will be incorporated where applicable. Samples will be collected by an EPA/AHERA-certified building inspector.

4.4 Operational Impacts

4.4.1 Introduction

Air quality impacts directly associated with operation of the project alternatives would be less than significant. The Schuyler Heim Bridge/SR-47 project is included in the Adopted 2008 RTIP, and is consistent with the conforming 2008 RTP. Therefore, regional air quality impacts would be less than significant.

The replacement of the existing lift span of the Schuyler Heim Bridge with a fixed span would have an indirect impact on local air quality by affecting marine traffic. Replacing the lift-span bridge with a fixed-span bridge would force taller marine vessels to take a longer route around Terminal Island and would delay vessels with adjustable mast heights. Impacts from the emissions of marine vessels detouring during project operations were evaluated based on the SCAQMD operational emission thresholds in this section.

The pollutants of primary concern when assessing localized impacts of transportation projects are CO, PM_{10}, and $PM_{2.5}$. Elevated concentrations of these pollutants tend to accumulate near areas of heavy traffic congestion where average vehicle speeds are low. Tailpipe emissions are of primary concern when assessing localized impacts of CO, PM_{10}, and $PM_{2.5}$ along paved roads, especially where unusually large numbers of idling diesel-powered vehicles may be concentrated, such as truck and bus terminals or railroad yards.

Increased average vehicle speeds could cause surface dust to become airborne; however, it is extremely unlikely that local increases in $PM_{2.5}$ and PM_{10} concentrations would be associated with projects that improve the level of service on freeways (UCD, 1994).

The impact of a project would be considered significant if the project operational emissions exceeded SCAQMD CEQA thresholds, created a new CO, PM_{10}, or $PM_{2.5}$ violation, or exacerbated an existing violation. Because the proposed project is located in a federal nonattainment area for PM_{10} and $PM_{2.5}$ standards, and was recently re-designated as attainment/maintenance area for the CO standards, the project is subject to project-level federal conformity requirements. On March 10, 2006, EPA issued amendments to the Transportation Conformity Rule to address localized impacts of particulate matter (PM_{10} and $PM_{2.5}$). This amendment requires the assessment of localized air quality impacts for federally-funded or approved transportation projects in PM_{10} and $PM_{2.5}$ nonattainment and maintenance areas.

Hot spot analyses were performed for the proposed build alternatives to assess impacts of CO, PM_{10}, and $PM_{2.5}$ near the project site during operation. These analyses are based on the Caltrans guidance document, *Transportation Project-Level Carbon Monoxide Protocol Revised* (*CO Protocol*)(UCD, 1997), the *Technical Report: Particulate Matter and Transportation Project Analysis Protocol* (PM_{10} protocol) (UCD, Caltrans, FHWA, 2005), and the FHWA/EPA guidance document, *Transportation Conformity Guidance for Qualitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* (EPA, 2006). The results of these analyses were used to assess localized project impacts and to determine project-level conformity.

In addition to the air quality impacts by criteria pollutants, the MSATs emissions were evaluated for the operation of the proposed project. The MSAT analysis was performed as required by the FHWA "*Interim Guidance on Air Toxic Analysis for National Environmental Policy Act (NEPA) Documents*" (Interim Guidance) (FHWA, 2006) and utilized the methodology and the software tool developed by University of California Davis (UCD, 2006).

4.4.2 Direct Operational Emissions – Vehicle Operational Emissions

The Schuyler Heim Bridge/SR-47 project is identified in the Adopted 2008 RTIP and the 2008 RTP. Therefore, the project is consistent with the regional plan and meets the regional transportation conformity requirements. The regional air quality impacts would be less than significant. The vehicle operational emissions were included in this section for illustration purposes only.

The project study area includes the areas between I-710, I-110, I-405, and Ocean Boulevard. Emissions from vehicles traveling in the project study area were calculated for the years 2003, 2011, 2015, and 2030 from VMT provided by Meyer, Mohaddes Associates (see Appendix K).

Emission factors for CO, NO_X, ROG, SO_X, PM_{10}, and $PM_{2.5}$ were obtained from EMFAC2007 (CARB, 2007). The emission factors selected from the EMFAC2007 results were based on average speeds and vehicle type (regional vehicle and heavy-duty trucks). Detailed emission calculations of the vehicle emissions are summarized in Appendix K.

Air pollutant emissions were estimated for Alternative 1, Alternative 2, and Alternative 6 (No Build). Alternative 3 is the bridge avoidance option, which would have the same traffic conditions as Alternative 1. Alternative 4 is the bridge replacement that would not affect the traffic conditions compared to the No-Build alternative. Therefore, it was assumed that

Alternatives 3 and 4 would have the same emissions as Alternatives 1 and 6, respectively. Alternative 5 was not evaluated in this report because no traffic analysis was performed for this alternative.

As shown in Table 14, criteria pollutant emissions from Alternative 1 and 3 are lower than emissions from the No-Build alternative due to a predicted decrease in VMT in the study area for 2011, 2015, and 2030. Emissions for Alternative 4 are predicted to be the same as those for the No-Build alternative because VMT in the project area is predicted to be the same. CO emissions from Alternative 2 in 2011 and 2015 are slightly higher than the No-Build alternative because Alternative 2 has a higher passenger car VMT. Increased VMT for Alternative 2 is attributable to increased capacity from the extension of SR-103. All future year scenarios have emissions less than the baseline 2003 conditions. This decrease in emissions over time can be attributed to EPA and CARB regulations that would require cleaner fuels and cleaner engines in future years.

TABLE 14
Peak Daily Vehicle Emissions for the Project Study Area

Year	Alternative	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
2003	**Existing Condition**	54,560	26,620	2,893	207	1,131	901
2011	**No Build**	24,544	18,138	1,417	52	876	669
	Alternative 1	24,399	17,989	1,402	52	871	665
	Alternative 2	24,635	16,934	1,364	51	836	632
	Alternative 3	24,399	17,989	1,402	52	871	665
	Alternative 4	24,544	18,138	1,417	52	876	669
2015	**No Build**	19,161	13,114	1,096	57	784	577
	Alternative 1	18,988	12,967	1,079	57	779	574
	Alternative 2	19,188	13,165	1,093	57	789	582
	Alternative 3	18,988	12,967	1,079	57	779	574
	Alternative 4	19,161	13,114	1,096	57	784	577
2030	**No Build**	11,153	5,902	704	72	629	455
	Alternative 1	10,870	5,704	664	72	625	441
	Alternative 2	10,960	5,770	671	72	631	445
	Alternative 3	10,870	5,704	664	72	625	441
	Alternative 4	11,153	5,902	704	72	629	455

4.4.3 Indirect Operational Emissions – Marine Vessel Detour Emissions

The replacement of the existing lift-span of the Schuyler Heim Bridge with a fixed-span bridge would have indirect impacts on local air quality by affecting the marine traffic.

Replacing the lift-span bridge with a fixed span bridge would force taller marine vessels to take a longer route around the Cerritos Channel and would delay vessels with adjustable mast heights. The increased trip times for the marine vessels would result in increased emissions of criteria pollutants.

Emissions of CO, NO_X, ROG, SO_X, and PM_{10} resulting from marine vessel detours and delays in 2011 and the years after were calculated using the *Analysis of Commercial Marine Vessels Emissions and Fuel Consumption Data* (EPA, 2000) in conjunction with forecasted delay and detour travel times (CH2M HILL, 2005a). $PM_{2.5}$ emissions were calculated following the methodology recommended by SCAQMD and using the $PM_{2.5}$ fraction of PM_{10} (SCAQMD, 2006). The detour hours during operation of the Schuyler Heim Bridge after 2011 are the same, based on the assumption that the marine traffic would not increase in future years (CH2M HILL, 2005a). The baseline, or 2003 conditions, is zero emissions because the detour is not currently in use. Based on the assumption that marine traffic would not increase in future years (CH2M HILL, 2005a), all emissions after 2011 are assumed to be equal to the emissions estimated for 2011. Therefore, only one set of emissions is presented, and values for 2003 and 2030 are not necessary.

The increased emissions from the marine vessels would be partially offset by a reduction in automobile and truck idling emissions from vehicles waiting for the bridge span to be lowered. However, emissions from the idling vehicles were predicted to be relatively small compared to the marine vessel emissions and, thus, were not included in the analysis. This approach resulted in a conservative estimate of the net emissions increase by accounting for only the marine vessel emissions; actual impacts would be less during project operation.

4.4.3.1 Comparisons with SCAQMD Thresholds

Daily emissions resulting from marine vessel detours during operation of the proposed fixed-span Schuyler Heim Bridge, as well as the comparisons with SCAQMD operational emission thresholds, are displayed in Table 15. Detailed emissions calculations are shown in Appendix J.

TABLE 15
Indirect Daily Operational Emissions from Marine Vessels

Ship Type	Worst-Case Daily Detour Hours During Operation (hours/day)	CO (lb/day)	NO_X (lb/day)	ROG (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Tugs	3.53	20.77	83.52	3.16	0.06	2.18	2.00
Harbor Operations	0.08	0.54	2.15	0.08	0.0015	0.06	0.05
Fishing	0.02	0.03	0.10	0.004	0.0001	0.003	0.003
Yachts	0.76	1.95	7.85	0.30	0.0053	0.20	0.19
Tankers	0.02	0.31	1.14	0.05	0.0008	0.03	0.03
Total		**23.6**	**94.8**	**3.59**	**0.06**	**2.47**	**2.27**
SCAQMD Thresholds		**550**	**55**	**55**	**150**	**150**	55

Table 15 shows that the 47-foot-span height of the bridge would result in a net change in emissions greater than the SCAQMD thresholds for NO_X. However, this emissions increase would be offset by the emissions reductions achieved by the truck buyback program

implemented during project construction. The amount of NO_X emissions offset would be up to 133 lb/day (24.2 ton/year) at the beginning of project operation; these emissions may gradually decrease over future years as the entire truck fleet becomes newer and cleaner.

4.4.4 Localized CO Impacts

Localized CO impacts resulting from the project alternatives were evaluated following the Caltrans guidance document, *Transportation Project-Level Carbon Monoxide Protocol (CO Protocol)*, (UCD, 1997). Supporting documentation, including the evaluation of project level conformity requirements applicable to the proposed project and the determination of project-level CO impacts, are presented in Appendix L-1. Localized CO impacts were assessed by estimating the maximum ambient CO concentrations near the intersections assumed to have the greatest potential impact as a result of the project for the build-out and planning horizon years of 2011 and 2030, respectively. The predicted concentrations were compared to the NAAQS and CAAQS for CO.

The 24 intersections in Table 16 were screened using level of service (LOS) and traffic data estimates to identify the intersections most likely to create a CO or PM_{10} hot spot (Meyer, Mohaddes Associates, 2007).

In general, the project would improve traffic flow and would increase average vehicle speeds through the SR-47 Alameda Corridor relative to the no-project condition by removing at-grade crossings and providing a more direct access to the Port of Long Beach. For example, the project either would improve or have little or no impact on the overall performance at 16 of the 24 screened intersections, based on level of service (LOS) and average peak-hour delays. Therefore, the project would be expected to have an overall beneficial impact on localized air quality. However, some intersections would experience an increase in volume or a degradation in LOS with the project.

TABLE 16
Intersections Screened for CO Analysis

State Route 47 and New Dock South Bound Off-Ramp
State Route 47 and New Dock North Bound On-Ramp
Alameda Street and Anaheim Street
Alameda Street and Pacific Coast Highway a/o Alameda Street
Alameda Street and Sepulveda Boulevard north of Sepulveda Boulevard
223rd Street and 1-405 South Bound Ramps
Alameda Street and Carson Street south of Carson St
Alameda Street and State Route 91 East Bound Ramps
Alameda Street and 223rd Street a/o Alameda Street
Alameda Street and Del Amo Boulevard east of Alameda Street
Ocean Boulevard Westbound and Henry Ford Avenue
Ocean Boulevard Westbound and SR-47
State Route 47 and Henry Ford Ramps
Henry Ford Avenue and Anaheim Street
Henry Ford Avenue and Denni Street
Alameda Street and Pacific Coast Highway north of Pacific Coast Highway
Alameda Street and 223rd Street south of 223rd Street

TABLE 16
Intersections Screened for CO Analysis

Alameda Street and 1-405 North Bound Ramps
Alameda Street and Del Amo Blvd south of Del Amo Boulevard
Alameda Street and Artesia Boulevard north of Artesia Boulevard
Alameda Street and Carson Street east of Alameda Street
Alameda Street and Sepulveda Boulevard east of Alameda Street
Ocean Boulevard Eastbound and Henry Ford Avenue
Ocean Boulevard Eastbound and SR-47

The *CO Protocol* recommends further analysis at signalized intersections where the LOS is downgraded to "E" or "F" as a result of the project (UCD, 1997). Using this criterion and considering the overall peak-hour volumes of traffic through the intersections, the following eight intersections were identified as areas where potential CO hot spots could occur:

- Henry Ford Avenue and Anaheim Street
- Alameda Street and Anaheim Street
- Alameda Street and Pacific Coast Highway north of Pacific Coast Highway
- Alameda Street and Sepulveda Boulevard north of Sepulveda Boulevard
- Alameda Street and Sepulveda Boulevard east of Alameda Street
- Alameda Street and 223rd St. south of 223rd Street
- Ocean Boulevard Westbound and SR-47
- Ocean Boulevard Eastbound and SR-47

Maximum 1-hour and 8-hour CO concentrations were estimated at each of the eight intersections for the build and the No-Build alternatives. Potential impacts were assessed for the base year, 2003, and multiple build alternatives for 2011 and 2030 using the respective PM peak-hour traffic projections (data provided by Meyer, Mohaddes Associates; see Appendix L-4).

The CO hot spot modeling was performed according to the methodology outlined in the *CO Protocol*. The Caltrans protocol recommends the use of CALINE4, with the comment that "The recommendation to use CALINE4 does not preclude the use of other models approved by EPA such as CAL3QHC" (UCD, 1997). For this analysis, CAL3QHC was chosen because of its ability to characterize and model signalized intersections. This includes the ability to evaluate the contribution from idling vehicles during red signal times. Emissions from an idling vehicle are typically much greater than emissions from a vehicle in motion.

CO emission factors were calculated with EMFAC2007, using default vehicle population data for the Basin. Running emissions were estimated using the average vehicle speeds provided by Meyer, Mohaddes Associates. The idling emission factor was calculated by multiplying the factor for 3 miles per hour (mph), in grams per second, by the speed (3 mph), per guidance provided in the MOBILE5 Information Sheet #2 (EPA, 1993). Parameters used in the EMFAC2007 modeling and the resulted emission factors are presented in Appendix L-2.

Using the emission factors from EMFAC, the CAL3QHC dispersion model was used to calculate the 1-hour CO concentrations in the vicinity of the affected intersections. The

8-hour CO concentrations were estimated using a persistence factor of 0.7, based on the generalized persistence factor for urban locations in the Caltrans *CO Protocol*; generalized persistence factors are likely to provide a conservative estimate in most situations (UCD, 1997).

Receptors were placed around the intersections at the four corners and at a distance of 25 m (82 ft) and 50 m (164 ft), respectively, along each approach. According to modeling guidance, the receptors were placed 3 m (9.8 ft) from the edge of the roadway to ensure that they were not within the mixing zone of the travel lanes. Although sidewalks do not exist around all the intersections, it was assumed that the public could have access to these locations. Concentrations were calculated at a receptor height of 1.8 m (5.9 ft). Other CAL3QHC model inputs are summarized in Table 17.

TABLE 17
CAL3QHC Input

Parameter	Description
Surface Roughness Coefficient	175 centimeters (representative of industrial/office park land use)
Signal Type	Actuated
Intersection Arrival Rate	Average Progression
Saturation Flow Rate	Provided by traffic forecast model
Clearance Lost Time	3 seconds

As indicated in the EPA Guidelines (EPA, 1992), and consistent with the Caltrans *CO Protocol*, the model was run using a meteorological condition of 1-meter- (3.28-ft) per-second wind speed; 1,000 m (3,280 ft) mixing height; and a moderately stable (Class E) atmosphere. Wind directions were evaluated in 5-degree increments.

Table 18 presents the peak 1-hour and 8-hour CO concentrations for the baseline conditions in 2003. The analysis shows that the maximum 1-hour CO concentration is well below the national standard of 35 ppm and the state standard of 20 ppm. The maximum 8-hour concentration is also well below the national and state standards of 9 ppm.

TABLE 18
Maximum Predicted CO Concentrations, Base Conditions (2003)

Intersection	Maximum 1-Hour CO Concentration (ppm)	Maximum 8-Hour CO Concentration (ppm)
Henry Ford Ave./Anaheim St.	7.1	5.8
Alameda St./Anaheim St.	7.1	5.8
Alameda St./Pacific Coast Highway north of Pacific Coast Highway	6.4	5.3
Alameda St./Sepulveda Blvd. north of Sepulveda	7.2	5.9
Alameda St./Sepulveda Blvd. east of Alameda	7.2	5.9
Alameda St./223rd St. south of 223rd St.	6.5	5.4
Ocean Blvd. Westbound/SR-47	N/A	N/A
Ocean Blvd. Eastbound/SR-47	N/A	N/A

TABLE 18
Maximum Predicted CO Concentrations, Base Conditions (2003)

Intersection	Maximum 1-Hour CO Concentration (ppm)	Maximum 8-Hour CO Concentration (ppm)
National Ambient Air Quality Standards	35	9
California Ambient Air Quality Standards	20	9

Notes:
1. Concentrations include a predicted 1-hour background concentration of 5.5 ppm and an 8-hour background concentration of 4.7 ppm, representing the highest measured CO concentrations in 2003.
2. Ocean Boulevard ramps do not exist in Base 2003 scenario.
3. A persistence factor of 0.7 to estimate 8-hour CO concentrations was chosen based on the generalized persistence factor for urban locations in the Caltrans *CO Protocol*. Generalized persistence factors are likely to provide a conservative estimate in most situations (UCD, 1997).

Table 19 presents the peak 1-hour and 8-hour CO concentrations predicted under both no build and buildout conditions (2011 and 2030). Alternative 1A would have the same impacts from traffic and air quality as Alternative 1. Alternative 3 is the bridge avoidance option, which has the same traffic and air quality impacts as Alternative 1. Alternative 4 is the bridge only option that has the same impacts as the No-Build alternative. There are no data available to evaluate the impacts from the TSM.

The modeled CO concentrations were combined with the predicted CO background concentrations and compared with the air quality standards. The maximum 1-hour CO concentration would be 6.5 ppm, which is well below the national standard of 35 ppm and the state standard of 20 ppm. The maximum 8-hour concentration is 4.9 ppm, which is below the national and state standard of 9 ppm. Based on the results of this analysis, the proposed project would not contribute to a violation of the CO standards. Therefore, localized CO impacts would be less than significant, and the local CO project-level transportation conformity requirements would be satisfied. Detailed CO hot spot modeling files are shown in Appendix L-3.

TABLE 19
Maximum Predicted CO Concentrations – Future Years

		Maximum 1-Hour CO Concentration (ppm)		Maximum 8-Hour CO Concentration (ppm)	
Intersection	**Alternative**	**2011**	**2030**	**2011**	**2030**
Henry Ford Ave./Anaheim St.	No Build	5.9	5.6	4.5	4.3
	Alt 1 - PM Peak Hour	5.8	5.6	4.4	4.3
	Alt 2 - PM Peak Hour	5.8	5.5	4.4	4.2
	Alt 3 - PM Peak Hour	5.8	5.6	4.4	4.3
	Alt 4 - PM Peak Hour	5.9	5.6	4.5	4.3
Alameda St./Anaheim St.	No Build	5.9	5.6	4.5	4.3
	Alt 1 - PM Peak Hour	5.8	5.6	4.4	4.3
	Alt 2 - PM Peak Hour	5.8	5.5	4.4	4.2
	Alt 3 - PM Peak Hour	5.8	5.6	4.4	4.3
	Alt 4 - PM Peak Hour	5.9	5.6	4.5	4.3

TABLE 19
Maximum Predicted CO Concentrations – Future Years

Intersection	Alternative	Maximum 1-Hour CO Concentration (ppm)		Maximum 8-Hour CO Concentration (ppm)	
		2011	2030	2011	2030
Alameda St./Pacific Coast Highway	No Build	5.6	5.4	4.3	4.1
	Alt 1 - PM Peak Hour	5.6	5.5	4.3	4.2
	Alt 2 - PM Peak Hour	5.5	5.3	4.2	4.0
	Alt 3 - PM Peak Hour	5.6	5.5	4.3	4.2
	Alt 4 - PM Peak Hour	5.6	5.4	4.3	4.1
Alameda St. North of Sepulveda Blvd.	No Build	6	5.8	4.5	4.4
	Alt 1 - PM Peak Hour	6.2	5.8	4.7	4.4
	Alt 2 - PM Peak Hour	6.5	5.7	4.9	4.3
	Alt 3 - PM Peak Hour	6.2	5.8	4.7	4.4
	Alt 4 - PM Peak Hour	6	5.8	4.5	4.4
Sepulveda Blvd. east of Alameda St.	No Build	6	5.8	4.5	4.4
	Alt 1 - PM Peak Hour	6.2	5.8	4.7	4.4
	Alt 2 - PM Peak Hour	6.5	5.7	4.9	4.3
	Alt 3 - PM Peak Hour	6.2	5.8	4.7	4.4
	Alt 4 - PM Peak Hour	6	5.8	4.5	4.4
Alameda St./223rd St.	No Build	5.6	5.5	4.3	4.2
	Alt 1 - PM Peak Hour	5.7	5.4	4.3	4.1
	Alt 2 - PM Peak Hour	5.6	5.6	4.3	4.3
	Alt 3 - PM Peak Hour	5.7	5.4	4.3	4.1
	Alt 4 - PM Peak Hour	5.6	5.5	4.3	4.2
Ocean Blvd. Westbound/SR-47	No Build	5.5	5.5	4.2	4.2
	Alt 1 - PM Peak Hour	5.7	5.4	4.3	4.1
	Alt 2 - PM Peak Hour	5.7	5.4	4.3	4.1
	Alt 3 - PM Peak Hour	5.7	5.4	4.3	4.1
	Alt 4 - PM Peak Hour	5.5	5.5	4.2	4.2
Ocean Blvd. Eastbound/SR-47	No-Build	5.5	5.5	4.2	4.2
	Alt 1 - PM Peak Hour	5.7	5.4	4.3	4.1
	Alt 2 - PM Peak Hour	5.7	5.4	4.3	4.1
	Alt 3 - PM Peak Hour	5.7	5.4	4.3	4.1
	Alt 4 - PM Peak Hour	5.5	5.5	4.2	4.2

TABLE 19
Maximum Predicted CO Concentrations – Future Years

Intersection	Alternative	Maximum 1-Hour CO Concentration (ppm)		Maximum 8-Hour CO Concentration (ppm)	
		2011	2030	2011	2030
National Ambient Air Quality Standards		35		9	
California Ambient Air Quality Standards		20		9	

Notes:
1. Concentrations include a predicted 1-hour background concentration of 5.1 ppm and an 8-hour background concentration of 3.9 ppm in 2011 and 2030. These are the predicted future concentrations for 2010 and 2030 from SCAQMD Projected Future Year CO Concentrations. http://www.aqmd.gov/ceqa/handbook/CO/CO.html.
2. A persistence factor of 0.7 to estimate 8-hour CO concentrations was chosen based on the generalized persistence factor for urban locations in the CO Protocol. Generalized persistence factors are likely to provide a conservative estimate in most situations (UCD, 1997).
3. The NAAQS for CO are 35 ppm (1-hour) and 9 ppm (8-hour). The CAAQS for CO are 20 ppm (1-hour) and 9 ppm (8-hour).

The majority of the project will be complete by 2011; the flyover at Ocean Boulevard and SR-47 will be complete in 2015. CO hotspot modeling for 2015 was performed for the two intersections that are affected by the flyover; the results are shown in Table 20.

TABLE 20
Maximum Predicted CO Concentrations – 2015

Intersection	Alternative	Maximum 1-Hour CO Concentration (ppm)	Maximum 8-Hour CO Concentration (ppm)
		2015	2015
Ocean Blvd. Westbound/SR-47	No-Build	5.6	4.3
	Alt 1 - PM Peak Hour	5.7	4.3
	Alt 2 - PM Peak Hour	5.5	4.2
	Alt 3 - PM Peak Hour	5.7	4.3
	Alt 4 - PM Peak Hour	5.6	4.3
Ocean Blvd. Eastbound/SR-47	No-Build	5.6	4.3
	Alt 1 - PM Peak Hour	5.7	4.3
	Alt 2 - PM Peak Hour	5.5	4.2
	Alt 3 - PM Peak Hour	5.7	4.3
	Alt 4 - PM Peak Hour	5.6	4.3
National Ambient Air Quality Standards		35	9
California Ambient Air Quality Standards		20	9

Notes:
1. Concentrations include a predicted 1-hour background concentration of 5.1 ppm and an 8-hour background concentration of 3.9 ppm in 2015. These are the predicted future concentrations for 2015 from SCAQMD CO Concentrations, http://www.aqmd.gov/ceqa/handbook/CO/CO.html.
2. The maximum 8-hour CO concentration is calculated by multiplying the project level 1-hour CO contribution by the 8-hour persistence factor (0.7) and adding the 8-hour CO background concentration.
3. The NAAQS for CO are 35 ppm (1-hour) and 9 ppm (8-hour). The CAAQS for CO are 20 ppm (1-hour) and 9 ppm (8-hour).

4.4.5 Localized PM_{10} and $PM_{2.5}$ Impacts

Projects are subject to conformity requirements for PM_{10} and $PM_{2.5}$ if they are located in a federal nonattainment or maintenance area. Because the RTIP air quality analysis must show that the transportation system would meet the regional emission budgets, inclusion of the project in a conforming RTIP or RTP would indicate that, by definition, the project would not cause a significant regional PM_{10} or $PM_{2.5}$ impact. The Schuyler Heim Bridge/ SR-47 project is included in the conforming 2008 RTP and the Adopted 2008 RTIP; therefore, the project would not cause a significant regional PM_{10} or $PM_{2.5}$ impact.

On March 10, 2006, EPA issued amendments to the Transportation Conformity Rule to address localized impacts of particulate matter: "*$PM_{2.5}$ and PM_{10} Hot-Spot Analyses in Project-level Transportation Conformity Determinations for the New $PM_{2.5}$ and Existing PM_{10} National Ambient Air Quality Standards*" (71 FR 12468). As required by the amended transportation conformity rule, a qualitative $PM_{2.5}$ hot spot analysis is included in this report as part of the project-level conformity analysis. As stated in the 2006 PM Guide, "any PM_{10} hot-spot analysis that was started prior to this release…may be completed with the previous guidance." Therefore, the PM_{10} hot-spot analysis was completed following previous guidance (PM_{10} Protocol). The following section presents the PM_{10} hotspot analysis followed by the $PM_{2.5}$ hotspot analysis.

4.4.5.1 Localized PM_{10} Impacts

At the local scale, a qualitative PM_{10} hot spot analysis was performed for the project following the *Technical Report: Particulate Matter and Transportation Project Analysis Protocol* (PM_{10} protocol) (UCD, Caltrans, FHWA; 2005). The PM_{10} protocol includes methodologies to screen projects that are unlikely to contribute to an exceedance of PM_{10} air quality standards in maintenance or nonattainment areas. For projects in a PM_{10} nonattainment area, the protocol specifies three methods to evaluate PM_{10} impacts: 1) a "project comparison" approach to compare the PM_{10} impacts with similar projects; 2) a "threshold screening" analysis that takes advantage of real-world measurements of the contribution of roadways to observed PM_{10} concentrations, and 3) a "relocate-and-reduce, build-vs.-no-build" approach that assesses whether a project would spatially reallocate traffic to reduce hot spot problems. The PM_{10} hot spot analysis was performed using the "threshold screening" method, which includes both 24-hour and annual screening tests. Although the federal annual PM_{10} standard was revoked effective in December 2006, the PM_{10} hotspot analysis was completed prior to EPA rescinding the standard and includes a discussion of the annual standard.

4.4.5.1.1 24-hour PM_{10} Screening Test

The PM_{10} screening test is a conservative approach to evaluating the potential incremental PM_{10} contribution from a project. The first step of the screening test does not use any project-specific data. This step conservatively assumes that the incremental increase in the PM_{10} ambient concentrations due to a project would be 29.6 $\mu g/m^3$. This value was the highest PM_{10} contribution of all roadway type projects observed in the available literature (Ashbaugh et al., 1996; UCD, Caltrans, and FHWA, 2005). Because the 24-hour PM_{10} NAAQS is 150 $\mu g/m^3$, the proposed projects would be considered not to cause a hot spot violation if the 24-hour background concentration of the area is less than 120 $\mu g/m^3$ (150 $\mu g/m^3$ minus 29.6 $\mu g/m^3$), or 80 percent of the NAAQS. If a project passes the first-step

screening, it would be unlikely to cause a PM_{10} hot spot violation, and no further analysis would be required. Otherwise, the screening test needs to be refined using project-specific information.

As shown in Table 2, no violations of the 24-hour federal PM_{10} standard have been recorded at the nearest PM_{10} monitoring station, North Long Beach Station, for the past 3 years (2004 through 2006). The data from 2004 through 2006 show that maximum 24-hour concentrations of PM_{10} during each year were 72, 66, and 78 μg/m^3, respectively, or 48, 44, and 52 percent of the NAAQS. Because ambient concentrations are less than 120 μg/m^3, or 80 percent of the NAAQS, and no unusual circumstances are expected with the project compared to existing conditions, the proposed project would be unlikely to contribute to a violation of the 24-hour PM_{10} NAAQS.

4.4.5.1.2 Annual PM_{10} Screening Test

4.4.5.1.2.1 Refined Screening Test

The approach of the annual PM_{10} screening test is similar to the 24-hour PM_{10} screening test, except that the field data were unavailable to directly estimate annual roadway incremental PM_{10} contributions. Consequently, the annual increment should be estimated by applying a conversion ratio (CR) to convert the 24-hour increment value to annual values using the following equation:

$$\text{Annual } PM_{10} \text{ increment} = CR \times \text{24-hour } PM_{10} \text{ increment} \qquad \text{(Equation 1)}$$

The worst-case CR value of all counties in California was 0.60 as specified in Appendix C of the *PM_{10} Protocol*. Using the worst-case 24-hour PM_{10} increment of 29.6 μg/m^3, the worst-case annual PM_{10} incremental increase of a project would be 17.8 μg/m^3 (29.6 μg/m^3 x 0.60). Because the NAAQS for annual PM_{10} is 50 μg/m^3, a project would pass the general screening if the project area background annual PM_{10} concentration is less than 32 μg/m^3 (50 μg/m^3 minus 17.8 μg/m^3).

As shown in Table 2, the highest background annual PM_{10} concentrations measured at the North Long Beach Station during the last 3 years was 33 μg/m^3. The background concentration is greater than 32 μg/m^3 and would result in a total concentration exceeding the NAAQS of 50 μg/m^3 when combined with the worst-case 17.8 μg/m^3 increment. Based on these results, a refined screening analysis was performed using project-specific information.

4.4.5.1.2.2 Refined Screening Test

For this level of analysis, the project must be classified as one of five types of facilities (intersection, freeway, arterial, collector, or local). Two of the categories (intersection and freeway) are subdivided by projected vehicle count. The build alternatives of the proposed project include construction of the Schuyler Heim Bridge and the SR-47 or SR-103 expressway; therefore, the project was considered as the freeway facility type. The maximum vehicle volume of the expressway would be less than 5,517 vehicles per hour. To be conservative, the 24-hour PM_{10} incremental increase of 5.3 μg/m^3 for the vehicle volume of 5,517 per hour (Cahill, et al., 1994) listed in Table 3 of the PM_{10} Protocol was used in the analysis. The worst-case CR value of Los Angeles County is 0.55, as listed in Appendix C of the PM_{10} Protocol. The estimated annual PM_{10} increment calculated by Equation 1 would be 2.9 μg/m^3 due to the project.

The projected PM_{10} increment due to the project was compared to the allowable annual increment threshold to determine if any PM_{10} hot spot problems would occur during operation of the project. The maximum allowable annual increment of PM_{10} was 17 µg/m^3, calculated using the following equation:

Allowable annual project increment (µg/m^3) = 50 µg/ m^3 (annual NAAQS) – 33 µg/ m^3 (annual background) (Equation 2)

Because the estimated project increment of PM_{10} was 2.9 µg/m^3, less than the annual PM_{10} increment threshold of 17 µg/m^3, it was concluded that a PM_{10} hot spot violation of the annual standard would not occur as a result of the proposed project.

4.4.5.1.3 Conclusion

Following the PM_{10} Protocol, the proposed project has passed the project-level transportation conformity screening tests. The project would be unlikely to cause or contribute to a violation of the 24-hour and annual PM_{10} NAAQS.

4.4.5.2 Localized $PM_{2.5}$ Impacts

On March 10, 2006, EPA issued amendments to the Transportation Conformity Rule to address localized impacts of particulate matter: "*$PM_{2.5}$ and PM_{10} Hot-Spot Analyses in Project-level Transportation Conformity Determinations for the New $PM_{2.5}$ and Existing PM_{10} National Ambient Air Quality Standards*" (71 FR 12468). This amendment requires the assessment of localized air quality impacts in $PM_{2.5}$ and PM_{10} nonattainment and maintenance areas for projects of air quality concern. This assessment of localized impacts (i.e., "hot-spot analysis") examines potential air quality impacts on a scale smaller than an entire nonattainment or maintenance area. Such an analysis is a means of demonstrating that a transportation project meets CAA conformity requirements to support state and local air quality goals. Since the proposed project is located in a federal nonattainment area for $PM_{2.5}$, localized impacts must be assessed. Appendix M contains the detailed $PM_{2.5}$ Hot-Spot Analysis that will be submitted to the SCAG Transportation Conformity Working Group.

The EPA specified in 40 CFR 93.123(b)(1) of the final rule that projects of air quality concern are certain highway and transit projects that involve significant levels of diesel vehicle traffic, or any other project that is identified in the $PM_{2.5}$ or PM_{10} SIP as a localized air quality concern. According to 40 CFR 93.123(b)(2) and (4), a quantitative analysis for applicable projects is not required until EPA releases modeling guidance in the Federal Register. However, a qualitative hot-spot analysis is required for projects of air quality concern. This qualitative analysis of localized $PM_{2.5}$ impacts was prepared because the proposed project has the potential to be a project of air quality concern.

4.4.5.2.1 Hot-Spot Analysis Methodology

The qualitative $PM_{2.5}$ hot-spot analysis was performed following the Transportation Conformity Guidance for Qualitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas (EPA, 2006) [PM Guide]. The proposed project is located in Los Angeles County, which is designated as nonattainment for the federal $PM_{2.5}$ standards and is required to attain and maintain the NAAQS. The current $PM_{2.5}$ 24-hour standard (35 µg/m^3) became effective on December 17, 2006. However, the nonattainment designations are based on the previous 24-hour standard of 65 µg/m^3. Therefore, $PM_{2.5}$

conformity for the proposed action was evaluated for the 24-hour standard of 65 μg/m^3 and annual standard of 15 μg/m^3.

Based on the project types listed in the PM Guide, the proposed project would be categorized as a new or expanded highway project that would have a significant number of diesel vehicles, and would affect intersections that are at LOS D, E, or F with a significant number of diesel vehicles. The proposed project would be considered a project of air quality concern based on the criteria listed in the Final Conformity Rule (40 CFR 93.123 [b][1]). Therefore, a qualitative project-level hot-spot assessment was conducted in order to assess whether the project will cause or contribute to any new localized $PM_{2.5}$ violations, or increase the frequency or severity of any existing violations, or delay timely attainment of the $PM_{2.5}$ NAAQS.

This analysis was based on directly emitted emissions, including tailpipe, brake wear, and tire wear, because the direct emissions have the potential to cause nearby hot-spots, or localized areas of elevated concentration. Re-entrained road dust was also included in the analysis. The emission inventories presented in the SCAQMD 2007 AQMP show that emissions from paved roads comprise the single largest contributor to directly emitted $PM_{2.5}$ emissions. Construction-related $PM_{2.5}$ emissions were not included in this hot-spot analysis because these emissions would be considered temporary since construction would last less than 5 years (40 CFR 93.123[c][5]). Secondary $PM_{2.5}$ emissions would be associated with regional impacts and, therefore, are not included in a hot-spot analysis.

4.4.5.2.2 Existing Air Quality

The North Long Beach monitoring station, located approximately 8 km (5 mi.) northeast of Schuyler Heim Bridge, was used to represent ambient air in the project area. The maximum 24-hour $PM_{2.5}$ concentration measured at the North Long Beach station during the years of 2001 to 2006, inclusive, was 115.2 μg/m^3 in 2003. The maximum annual concentration (arithmetic mean) for the same time period was 21.2 μg/m^3 in 2001. The annual average $PM_{2.5}$ NAAQS was exceeded in 5 of the 6 years, and the 24-hour average $PM_{2.5}$ NAAQS was exceeded in 3 of the 6 years. However, the annual $PM_{2.5}$ concentrations in the Long Beach area show declines over the last 6 years, with an 33 percent decrease of the annual concentrations. Detailed $PM_{2.5}$ monitoring data during the years of 2001 through 2006 are presented in Appendix M.

The following discussion demonstrates that $PM_{2.5}$ concentrations at the North Long Beach monitoring station are representative of the project area. The traffic data near the North Long Beach monitoring station and the Long Beach-East Pacific Coast Highway monitoring station were reviewed to evaluate the relationship between traffic conditions and monitoring data. The Long Beach-East Pacific Coast Highway station was selected for comparison since it is located closer to the project area than the North Long Beach station. However, because the Long Beach-East Pacific Coast Highway station has only been operating since 2003, data from this station were not used in the hotspot analysis.

The annual average daily traffic (AADT) and truck percentages near the North Long Beach monitoring station and Long Beach-East Pacific Coast Highway monitoring station were reviewed. The North Long Beach station is located approximately 0.5 mile north of I-405 and one mile east of the I-405/I-710 junction. For the year 2006, the AADT at the I-405/I-710 junction was 290,000 (Caltrans, 2008b). In addition, the truck AADT for the largest trucks

(5 axles) was 6,856, or 2.4 percent of the total AADT (Caltrans, 2008b). For comparison, the Long Beach-East Pacific Coast Highway monitoring station is located approximately 1 mile east of the Pacific Coast Highway (PCH) /I-710 junction. For the year 2006, the AADT at the PCH/ I-710 junction was 48,000 (Caltrans, 2008b). In addition, the truck AADT for the largest trucks (5 axles) was 5,130, or 11 percent of the total AADT (Caltrans, 2008b). A review of the traffic data has shown that the largest truck volumes are similar for both monitoring stations.

In addition, the $PM_{2.5}$ monitoring values at the Long Beach-East Pacific Coast Highway monitoring station are similar to those at the North Long Beach monitoring station. For the years 2004, 2005, 2006 the 24-hour $PM_{2.5}$ concentrations measured at the Long Beach-East Pacific Coast Highway were 59.7 $\mu g/m^3$, 50.8 $\mu g/m^3$, and 53.6 $\mu g/m^3$, respectively. Comparing these concentrations to the concentrations reported in Table 2 for the North Long Beach station show the values are similar. Therefore, since the truck percentages and monitoring data at the North Long Beach station and Long Beach-East Pacific Coast Highway station are similar, the North Long Beach station reflects the same traffic conditions as at the project location, and the monitoring data are shown to be representative of ambient air quality for the project area.

4.4.5.2.3 Traffic Condition Improvement by Proposed Action

The purpose of building the SR-47 Expressway or the SR-103 Extension along with the Schuyler Heim Bridge replacement is to reduce traffic congestion on local surface streets between Terminal Island and Pacific Coast Highway or I-405, as well as on I-110 and I-710. The project would also improve traffic conditions by eliminating at-grade railroad crossings and signalized intersections.

As a result of the proposed project, the delays due to traffic congestion would be reduced, and the average vehicle travel speed would slightly increase in the project area. Both of these effects would translate into decreased vehicle emissions. In 2030, the LOS at the intersections within the project area would be improved by implementing the build Alternatives of 1, 1A, 2, or 3. Table 21 compares the PM peak hour intersection conditions of the No Build alternative to the build alternatives. Among the 22 intersections analyzed, the LOS of Alternatives 1, 1A, and 3 would improve at six intersections compared to the no build alternative. The LOS of Alternative 2 would improve at four of the intersections. Two intersections, 223rd Street/Alameda Street Connector Ramp at Alameda Street and the 223rd Street and I-405 southbound ramps, would have a worse LOS when compared to the no build alternative.

Table 22 presents the VMT within the project area for the No Build and build alternatives. Alternative 1 would have less total VMT when compared to the No Build alternative. There would be an approximate 2 percent increase in VMT for Alternative 2 when compared to Alternative 1 due to the increase in capacity of the extended SR-103. The truck percentages of the build alternatives are similar to those of the No Build alternative within the same year. The percentage of port trucks is expected to increase between 2003 and 2030, while the percentage of other trucks is expected to decrease.

TABLE 21
2030 PM Peak Intersection Conditions (PCE)

Intersections	No Build (Alternative 6), Alternative 4	Alternative 1, 1A, 3	Alternative 2
SR-47 & New Dock SB Off-Ramp 1	B	B	B
SR-47 & New Dock NB On-Ramp 1	E	C	C
SR-47 & Henry Ford Ramps	F	C	E
Henry Ford Ave. & Anaheim St.	F	F	F
Henry Ford Ave. & Denni St.	D	C	D
Alameda St. & Anaheim St.	F	F	F
Alameda St./PCH Connector Ramp n/o Pacific Coast Highway	F	F	B
Pacific Coast Highway/Alameda St. Connector Ramp e/o Alameda St.	F	F	E
Alameda St./Sepulveda Blvd. Connector Ramp n/o Sepulveda	F	F	F
Sepulveda Blvd./Alameda St. Connector Ramp e/o Alameda St.	F	E	E
Alameda St./223rd St Connector Ramp s/o 223rd St.	F	F	F
223rd St./Alameda St. Connector Ramp e/o Alameda St.	E	F	F
223rd St. & I-405 SB Ramps	B	C	C
Alameda St. & I-405 NB Ramps	C	C	C
Alameda St./Carson St. Connector Ramp s/o Carson St.	C	B	C
Carson St./Alameda St. Connector Ramp e/o Alameda St.	A	A	A
Alameda St./Del Amo Blvd. Connector Ramp s/o Del Amo	D	C	C
Del Amo Blvd./Alameda St. Connector Ramp e/o Alameda St.	C	A	B
Alameda St. & SR-91 EB Ramps	A	A	A
Alameda St. & Artesia Blvd. n/o Artesia Blvd.	A	A	A

Data provided by Meyer, Mohaddes Associates, 2007.

An increase of $PM_{2.5}$ emissions would occur if the project significantly increased VMT in the project area, and at locations where there are more traffic delays. The traffic delays would occur at the intersections where vehicles are accumulating and idling. It is unlikely that $PM_{2.5}$ hot-spots would be associated with the proposed project because local accumulation and delay of vehicles would be reduced by the project. Table 21 shows that LOS improves with the build alternatives when compared to the No Build alternative. Potential localized $PM_{2.5}$ increases associated with the slight increase in VMT (see Table 22) would be offset by the increase of vehicle speed in the project area, which is an indication of reduced congestion and idling of vehicles. Thus, the project is not expected to cause any concern with respect to localized concentrations $PM_{2.5}$ (see the following sections for more detailed emission calculations).

TABLE 22
Daily Vehicle Miles Traveled and Percentages within the Project Area

Project Alternative	Cars		Port Trucks		Other Trucks		Total VMT
	Daily VMT	Percent of Total VMT	Daily VMT	Percent of Total VMT	Daily VMT	Percent of Total VMT	
2003 - Existing	3,762,790	86.6%	446,582	10.3%	133,242	3.1%	4,342,614
2011 - No Build, Alternative 4	3,683,868	85.2%	509,987	11.8%	128,848	3.0%	4,322,704
2011 - Alternative 1, 1A, 3	3,696,964	85.5%	496,472	11.5%	128,981	3.0%	4,322,417
2011 - Alternative 2	3,857,134	87.3%	454,902	10.3%	105,845	2.4%	4,417,883
2015 - No Build, Alternative 4	3,867,096	83.9%	609,988	13.2%	131,813	2.9%	4,608,899
2015 - Alternative 1, 1A, 3	3,881,725	84.3%	593,061	12.9%	132,236	2.9%	4,607,023
2015 - Alternative 2	3,913,907	84.1%	604,778	13.0%	133,812	2.9%	4,652,497
2030 - No Build, Alternative 4	4,384,500	81.1%	874,743	16.2%	144,870	2.7%	5,404,114
2030 - Alternative 1, 1A, 3	4,407,170	81.6%	845,124	15.7%	146,453	2.7%	5,398,748
2030 - Alternative 2	4,436,443	81.5%	858,343	15.8%	146,750	2.7%	5,441,537

Data provided by Meyer, Mohaddes Associates.

In conclusion, review of the existing and projected traffic conditions has shown that the proposed project would improve the operations of the intersections and increase vehicle speeds in the project area. It is unlikely that $PM_{2.5}$ emissions associated with the proposed project would cause significant adverse impact to air quality.

4.4.5.2.4 Direct Operational Emissions

4.4.5.2.4.1 Vehicle Operational Emissions

To further illustrate that the proposed project would not cause a significant adverse impact to the ambient air quality, vehicle operation emissions of $PM_{2.5}$ were estimated and compared with the No Build alternative. The emissions analysis was performed for the entire project study area because the proposed improvements along the Schuyler Heim Bridge, SR-47, or SR-103 corridors would likely affect vehicle traffic patterns on other nearby roads, not just along the roadways with proposed improvements. As a result, traffic conditions and vehicle emissions would be affected by the project in a broader area. The project study area includes the area between I-710, I-110, I-405, and Ocean Boulevard.

4.4.5.2.4.2 Vehicle Exhaust Emissions

$PM_{2.5}$ emissions from vehicles traveling in the project study area were calculated for the years 2003, 2011, 2015, and 2030. Daily VMT data for 2003, 2011, 2015, and 2030 were provided by Meyer, Mohaddes Associates (see Appendix L for details).

$PM_{2.5}$ emissions were estimated for Alternatives 1, 1A, 2, 3, and the No Build alternative (Alternative 6). Emission factors for $PM_{2.5}$ were obtained from EMFAC2007 (CARB, 2007). Emissions were calculated based on three major categories of vehicles: autos, heavy duty trucks (regional), and port trucks. Emissions from autos were calculated using EMFAC2007 emission factors representing the Los Angeles County vehicle mix. To be conservative, $PM_{2.5}$ emissions from regional and port trucks were calculated using the EMFAC2007 emission factors for heavy duty diesel trucks. The emission factors selected from the EMFAC2007 results were based on the average vehicle speeds. Detailed emission calculations are shown in Appendix L-2.

As shown in Table 23, $PM_{2.5}$ emissions from Alternatives 1, 1A, 2, and 3 would be slightly lower than those from the No-Build alternative. The emissions in Table 5 were conservatively estimated based on the average vehicle speed for the entire project area. The emissions decrease for Alternative 1, 1A, and 3 are due to a predicted decrease in VMT in the study area and an increase in vehicle speed for 2011, 2015, and 2030. Although there would be a slight increase in VMT for Alternative 2, due to increased capacity from the extension of SR-103, the $PM_{2.5}$ emissions for Alternative 2 in 2011 and 2030 would still be less than the No Build alternative. However, in the year 2015, there would be a greater number of 'other truck' VMT (see Table 22) for Alternative 2, which would result in slightly higher emissions when compared to the No Build alternative.

Emissions for Alternative 4 are predicted to be the same as those for the No-Build alternative because the VMT and vehicle mix in the project area is predicted to be the same. Emissions for Alternative 3 are predicted to be the same as those for Alternative 1 because Alternative 3 would have the same traffic conditions as Alternative 1. Emissions associated with Alternative 5 were not discussed in this analysis because there is no traffic information available for Alternative 5.

TABLE 23
Daily Vehicle Emissions for the Project Study Area

Project Alternative	2003	2011	2015	2030
	$PM_{2.5}$ (lb/day)	$PM_{2.5}$ (lb/day)	$PM_{2.5}$ (lb/day)	$PM_{2.5}$ (lb/day)
No Build	901	669	577	455
Alternative 1, 1A	__	665	574	441
Alternative 2	__	632	582	445
Alternative 3	__	665	574	441
Alternative 4	__	669	577	455

4.4.5.2.4.3 Re-entrained Road Dust

Re-entrained road dust was estimated based on VMT and Chapter 13.2.1 of *AP-42, Fifth Edition, Compilation of Air Pollutant Emission Factors* (EPA, 2006). The emission inventories presented in the SCAQMD 2007 AQMP show that emissions from paved roads comprise the single largest contributor to directly emitted $PM_{2.5}$. According to the PM Guide, $PM_{2.5}$ emissions from re-entrained road dust must only be considered if the EPA or state air agency have made a finding that these emissions are a significant contributor to the $PM_{2.5}$ problem in a given area (40 CFR 93.102[b][3]). Since the SCAQMD 2007 AQMP is incorporated as part of the California 2007 SIP, $PM_{2.5}$ from re-entrained roads was included in the hotspot analysis.

Table 24 presents the paved road emissions for the years 2003, 2011, 2015, and 2030. The $PM_{2.5}$ emissions for the build alternatives would be the same or less than those from the No Build alternative for each year analyzed. Paved road emissions are expected to increase with time because the calculation of paved road emissions is based on VMT and vehicle weight. Since the VMT and the percentage of trucks are predicted to increase with time, the paved road emissions would also increase with time. This finding is consistent with the emission inventories reported in the SCAQMD 2007 AQMP, which also show paved road emissions increasing with time. Since paved road emissions are included in the 2007 AQMP, which is part of the California SIP, paved road emissions have been accounted for as part of the $PM_{2.5}$ attainment plan. Therefore, the proposed project is unlikely to cause new violations or increase the frequency or severity of any existing violations, or delay timely attainment of the $PM_{2.5}$ NAAQS.

TABLE 24
Daily Vehicle Re-Entrained Road Dust Emissions for the Project Study Area ($PM_{2.5}$)

Project Alternative	2003	2011	2015	2030
	lb/day	lb/day	lb/day	lb/day
No Build	6,430	7,182	8,448	11,941
Alternative 1, 1A	--	7,010	8,232	11,554
Alternative 2	--	6,181	8,393	11,724
Alternative 3	--	7,010	8,232	11,554
Alternative 4	--	7,182	8,448	11,941

Overall, $PM_{2.5}$ emissions of the build alternatives would be the same or less than those of the No Build alternative. In addition, the exhaust emissions in 2030 would be much lower than those in 2011 (project opening year), attributed to the addition of newer vehicles with greater emission controls in future years. Based on the current ambient $PM_{2.5}$ concentrations in the project area, the project is not expected to have a significant localized $PM_{2.5}$ concentration increase when compared to the No Build alternative. Therefore, the project meets the conformity hot-spot requirements in 40 CFR §93.116 and §93.123 for $PM_{2.5}$.

4.4.5.2.5 Conclusion

Overall, $PM_{2.5}$ emissions of the build alternatives would be the same or less than the No Build alternative. In addition, exhaust emissions in 2030 would be much lower than those in 2011 (project opening year), attributed to the addition of newer vehicles with greater emission controls in future years. Based on the current ambient $PM_{2.5}$ concentrations in the project area, the project is not expected to have a significant localized $PM_{2.5}$ concentration increase when compared to the No Build alternative. The proposed project is unlikely to cause new violations or increase the frequency or severity of any existing violations, or delay timely attainment of the $PM_{2.5}$ NAAQS. Therefore, the project meets the conformity hot-spot requirements in 40 CFR §93.116 and §93.123 for $PM_{2.5}$.

4.4.6 Mobile Source Air Toxics

On February 3, 2006, FHWA issued the following guidance: "*Interim Guidance on Air Toxic Analysis for National Environmental Policy Act (NEPA) Documents*" (Interim Guidance) to address MSAT from transportation projects. The purpose of the Interim Guidance is to provide advice for analyzing MSAT emissions as part of the NEPA process for highway projects. MSATs emissions for the proposed action were evaluated for the Existing Condition (2003) and for the No-Build alternative, Alternative 1, and Alternative 2 for the years 2011, 2015, and 2030. Appendix N contains the detailed MSATs analysis, as summarized below.

The Interim Guidance identified the following three levels of MSAT analysis and examples of projects for each level:

1. No analysis for projects with no potential for meaningful MSAT effects: for example, projects qualifying as a categorical exclusion under 23 CFR 771.117(c), projects exempt under the CAA conformity rule under 40 CFR 93.126, or other projects with no meaningful impacts on traffic volumes or vehicle mix.
2. Qualitative analysis for projects with low potential MSAT effects: for example, minor widening projects, new interchanges, projects that improve operations of highways, transit, or freight without adding substantial new capacity or without creating a facility that is likely to meaningfully increase emissions.
3. Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects. Projects that would be in this category must:
    a. Create or significantly alter a major intermodal freight facility that has the potential to concentrate high levels of DPM in a single location; or
    b. Create new or add significant capacity to urban highways such as interstates, urban arterials, or urban collector-distributor routes with traffic volumes

where the average annual daily traffic (AADT) is projected to be in the range of 140,000 to 150,000 or greater by the design year; **AND**

c. Proposed to be located in proximity to populated areas or in rural areas in proximity to concentrations of vulnerable populations (i.e. schools, nursing homes, hospitals).

Upon reviewing the alternatives and the Interim Guidance analysis levels described above, it was concluded that a quantitative analysis was the appropriate level for the proposed action. The major arterials affected by the project serve a large number of diesel trucks, and there would be a potential to concentrate high levels of DPM. In addition, the immediate vicinity of the project area includes the community of Wilmington in Los Angeles. The community of Wilmington is just west of the proposed SR-47 Expressway and includes sensitive air quality receptors such as residences, schools, and hospitals. The project qualifies for a quantitative MSAT analysis because: (1) the project would serve diesel trucks with the potential to concentrate DPM; and (2) sensitive receptors are within the project area and near the project site.

Since Alternative 3 would have the same traffic conditions as Alternative 1, and Alternative 4 would not affect the traffic conditions when compared to the No-Build alternative, it was assumed that Alternatives 3 and 4 would have the same MSAT emissions as Alternatives 1 and 6, respectively. In addition, a traffic analysis was not performed for Alternative 5. Therefore, the MSAT analysis will only include a discussion of Alternatives 1, 2, and 6.

4.4.6.1 Methodology

MSAT emissions were estimated using the methodology and software tool developed by the University of California at Davis (UCD) in cooperation with Caltrans. The guidance, *Estimating Mobile Source Air Toxics Emissions: A Step-by-Step Project Analysis Methodology* (UCD, 2006a), and software tool *Project-Level Mobile Source Air Toxics Analysis: Spreadsheet Tool*, version 1.2 (UCD, 2006b) (MSAT Tool), were used to develop benzene, acrolein, acetaldehyde, 1,3-butadiene, and formaldehyde emission factors from EMFAC2007 total organic gas (TOG) emission factors. The diesel particulate matter emission factors from EMFAC2007 were used to estimate diesel truck emissions. Emissions were estimated for automobiles, SCAG trucks, and port trucks for the major roadway segments in the project area. It was conservatively assumed that all port trucks in the years 2015 and 2030 would be heavy duty trucks. EMFAC2007 is the on-road emissions model developed and updated by CARB. The EMFAC2007 emission factors used in the analysis were for the South Coast Air Basin. MSAT emissions for the proposed project were evaluated for the Existing Condition (2003) and the No-Build alternative, Alternative 1, and Alternative 2 for the years 2015 and 2030.

Since Alternative 3 would have the same traffic conditions as Alternative 1, and Alternative 4 would not affect the traffic conditions when compared to the No Build alternative, it was assumed that Alternatives 3 and 4 would have the same MSAT emissions as Alternatives 1 and 6, respectively. In addition, a traffic analysis was not performed for Alternative 5. Therefore, the MSAT analysis only includes a discussion of Alternatives 1, 2, and 6.

4.4.6.2 Project-Specific Data

Appendix N presents the project-specific data used to estimate MSAT emissions. MSAT emissions were estimated based on vehicle type, posted vehicle speeds, vehicle volume, and segment length. MSAT emissions were evaluated by roadway segments contained within the boundary of Highway 91 to the north, Interstate 110 (I-110) to the west, Interstate 710 (I-710) to the east, and Ocean Boulevard to the south. The following is a list of the roadway segments included in the MSAT analysis. Not all the roadway segments were included with each alternative. For example, the segment SR-103, Realignment to End (23rd and Wardlow) was only included for Alternative 2. Appendix N contains a summary of the segments, segment lengths, posted vehicle speeds, and daily traffic volumes for each alternative.

Currently, significance criteria have not been established to evaluate the significance of air toxic emissions from individual transportation projects. Therefore, the following discussion of MSAT results will be a comparison of emissions by alternative rather than a discussion of the specific values.

- SR-47 Mainline, New Dock Ramps to Henry Ford Ramps
- Henry Ford Ramps
- Henry Ford north of Ramps to Alameda
- SR-103 begin (at SR-47 /Henry Ford Junction) to Anaheim
- SR-103 Anaheim to Pacific Coast Highway (PCH)
- SR-103 PCH to Realignment (Sepulveda/Willow ramps)
- SR-103 Ramps south of Sepulveda/Willow
- SR-103, Realignment to End (223rd/Wardlow)
- E and W Harry Bridges, Figueroa to start Alameda
- Alameda beginning (E Harry Bridges) to Anaheim
- Alameda Anaheim to Henry Ford
- Alameda, Henry Ford to PCH
- Alameda PCH to 405
- Alameda 405 to del Amo
- Alameda, del Amo to South Santa Fe Avenue
- Alameda, South Santa Fe Avenue to SR-91
- I-110, "C" Street Interchange to Anaheim
- I-110, Anaheim to PCH
- 1-110, PCH to Sepulveda
- I-110, Sepulveda to Carson
- I-110, Carson to Del Amo
- I-110, Del Amo to 405
- I-110, 405 to SR-91
- I-710, Anaheim to PCH
- I-710, PCH to Willow
- I-710, Willow to 405
- I-710, 405 to Del Amo
- I-710, Del Amo to Long Beach Blvd Interchange
- I-710, Long Beach Boulevard to SR-91
- PCH, I-110 to Alameda
- PCH, Alameda to SR-103
- PCH, SR-103 to I-710
- Sepulveda, I-110 to Avalon
- Sepulveda, Avalon to Alameda
- Sepulveda, Alameda to ICTF
- Sepulveda, ICTF to SR-103
- Del Amo, I-110 to Wilmington
- Del Amo, Wilmington to Alameda
- Del Amo, Alameda to I-710
- 223rd Street, I-110 to Avalon
- 223rd Street, Avalon to Wilmington
- 223rd Street, Wilmington to Alameda
- West Wardlow from Alameda to I-710

4.4.6.4 Results

The MSAT Tool and project-specific traffic data were used to estimate the MSAT emissions presented in Table 25. As shown in Table 25, the MSAT emissions are predicted to decrease over time, even though the traffic volumes and percentage of diesel trucks are expected to increase over time. The decrease in MSAT emissions for the alternatives analyzed is consistent with EPA projections that MSAT emissions will decrease over the next 15 years. However, the MSAT analysis shows a slight increase in diesel particulate matter emissions in the year 2030 when compared to the year 2015. This increase is due to aging of the truck fleet because it was assumed the Port trucks would have model year 2007 or newer engines. In the year 2015, a model year 2007 engine would only be 8 years old. However, by the year 2030, trucks with model year 2007 engines would have aged to 23 years old. The aging of the truck fleet results in the higher emission factors in 2030 compared to 2015.

In general, there would be minor differences in MSAT emissions between the alternatives for each year analyzed. However, MSAT emissions for the No Build alternative, Alternative 1, and Alternative 2 in the future years would be much lower when compared to the existing condition (2003). The MSAT emissions in years 2015 and 2030 would be less that or the same for Alternatives 1 and 2 when compared to the No-Build alternative. In summary, the MSAT emissions, excluding diesel particulate matter, would be predicted to decrease with time.

MSAT emissions were estimated by road segment and the summary of the MSAT emissions by segment are provided in Appendix N. For both Alternative 1 and Alternative 2, the MSAT emissions for each roadway segment evaluated would be less than the existing condition. The following paragraphs summarize the comparison for the years 2015 and 2030.

For the year 2015, comparing Alternative 1 to the No Build Alternative, the road segment Alameda PCH to 405 would result in the highest incremental increase in DPM emissions. For this same scenario, the highest emissions of the other five MSATs would be along the I-110 and I-710 segments. However, DPM emissions would be expected to decrease along the I-110 segments and along I-710 segments. Alternatively, for the year 2015, comparing Alternative 2 to the No Build Alternative, the road segments along SR-103 would result in the highest incremental increase in DPM emissions for Alternative 2. Similar to Alternative 1, the highest emissions of the other five MSATs for Alternative 2 would be along the I-110 segments and I-710 segments while DPM emissions would be expected to decrease along the I-110 segments and along the I-710 segments.

For the year 2030 comparing Alternative 1 to the No Build Alternative, the road segments SR-47 Extension, HF Ramps to Alameda and Alameda PCH to 405 would result in the highest incremental increase in DPM emissions. For this same scenario, the emissions of the other five MSATs for Build Alternative 1 would be expected to be similar to the No Build Alternative. Alternatively, for the year 2030, comparing Alternative 2 to the No Build Alternative, the road segments along SR-103 and Alameda PCH to 405 would result in the highest incremental increase in DPM emissions. Similar to Alternative 1, the highest emissions of the other five MSATs for Alternative 2 would be similar to the No Build Alternative.

TABLE 25
MSAT Emissions Summary

		Emissions (lbs/day)					
Year	**Scenario**	**Diesel PM**	**Benzene**	**1,3-Butadiene**	**Acetaldehyde**	**Acrolein**	**Formaldehyde**
2003	**No Build**	828	70	16	14	4	53
2015	**No Build**	95	12	3	2	1	10
	Alternative 1	94	12	3	2	1	10
	Alternative 2	91	12	3	2	1	10
2030	**No Build**	128	3	1	0.4	0.2	4
	Alternative 1	127	3	1	0.4	0.2	4
	Alternative 2	128	3	1	0.4	0.2	4

4.4.6.5 Limitations of MSAT Analysis

The following discussion regarding the limitations of the MSAT analysis is prototype language taken from the Interim Guidance, Appendix C.

4.4.6.5.1 Unavailable Information for Project-Specific MSAT Impact Analysis

This MSAT analysis includes a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with the project alternatives. Due to these limitations, the following discussion is included in accordance with Council on Environmental Quality (CEQ) regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information.

4.4.6.5.2 Information that Is Unavailable or Incomplete

Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling to estimate ambient concentrations resulting from the estimated emissions, exposure modeling to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

- Emissions: The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables that determine emissions of MSATs in the context of highway projects. While MOBILE 6.2 is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE 6.2 is a trip-based model--emission factors are projected based on a typical trip of 7.5 miles, and on average speeds for this typical trip. This means that MOBILE 6.2 does not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE 6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects, and cannot adequately capture emissions effects of smaller projects. For PM the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Also, the emissions rates used in MOBILE 6.2 for both particulate matter and MSATs are based on a limited number of tests of mostly older-technology vehicles. Lastly, in its discussions of PM under the conformity rule, EPA has identified problems with MOBILE6.2 as an obstacle to quantitative analysis.

  In California, the emission factor model EMFAC2007 is used to calculate motor vehicle emission rates. The CARB developed EMFAC as an emissions inventory model for motor vehicles. EMFAC2007 incorporates data such as temperature, humidity, vehicle age, and vehicle mix. Similar to MOBILE6.2, EMFAC2007 is a trip-based model that estimates emission rates based on average speeds and typical trips. This also means that EMFAC2007 would not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. For an MSAT analysis, EMFAC2007 is limited because it only provides emission factors for diesel PM and does not provide emission factors for the five other priority MSATs.

These deficiencies compromise the capability of MOBILE 6.2 and EMFAC2007 to estimate MSAT emissions. MOBILE 6.2 and EMFAC2007 are adequate tools for projecting emissions trends, and performing relative analyses between alternatives for very large projects, but these models are not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations.

- Dispersion: The tools to predict how MSATs disperse are also limited. The current EPA regulatory models, CALINE3 and CAL3QHC, were developed and validated more than a decade ago for the purpose of predicting episodic concentrations of carbon monoxide to determine compliance with the NAAQS. In California, the dispersion model CALINE4 is used to predict concentrations of carbon monoxide. CALINE4 was developed by Caltrans and can predict pollutant concentrations within 500 meters (1,640 feet) of a roadway. CALINE4 can evaluate CO and PM dispersion and incorporates the Discrete Parcel Method to estimate NO_2 concentrations. The performance of dispersion models is more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area. This limitation makes it difficult to predict accurate exposure patterns at specific times at specific highway project locations across an urban area to assess potential health risk. The NCHRP is conducting research on best practices in applying models and other technical methods in the analysis of MSATs. This work also will focus on identifying appropriate methods of documenting and communicating MSAT impacts in the NEPA process and to the general public. Along with these general limitations of dispersion models, FHWA is also faced with a lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.

- Exposure Levels and Health Effects: Finally, even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude us from reaching meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. There are also considerable uncertainties associated with existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis.

4.4.6.5.3 Summary of Existing Credible Scientific Evidence Relevant to Evaluating the Impacts of MSATs

Research into the health impacts of MSATs is ongoing. For different emission types, there are a variety of studies showing that some emission types either are statistically associated with adverse health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses.

Exposure to toxics has been a focus of a number of EPA efforts. Most notably, the agency conducted the National Air Toxics Assessment (NATA) in 1996 to evaluate modeled estimates of human exposure applicable to the county level. While not intended for use as a measure of or benchmark for local exposure, the modeled estimates in the NATA database best illustrate the levels of various toxics when aggregated to a national or state level.

The EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The EPA Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS database is located at http://www.epa.gov/iris. The following toxicity information for the six prioritized MSATs was taken from the IRIS database Weight of Evidence Characterization summaries. This information is taken verbatim from the EPA IRIS database and represents the agency's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures.

- Benzene is characterized as a known human carcinogen.
- The potential carcinogenicity of acrolein cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.
- Formaldehyde is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.
- 1,3-butadiene is characterized as carcinogenic to humans by inhalation.
- Acetaldehyde is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.
- Diesel exhaust is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of DPM and diesel exhaust organic gases.
- Diesel exhaust also represents chronic respiratory effects, possibly the primary noncancer hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms such as cough, phlegm, and chronic bronchitis. Exposure relationships have not been developed from these studies.

There have been other studies that address MSAT health impacts in proximity to roadways. The Health Effects Institute, a non-profit organization funded by EPA, FHWA, and industry, has undertaken a major series of studies to research near-roadway MSAT hot spots, the health implications of the entire mix of mobile source pollutants, and other topics. The final summary of the series is not expected for several years.

Some recent studies have reported that proximity to roadways is related to adverse health outcomes -- particularly respiratory problems. Much of this research is not specific to MSATs, instead surveying the full spectrum of both criteria and other pollutants. The FHWA cannot evaluate the validity of these studies, but more importantly, they do not provide information that would be useful to alleviate the uncertainties listed above and enable us to perform a more comprehensive evaluation of the health impacts specific to this project.

4.4.6.5.4 Relevance of Unavailable or Incomplete Information to Evaluating Reasonably Foreseeable Significant Adverse Impacts on the Environment, and Evaluation of Impacts Based upon Theoretical Approaches or Research Methods Generally Accepted in the Scientific Community

Because of the uncertainties outlined above, a quantitative assessment of the effects of air toxic emissions impacts on human health cannot be made at the project level. While available tools do allow us to reasonably predict relative emissions changes between alternatives for larger projects, the amount of MSAT emissions from each of the proposed project alternatives and MSAT concentrations or exposures created by each of the project alternatives cannot be predicted with enough accuracy to be useful in estimating health impacts. (As noted above, the current emissions model is not capable of serving as a meaningful emissions analysis tool for smaller projects.) Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have "significant adverse impacts on the human environment."

This MSAT analysis has provided a quantitative analysis of MSAT emissions relative to the various alternatives, and has acknowledged that, for the analysis years 2015 and 2030, total MSAT emissions from Alternatives 1 and 2 may result in slightly higher MSAT emissions in certain locations when compared to the No-Build alternative. However, the concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated.

4.4.7 Health Risk Assessment

To address community requests for an HRA, a methodology has been developed to assess the potential health risks associated with the proposed project. The methodology is modeled after established protocols for stationary sources but recognizes the spatial differences of transportation projects. Similar to an HRA for a stationary source, risk was projected over a 70-year period and assumptions were made about future conditions. The HRA conservatively estimated project impacts because it assumed significant growth in traffic (based on port projections) and traffic-related emissions but does not account for the effect of probable future regulations that may significantly reduce vehicle emissions. For example, only existing and currently proposed regulations were included in the vehicle emission calculations. However, it is likely that motor vehicle and fuel standards would continue to become more stringent over the next 70 years. Accordingly, there are concerns that the HRA methodology when applied to transportation projects may be too conservative. The details of the methodology and results of the HRA are included in Appendix Q.

Two emission scenarios were included in the HRA, one based on 2015 emissions and the other one based on 70-year average emissions (year 2003 through 2072). Both scenarios evaluated the risks over a 70-year period for several categories of exposed receptors (residential, commercial/industrial workers, recreational workers and users, and school workers and students). The 2015 emission scenario was used for significance evaluation as well as the basis for mitigation.

The preferred emission scenario for the HRA was the 2015 scenario. This scenario address the uncertainties related to future years' emissions with the 70-year average analysis. The 2015 emission scenario uses emissions in 2015 as representative of project emissions over the 70-year period. This scenario uses projected traffic levels in 2015 and assumes that in 2015, the Ports Clean Truck Program and the CARB on-road heavy-duty truck regulations are in place. The emissions in 2015 were assumed to be constant over a 70-year period and the resulting risk for 2105 was projected over 70 years to estimate lifetime cancer risk. In other words, emissions associated with increases in traffic were assumed to be offset by future regulations so that future emissions would be no worse than what would occur in 2015. As a result of CARB and EPA regulations, vehicle emissions have been steadily decreasing despite significant increases in traffic, therefore, this approach was considered conservative.

Under the 2015 emission scenario, predicted incremental cancer risks for commercial/ industrial workers, recreational workers and users, and school workers and students for Alternative 1 would be below the significance threshold of 10 in one million. For Alternatives 1 and 2, the maximum incremental residential cancer risk along the corridor would be less than 11 and less than 17 in a million, respectively. Acute and chronic hazard indexes would be below the significance threshold of 1 for all receptors. The 2015 emissions scenario presents a more realistic and less uncertain risk estimate for the following reasons:

- It relies on reasonably foreseeable traffic estimates (there is higher confidence in near-term projections than projections in the 2020-2070 planning horizon).
- Only regulations currently mandated by law or currently proposed as regulations were included in the analysis (e.g., Ports' Clean Truck Program and CARB's On-Road Heavy Duty Diesel Vehicles Regulation, which is set for adoption by the Board in December of 2008).
- It assumes that regulatory efforts to reduce emissions from vehicles would not cease, but would continue as they have for several decades, and that these measures would, at a minimum, maintain emissions at no higher than 2015 levels.

Under the 2015 emission scenario, there would be residential receptors predicted to have cancer risk that would exceed that significance threshold of 10 in one million. Therefore, feasible mitigation would be required. To mitigate localized health impacts, a heating, ventilating, and air conditioning (HVAC) retrofit program was proposed for residences with potential incremental cancer risks greater than 10 in one million. The total number of homes to be mitigated under Alternative 1 would be less than 30 and less than 150 under Alternative 2.

The 70-year average emissions scenario evaluated cancer risks starting in the year 2003 and extending to 2072. This analysis assumes that the San Pedro Ports Clean Truck program is in place by 2015, the CARB "On-Road Heavy Duty Diesel Vehicle Regulation" is approved, the

CARB low carbon fuels regulations are implemented by 2020, and no other additional regulations are promulgated between 2020 and 2072. The results of the 70-year average emissions scenario indicate that Alternative 1 would result in substantial regional benefits that reduce health risk from exposure to diesel exhaust in the majority of the study area. For localized impacts under Alternative 1, incremental cancer risks for commercial/industrial workers, recreational workers and users, and school workers and students would be below the significance threshold of 10 in one million. The increase in cancer risk for the maximum exposed residential receptors was calculated to be less than 14 in one million for Alternative 1 and less than 20 in one million for Alternative 2. Alternative 2 also predicts a significant cancer risk for recreational workers and users and school workers. Acute and chronic hazard indexes of both Alternative 1 and Alternative 2 would be below the significance threshold of 1 for all receptors.

4.5 Cumulative Impacts

4.5.1 Other Major Projects in the Project Area

Numerous other projects are proposed or ongoing within the area of the project alternatives. These existing and potential future projects are located within the Port of Long Beach, Port of Los Angeles, City of Long Beach, City of Carson, and in the San Pedro and Wilmington Districts of the City of Los Angeles. These existing and potential future projects include, but are not limited to, other bridge and roadway developments, container terminals, schools, hotels, commercial and residential developments, and manufacturing and warehouse facilities. Tables 26 through 28 list the major projects in the project area.

4.5.2 Construction Impacts

Construction of each of the build alternatives by itself would generate emissions that exceed the SCAQMD thresholds, creating a temporary significant impact. Therefore, the combined impacts of the project construction with other concurrent construction projects would be expected to be cumulatively significant during the project construction duration.

4.5.3 Direct Operational Impacts

The impact of the proposed project and alternatives on localized CO and PM_{10} levels near intersections was determined to be less than significant. The operational impacts of the project alternatives were evaluated based on traffic forecasts that already accounted for cumulative growth. Therefore, cumulative impacts from operations of the proposed project or alternatives together with other projects would be expected to be less than significant.

4.5.4 Indirect Operational Impacts

The project alternatives would cause temporary significant emissions of NO_X due to marine vessel detours during project operations. Therefore, the combined impacts from the proposed action together with other nearby projects would be cumulatively significant for NO_X emissions. Emissions of CO, ROG, and PM_{10} due to marine vessel detours would be minimal and would be unlikely to contribute significantly to the cumulative impacts.

TABLE 26
Proposed Port of Long Beach and Port of Los Angeles Area Development Projects

Port Area Projects		
Project	**Description/Status**	**Estimated Completion Date**
Port of Los Angeles		
Pier 400 Container Terminal and Transportation Corridor Project	Element of the 2020 Deep Draft Navigation Improvements Plan: dredging, land filling, and marine terminal construction. The entire Pier 400 site is on a recently constructed landfill in the Port of Los Angeles Outer Harbor. The project is a two-phase development of Pier 400 into a 345-acre container terminal with rail, highway, and utility access. Phase I consists of construction of rail and highway access and the first 174 acres of a marine container terminal, including buildings, a wharf, and an intermodal rail yard. Phase II consists of construction of the remaining 171 acres into a container terminal. Landfill construction was recently completed. The EIR certified for the project identified significant air, transportation, noise, and vibration impacts.	Approved project. Stage I construction completed. Stage II construction underway.
Berths 118-131 Marine Terminal West Basin	Element of the West Basin Transportation Improvement Projects. Reconfiguration of wharves and backlands. Joint operations of the Yang Ming and China Shipping terminals.	EIR being completed.
Berths 136-150 Marine Terminal West Basin	Element of the West Basin Transportation Improvement Projects; Reconfiguration of wharves and backlands. Expansion and redevelopment of the TraPac Terminal.	Notice of Interest/Notice of Preparation (NOI/ NOP) released in October 2004. EIR being completed.
Wilmington Parkway	The realignment and widening of Harry S. Bridges Boulevard, acquisition/condemnation of properties, expansion of container terminal backlands, construction of a berm and associated recreational facilities.	EIS/SEIR being completed. Harry Bridges will no longer be realigned except directly adjacent to the C Street interchange.
Evergreen Expansion, Terminal Island, POLA	Expansion of the Evergreen Marine Terminal. Lease boundary changes, gate improvements, wharf modifications, cranes, and new buildings.	EIR to be prepared. NOP for new EIR release possible in January 2004.
Waterfront Promenade, San Pedro	Construction of a waterfront promenade or pedestrian walkway along the western shore of the Main Channel south of the Vincent Thomas Bridge.	Design and planning initiated. Environmental work about to proceed.
Waterfront Gateway	This is part of the San Pedro Waterfront Promenade Project. Development initiated for waterfront promenade between Vincent Thomas Bridge and Fire Station 112.	Approved project. Phase I construction underway.
Channel Deepening Project	Dredging and sediment disposal. This project would deepen the Port of Los Angeles' Main Channel to a maximum 55 ft. MLLW (mean lower low water) (lesser depths are considered as project alternatives) by removing between 3.9 million and 8.5 millions cubic yards of sediments. The sediments would be disposed of at several sites.	Approved project; Construction underway. EIR being completed.

TABLE 26
Proposed Port of Long Beach and Port of Los Angeles Area Development Projects

Port Area Projects		
Project	**Description/Status**	**Estimated Completion Date**
Cabrillo Way Marina, Phase II, San Pedro	Redevelop of the old marinas in the Watchorn Basin and development of the backland areas for a variety of commercial and recreational uses.	EIR certified. December 02, 2003
Berths 97-109 Container Terminal Project, West Basin	Development and operation of a container terminal at Berths 97-109.	EIR being completed.
Crescent Warehouse Company Relocation	Relocate Crescent Warehouse Company from Port Warehouses 1, 6, 9, and 10 to an area of southeast Wilmington along Henry Ford and East I Street (tentative).	EIR to be prepared.
Berths 171-181, Pasha Marine Terminal Improvements EIR	Redevelopment of existing facilities at Berths 171-181 as an omni (multi-use) facility.	Draft EIR being prepared. Anticipated completion in 2005.
Pier 400, Pacific Energy Systems	Proposal to construct Crude Oil Receiving Facility on Pier 400 with tanks on Terminal Island, with pipelines between berth, tanks, and pipeline system.	SEIS/EIR under preparation. NOI/NOP released in June 2004.
Berth 206-209 Interim Container Terminal Reuse Project EIR	Proposal to allow interim reuse of former Matson Terminal. Change in tenant; no substantial change in operations.	Final EIR released November 2005.
Ultramar, Valero Lease Renewal	Lease renewal EIR for liquid bulk (petroleum) terminal.	New Project EIR to be prepared.
Conoco-Phillips Marine Oil Terminal	Lease renewal EIR for marine oil terminal.	New Project EIR to be prepared.
SSA Outer Harbor Fruit Facility Relocation	Proposal to relocate the existing fruit import facility at 22nd St. and Miner St. to Berth 153.	EIR to be prepared.
Charter High School and Port Police Headquarters, San Pedro	Proposal to develop a charter high school "Port of Los Angeles High School of International Business and Maritime Studies." Development of a new headquarters building for the Port Police.	Charter high school opened - March 2006; Police Headquarters construction out for bids.
Pacific Corridor Redevelopment Project, San Pedro	Development of commercial/retail, manufacturing, and residential components.	Studies completed.
Cabrillo Marine Aquarium Expansion, San Pedro	Expansion of existing Cabrillo Marine Aquarium.	Construction underway.
East Wilmington Greenbelt Community Center	Construction of a new 10,000 square-foot community building, a 25-space parking lot, and landscaped areas.	Construction completed.
Fishing Reef, San Pedro Breakwater	Development of an artificial reef site south of the San Pedro Breakwater. Provides opportunity for suitable reuse of clean construction materials, and to create bottom topography to promote local sport fishing.	Negative Declaration adopted and approved.

TABLE 26
Proposed Port of Long Beach and Port of Los Angeles Area Development Projects

Port Area Projects		
Project	**Description/Status**	**Estimated Completion Date**
Southern California International Gateway [(1)]	Increased use of rail and increased near-dock rail facilities for movement of both existing and future containerized cargo to help address the need for increased near-dock facilities and to provide an efficient connection to the Alameda Corridor.	Notice of Preparation released September 2005.
LAUSD		
15th Street Elementary School, San Pedro	LAUSD's construction of additional classrooms at 15th Street Elementary School. Construction scheduled to begin by late 2003.	Construction completed.
Banning Elementary School	Banning Elementary School #1 is a two-building elementary school consisting of one two-story classroom building with subterranean parking garage and a one-story multipurpose building. Located in Wilmington, the school will provide over 2 acres of playground and green space.	Construction completed.
Port of Long Beach		
Piers D, E, F Terminal Redevelopment	Expansion of existing marine container terminal. The Piers D, E, and F Development project will be located in the Middle Harbor area of the Port of Long Beach. The project will involve consolidation of two existing container terminals into one 336-acre terminal. Construction will include approximately 53 acres of landfill, dredging, wharf construction; construction of an intermodal rail yard; and reconstruction of terminal operations buildings. The EIR prepared for this project identified significant air, transportation, biological, and water quality impacts.	EIR prepared.
Piers G & J Terminal Redevelopment Project	Redevelopment of two existing marine container terminals into one terminal. The Piers G and J redevelopment project is in the Southeast Harbor Planning District area of the Port of Long Beach. The project will develop a marine terminal of up to 315 acres by consolidating two existing terminals on Piers G and J and several surrounding parcels. Construction will occur in four phases; it will include approximately 53 acres of landfills, dredging, concrete wharves, rock dikes, and road and railway improvements. The EIR prepared for this project identified potentially significant impacts to air quality and geologic resources.	Construction underway.
Pier A West Expansion Project	Expansion of an existing marine container terminal. The Pier A expansion project would be located north of Cerritos Channel on both sides of the Terminal Island Freeway. The project consists of the development of approximately 90 acres of oil production land, including remediation of soil and groundwater contamination, relocation of oil wells, filling, paving, and utilities. Additionally, an underpass linking the existing Pier A site to the expansion site would need to be constructed under the Terminal Island Freeway, just north of the Schuyler Heim Bridge.	Conceptual project. No environmental documentation has been prepared by the Port of Long Beach.

TABLE 26
Proposed Port of Long Beach and Port of Los Angeles Area Development Projects

Port Area Projects		
Project	**Description/Status**	**Estimated Completion Date**
Pier T Hanjin Terminal, Phase II	Development of a container terminal, liquid bulk facility and satellite launch facility. The Port of Long Beach is redeveloping the former Long Beach Naval Complex on Terminal Island. The project consists of constructing a 300-acre marine container terminal, with a wharf, terminal operations buildings, utilities, and rail yard. Construction includes 22 acres of landfill. The SEIS/EIR certified for this project identified significant air, transportation, public health and safety, cultural resources, biological resources, and vibration impacts.	Approved project. Phase complete. Phase II under construction.
Pier S Marine Terminal	Development of a 150-acre container terminal on Terminal Island. The Pier S site encompasses approximately 170 acres of former oil production land, which is currently undergoing remedial action. Following remediation and stabilization, the site will be brought up to grade and paved. The project calls for existing riprap dike along Cerritos Channel to be realigned and a concrete, pile-supported wharf to be built. Additionally, terminal buildings, utilities, and a rail yard will be constructed. The EIR certified for the project identified significant air and transportation impacts.	Approved project. Construction underway.
Pier J South Terminal	Development of a 385-acre marine terminal. Dredge and fill activities required to consolidate two existing terminals.	Final SEIS/EIR to be released for public review in October 2006.
Pier T, Long Beach LNG Terminal	Construction of a 25-acre liquefied natural gas (LNG) import terminal facility, including pipeline and wharf construction on a portion of Pier T on Terminal Island.	EIR/EIS being prepared. Construction to begin in October 2004.
Gerald Desmond Bridge Replacement Project (1)	Replacement of existing Gerald Desmond Bridge over the Port of Long Beach Back Channel.	EIR being prepared.
Chemoil Marine Terminal	Five acres of petroleum products and bunker fuel storage.	
California United Terminals Interim Rail Yard	Interim rail yard project in Middle Harbor Area.	Environmental document in preparation
Security Command and Control Center	Construction new 5-story security center with rooftop helipad.	Environmental document in preparation.
Harbor Administration Building Replacement		

TABLE 26
Proposed Port of Long Beach and Port of Los Angeles Area Development Projects

Port Area Projects		
Project	**Description/Status**	**Estimated Completion Date**
RMS Queen Mary Seaport, City/POLB	Construction of a variety of retail and entertainment uses and parking. The Queen Mary Seaport project is a 54-acre, phased development adjacent to and incorporating the Queen Mary in the Port. Phase I includes onboard upgrades to the Queen Mary and surface parking improvements. Phase II includes construction of retail and entertainment-based uses, a parking structure, a hotel, and new infrastructure. Phase III includes events, park improvements, a major attraction, and additional retail and restaurant uses.	Approved project; Construction underway.
Pier B Intermodal Rail Yard\Expansion	Expand Pier B St intermodal rail yard to facilitate additional rail shipments. Also realign and widen Pier B St.	
City of Long Beach Projects		
Marriott Hotel Project	Development of a 430-room hotel on the southeast corner of Ocean Boulevard and the Promenade.	Approved project. Construction underway.
D'Orsay Hotel Project	Development of a 162-room boutique-style hotel on the northwest corner of Broadway and the Promenade.	Approved project. Construction underway.
Long Beach Plaza Mall Redevelopment	Development of commercial and residential space at the former Long Beach Plaza Mall, downtown between 3rd and 6th Streets and between Long Beach Boulevard and Pacific Avenue. Redevelop the former mall area and two blocks of vacant land east of Long Beach Boulevard with approximately 450,000 square feet of commercial space and up to 200 residential units. The EIR prepared for this project identified significant air quality impacts.	Approved project. Construction underway.
The Pike at Rainbow Harbor	Development of residential units and an office building or hotel. Project site is south of Ocean Boulevard on the site of the former Pike Amusement Park between Pine and Magnolia Avenues. Project will include approximately 770 residential units, a 500-room hotel, and 25,000 square feet of commercial space. The EIR prepared for this project identified significant air quality, cultural resources, noise, public service, and transportation impacts.	Approved project. Construction underway.
Queensway Bay Master Plan	Construction of Long Beach Aquarium, new urban harbor, office building, and entertainment complex. This project, designed to create a major waterfront attraction in downtown Long Beach, includes a recreational harbor, 150,000-square-foot aquarium, 125,000-square-foot entertainment complex, 59,000 square feet of restaurant/retail space, an 800-room hotel, 95,000 square feet of commercial/office space, and 487 boat slips in and around Queensway Bay. The recreational harbor and aquarium have been completed. The EIR certified for this project identified significant transportation impacts.	Approved project. Construction underway.

[1] These projects, while listed here, were not included in the cumulative analysis, as they were not reasonably foreseeable at the time of issuance of the NOP for the project alternatives. Exclusion of these projects also represents a worst-case scenario with respect to surface traffic.

TABLE 27
Major Transportation Capacity-Altering Projects
NOT Incorporated in model for background growth, but listed for cumulative impact analysis:

Los Angeles Metropolitan Transportation Authority Short-Range Transportation Plan for Los Angeles County		
Project	**Description/Status**	**Estimated Completion Date**
Avalon Blvd at I-405 Freeway [1]	Reconfigure interchange to meet future traffic loads; widen northbound off-ramp at Avalon	2005
Artesia on-ramp at I-405	Modify the northbound on-ramp at Artesia by adding a third lane	
Wilmington at I-405 [1]	Widen the southbound off-ramp at Wilmington to two lanes and widen the intersection at off-ramp and Wilmington	2005
Avalon Blvd at I-405 [1]	Modify the southbound on-ramp at Avalon Blvd. at I-405	2005
Downtown/Shoreline Drive Adaptive Traffic Management System	Deployment of ITS elements in the Long Beach downtown area to provide an adaptive traffic management system to respond to special generator traffic	TBD

[1] Project also appears in the 2008 SCAG RTP.

TABLE 28
Projects Used for SCAG Projections
Incorporated in model for background growth

2004 SCAG Regional Transportation Plan		
Project	**Description/Status**	**Estimated Completion Date**
Baseline Projects		
Water Street/Figueroa Street/Fries Avenue	New four-lane roadway	
Mormon Island Access Grade Separation	Grade separation at the railroad crossing	
Plan Projects		
Mormon Island Access Grade Separation	Harry Bridges Boulevard to Fries Avenue, provide one- or two-lane grade separation	
I-110 Freeway HOV	High-occupancy vehicle (HOV) lanes from I-405 to SR-91	
Other Unconstrained Projects		
SR-91/I-110 Freeway	From east to south and east to north, provide HOV connectors	Unknown
I-710 Freeway	At Wardlow Road, reconstruct connector bridge	Unknown

5. Mitigation Measures

5.1 Project Construction

As shown in Section 4, construction emissions of CO, ROG, SO_X, NO_X, $PM_{2.5}$, and PM_{10} would exceed SCAQMD significance thresholds. The primary contributors of CO, ROG, NO_X, and SO_X emissions would be onsite construction equipment and vehicle trips to and from the construction site. The primary source of PM_{10} and $PM_{2.5}$ emissions would be fugitive dust associated with earth moving, stockpiles, demolition activities, and vehicle travels on unpaved roads at the project site. The construction emission calculations shown in previous sections have taken the following control measures into account:

- Watering construction sites at least three times per day and suspending excavation and grading operations when wind speeds exceed 25 mph
- Use of tarps and maintaining freeboard on delivery/supply trucks

The project would comply with control measures specified in SCAQMD Rule 403, Table 1, and Rule 1186. Construction activities will also be subject to compliance with Caltrans Standard Construction Specifications. The following sections describe additional mitigation measures that would further reduce air quality impacts during project construction. After mitigation, impacts would be expected to remain temporarily significant due to the scale of the construction project.

5.1.1 Mitigation Measures for Fugitive $PM_{10}/PM_{2.5}$

- Apply nontoxic soil stabilizers to all inactive construction areas (previously graded areas inactive for 10 days). Nontoxic soil stabilizers can reduce $PM_{10}/PM_{2.5}$ emissions from these areas by 30 to 65 percent.
- Replace ground cover in disturbed areas as quickly as possible. A reduction of 15 to 49 percent in $PM_{10}/PM_{2.5}$ emissions for disturbed areas could be achieved.
- Reduce traffic speed on all unpaved roads to 15 mph or less. $PM_{10}/PM_{2.5}$ emissions from travel on unpaved roads can be reduced by 40 to 70 percent by managing vehicle speeds.
- SCAQMD Rule 403 Requirements (Amended June 3, 2005) that apply to the project are listed in Table 29:

TABLE 29
Best Available Control Measures
(Applicable to All Construction Activity Sources)

Source Category	Control Measure	Guidance
Backfilling	01-1 Stabilize backfill material when not actively handling; 01-2 Stabilize backfill material during handling; and 01-3 Stabilize soil at completion of activity.	✓ Mix backfill soil with water prior to moving ✓ Dedicate water truck or high capacity hose to backfilling equipment ✓ Empty loader bucket slowly so that no dust plumes are generated ✓ Minimize drop height from loader bucket
Clearing and grubbing	02-1 Maintain stability of soil through pre-watering of site prior to clearing and grubbing; 02-2 Stabilize soil during clearing and grubbing activities; and 02-3 Stabilize soil immediately after clearing and grubbing activities	✓ Maintain live perennial vegetation where possible ✓ Apply water in sufficient quantity to prevent generation of dust plumes
Clearing forms	03-1 Use water spray to clear forms; 03-2 Use sweeping and water spray to clear forms; or 03-3 Use vacuum system to clear forms.	✓ Use of high pressure air to clear forms may cause exceedance of Rule requirements
Crushing	04-1 Stabilize surface soils prior to operation of support equipment; and 04-2 Stabilize material after crushing.	✓ Follow permit conditions for crushing equipment ✓ Pre-water material prior to loading into crusher ✓ Monitor crusher emissions opacity ✓ Apply water to crushed material to prevent dust plumes
Cut and fill	05-1 Pre-water soils prior to cut and fill activities; and 05-2 Stabilize soil during and after cut and fill activities	✓ For large sites, pre-water with sprinklers or water trucks and allow time for penetration ✓ Use water trucks/pulls to water soils to depth of cut prior to subsequent cuts
Demolition – mechanical/manual	06-1 Stabilize wind erodible surfaces to reduce dust; 06-2 Stabilize surface soil where support equipment and vehicles will operate; 06-3 Stabilize loose soil and demolition debris; and 06-4 Comply with AQMD Rule 1403.	✓ Apply water in sufficient quantities to prevent the generation of visible dust plumes

TABLE 29
Best Available Control Measures
(Applicable to All Construction Activity Sources)

Source Category	Control Measure	Guidance
Disturbed soil	07-1 Stabilize disturbed soil throughout the construction site; and 07-2 Stabilize disturbed soil between structures	✓ Limit vehicular traffic and disturbances on soils where possible ✓ If interior block walls are planned, install as early as possible ✓ Apply water or a stabilizing agent in sufficient quantities to prevent the generation of visible dust plumes
Earth-moving activities	08-1 Pre-apply water to depth of proposed cuts; 08-2 Re-apply water as necessary to maintain soils in a damp condition and to ensure that visible emissions do not exceed 100 feet in any direction; and 08-3 Stabilize soils once earth-moving activities are complete.	✓ Grade each project phase separately, timed to coincide with construction phase ✓ Upwind fencing can prevent material movement on site ✓ Apply water or a stabilizing agent in sufficient quantities to prevent the generation of visible dust plumes
Importing/exporting of bulk materials	09-1 Stabilize material while loading to reduce fugitive dust emissions; 09-2 Maintain at least 6 inches of freeboard on haul vehicles; 09-3 Stabilize material while transporting to reduce fugitive dust emissions; 09-4 Stabilize material while unloading to reduce fugitive dust emissions; and 09-5 Comply with Vehicle Code Section 23114.	✓ Use tarps or other suitable enclosures on haul trucks ✓ Check belly-dump truck seals regularly and remove any trapped rocks to prevent spillage ✓ Comply with track-out prevention/mitigation requirements ✓ Provide water while loading and unloading to reduce visible dust plumes
Landscaping	10-1 Stabilize soils, materials, slopes	✓ Apply water to materials to stabilize ✓ Maintain materials in a crusted condition ✓ Maintain effective cover over materials ✓ Stabilize sloping surfaces using soil binders until vegetation or ground cover can effectively stabilize the slopes ✓ Hydroseed prior to rain season
Road shoulder maintenance	11-1 Apply water to unpaved shoulders prior to clearing; and 11-2 Apply chemical dust suppressants and/or washed gravel to maintain a stabilized surface after completing road shoulder maintenance.	✓ Installation of curbing and/or paving of road shoulders can reduce recurring maintenance costs ✓ Use of chemical dust suppressants can inhibit vegetation growth and reduce future road shoulder maintenance costs

TABLE 29
Best Available Control Measures
(Applicable to All Construction Activity Sources)

Source Category	Control Measure	Guidance
Screening	12-1 Pre-water material prior to screening; 12-2 Limit fugitive dust emissions to opacity and plume length standards; and 12-3 Stabilize material immediately after screening.	✓ Dedicate water truck or high capacity hose to screening operation ✓ Drop material through the screen slowly and minimize drop height ✓ Install wind barrier with a porosity of no more than 50 percent upwind of screen to the height of the drop point
Staging areas	13-1 Stabilize staging areas during use; and 13-2 Stabilize staging area soils at project completion.	✓ Limit size of staging area ✓ Limit vehicle speeds to 15 mph ✓ Limit number and size of staging area entrances/exists
Stockpiles/ bulk material handling	14-1 Stabilize stockpiled materials. 14-2 Stockpiles within 100 yards of offsite occupied buildings must not be greater than 8 feet in height; or must have a road bladed to the top to allow water truck access; or must have an operational water irrigation system that is capable of complete stockpile coverage.	✓ Add or remove material from the downwind portion of the storage pile ✓ Maintain storage piles to avoid steep sides or faces
Traffic areas for construction activities	15-1 Stabilize all off-road traffic and parking areas; 15-2 Stabilize all haul routes; and 15-3 Direct construction traffic over established haul routes.	✓ Apply gravel/paving to all haul routes as soon as possible to all future roadway areas ✓ Barriers can be used to ensure vehicles are only used on established parking areas/haul routes
Trenching	16-1 Stabilize surface soils where trencher or excavator and support equipment will operate; and 16-2 Stabilize soils at the completion of trenching activities.	✓ Pre-watering of soils prior to trenching is an effective preventive measure. For deep trenching activities, pre-trench to 18 inches; soak soils via the pre-trench and resume trenching ✓ Washing mud and soils from equipment at the conclusion of trenching activities can prevent crusting and drying of soil on equipment

TABLE 29
Best Available Control Measures
(Applicable to All Construction Activity Sources)

Source Category	Control Measure	Guidance
Truck loading	17-1 Pre-water material prior to loading; and 17-2 Ensure that freeboard exceeds six inches (CVC 23114)	✓ Empty loader bucket such that no visible dust plumes are created ✓ Ensure that the loader bucket is close to the truck to minimize drop height while loading
Turf overseeding	18-1 Apply sufficient water immediately prior to conducting turf vacuuming activities to meet opacity and plume length standards; and 18-2 Cover haul vehicles prior to exiting the site.	✓ Haul waste material immediately offsite
Unpaved roads/parking lots	19-1 Stabilize soils to meet the applicable performance standards; and 19-2 Limit vehicular travel to established unpaved roads (haul routes) and unpaved parking lots.	✓ Restricting vehicular access to established unpaved travel paths and parking lots can reduce stabilization requirements
Vacant land	20-1 In instances where vacant lots are 0.10 acre or larger and have a cumulative area of 500 square feet or more that are driven over and/or used by motor vehicles and/or off-road vehicles, prevent motor vehicle and/or off-road vehicle trespassing, parking and/or access by installing barriers, curbs, fences, gates, posts, signs, shrubs, trees or other effective control measures.	

5.1.2 Mitigation Measures for Exhaust Emissions of CO, ROG, NO_X, PM_{10}, and $PM_{2.5}$

- Develop and implement a trip reduction plan to achieve a 1.5 average vehicle ridership for construction employees. A trip reduction plan can reduce emissions of ROG, NO_X, CO, and PM_{10} from worker commutes by 0.1 to 2.2 percent, 0.1 to 2.9 percent, 0.1 to 2.9 percent, and 0.1 to 2.9 percent, respectively (SCAQMD, 1993).
- Implement a shuttle service for construction workers to and from retail services and food establishments during lunch hours. A shuttle service can reduce emissions of ROG, NO_X, CO and PM_{10} from lunch hour trips by 0.1 to 1.0 percent, 0.1 to 1.3 percent, 0.1 to 1.3 percent, and 0.1 to 1.3 percent, respectively (SCAQMD, 1993).
- Prohibit truck idling in excess of 2 minutes. Employ periodic, unscheduled inspections to limit unnecessary idling. The SCAQMD has not quantified the efficiency of this mitigation measure.
- Suspend use of all construction equipment operations during second-stage smog alerts. The SCAQMD has not quantified the efficiency of this mitigation measure.
- Use electricity, if feasible, from power poles rather than temporary diesel- or gasoline-powered generators. Using electricity from power poles is an effective measure to reduce emissions of ROG, NO_X, CO and PM_{10} from generators. Reduction efficiencies for these compounds are 97 to 99 percent.
- Implement Heavy Duty Truck Buyback Program

  The purpose of the buyback program would be to accelerate the modernizing of the heavy duty engine fleet operating in the South Coast Air Basin. By removing the older engines in the fleet and requiring replacement with newer, cleaner vehicles, a net reduction of NO_X emissions (and other combustion pollutants) would occur. This reduction would help offset marine vessel detour emissions.

  The protocols to be used would be consistent with the Carl Moyer Program, which is already being administered by the SCAQMD. However, this program is not available to projects such as Schuyler Heim Bridge Replacement and could not be used to actually implement this project's buy-back program. The Gateway Cities Diesel Fleet Modernization Program would be an example of a buyback program with similar reduction goals. Also, the POLA/POLB Clean Air Action Plan has a heavy duty truck buy back component. While participating in already existing programs might be preferable (and possible), it would not be necessary in order to accomplish heavy duty truck buy back. The heavy duty truck buy back could be done independently, though it would have to adhere to already accepted protocols (SCAQMD).

  A heavy duty truck buyback program would consist of three steps 1) identify target vehicles based on year of make; 2) provide incentives for operators to participate, 3) establish a means to ensure that replacements meet the net improvement forecasted.

  The construction phase of this project is where the greatest impact of increased emission levels occurs. Therefore, the buyback program would be designed to mitigate the NO_X

emissions during that time. Based on recent buyback programs, the program for the proposed project would cost an estimated $25,000 to $50,000/ton of NO_X reduced. As indicated, this cost can vary significantly and will continue to increase as time passes. The number of tons mitigated would be based on marine vessel detour NO_X emissions during construction. The rerouting of shipping vessels during project construction would amount to 132.8 lbs NO_X per day, which is equivalent to 24.2 tons NO_X per year. The indirect marine vessel emissions would be mitigated to a level that is below the SCAQMD significance threshold for construction emissions.

The sample calculation below estimates that each truck replacement reduces an average of 0.55 tons per year of NO_X and 0.12 tons per year of PM. This calculation has been generalized, but is based on emission factors representative of current buyback programs such as the Gateway Cities Diesel Fleet Modernization Program.

Sample Calculation

$$\text{OFFSET} = \frac{(\text{EFbase} - \text{EFopt}) \times \text{AL}}{454}$$

Where

OFFSET	=	Mobile source emission reduction offset (pounds of NO_X)
EFbase	=	Baseline emission factor (grams NO_X/mile) *Older Truck*
EFopt	=	Optional emission factor (grams NO_X/mile) *Newer Truck*
AL	=	Activity level (miles/year)
454	=	Conversion factor from grams to pounds

$$\text{OFFSET} = \frac{(24 \text{ grams/mile} - 14 \text{ grams/mile}) \times 50{,}000 \text{ miles/year}}{454}$$

= 1101 lbs/year NO_X/per truck

= 0.55 tons per year NO_X /per truck

OFFSET TARGET = 24.2 tons/year for duration of construction period

Therefore 24.2 tons/year/0.55 tons per year NO_X/per truck

= Approximately 44 trucks are needed to be purchased to reach targets

Note: These emission reductions would continue for 3 to 5 years, depending on the year of the truck updated. This timeframe would exceed the duration of the project construction phase.

- To the extent feasible, utilize construction equipment equipped with Tier 2 or new engines.
- Maintain and tune engines per manufacturer's specifications to perform at EPA certification levels and to perform at verified standards applicable to retrofit technologies. Employ periodic, unscheduled inspections to limit to ensure that construction equipment is properly maintained, tuned, and modified to established specifications.

- Prohibit tampering with engines and require continuing adherence to manufacturer's recommendations.

After implementation of the above mitigation efforts, impacts from construction would be expected to remain temporarily significant due to the scale of the project. Emissions from construction equipment exhaust alone would be above SCAQMD thresholds for all pollutants except PM_{10}.

5.2 Project Operations

The proposed action would not be expected to directly cause any significant air quality impacts during project operations. Therefore, mitigation would not be required for the project.

The proposed action would indirectly cause a significant air quality impact by increasing emissions from marine vessels. The increase in marine emissions would be above the SCAQMD significance threshold for NO_X after project operations begin. However, this emissions increase would be offset by the emissions reductions achieved by the truck buyback program implemented during project construction. The amount of NO_X emissions offset would be up to 133 lb/day (24.2 ton/year) at the beginning of project operation; emissions may gradually decrease over future years as the entire truck fleet becomes newer and cleaner. Mitigation measures that could be considered include the following:

- Provide incentives to affected marine vessel operators to modify vessel heights to minimize marine vessel detour emissions

5.2.1 Mitigation Measure for Health Risks

Caltrans has determined that there would be no significant impact on public health; therefore, Caltrans is not proposing any avoidance, minimization or mitigation measures. However, based on its conclusions as a Responsible Agency, ACTA will adopt the mitigation measure below as a condition of its approval for the proposed project.

- Retrofits of heating, ventilating and air conditioning (HVAC) units. New heating, ventilating, and air conditioning (HVAC) units, or retrofit of existing HVAC units, will be installed in residences within the vicinity of the significant impact zone.

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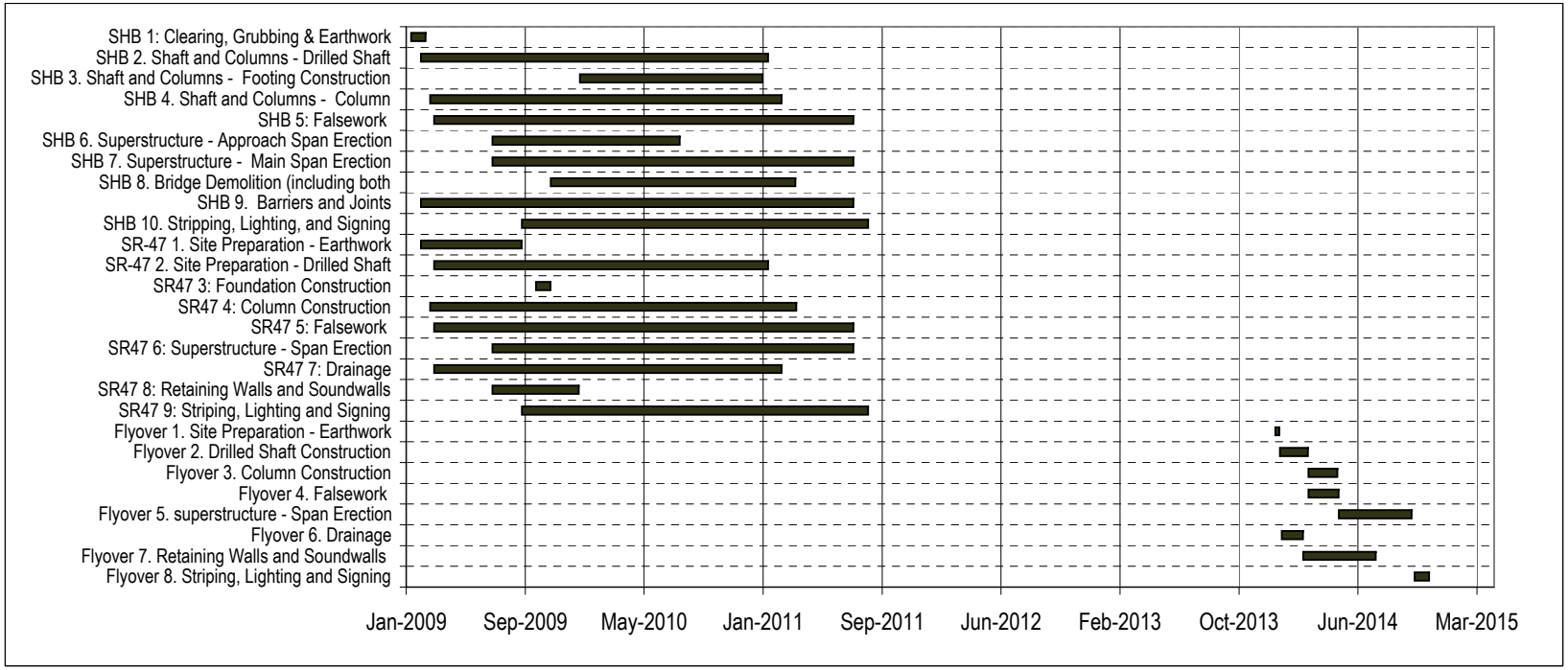
Appendix A
Construction Emission Calculations – Alternative 1, CIP Method

Appendix A:

Table A1: Construction Schedule (Case-in-place) - Alternative 1



Source: DMJM Harris, May 2005, January 2007

Appendix A:

Table A2: Maximum Construction Emissions: By Source (Case-in-place) - Alternative 1

Maximum Daily Construction Emissions

		CO (lb/day)	NOx (lb/day)	ROG (lb/day)	SOx (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
With Mitigation to Control Fugitive Dust	Maximum Construction Equipment Exhaust	831	1761	206	1.8	85	77
	Maximum Workers Commute	73	7.6	7.5	0.08	0.65	0.41
	Maximum Fugitive Dust	NA	NA	NA	NA	903	191
	Maximum Combined Daily Emissions	**905**	**1769**	**214**	**1.9**	**988**	**269**
SCAQMD Thresholds		550	100	75	150	150	55
Exceeding Thresholds?		YES	YES	YES	NO	YES	Yes

Note:

1. The maximum daily emissions from equipment exhaust, fugitive dust, and workers commute are not additive because these worst case emissions do not always occur on the same day.

Appendix A:
Table A3. Summary of Daily Emissions: by Construction Phase (Case-in-place) - Alternative 1

		Total Emissions without Watering (lb/day)									
Construction Phases		**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**PM_{10} Fugitive**	**PM_{10} Total**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ Fugitive**	**$PM_{2.5}$ Total**
1	SHB 1: Clearing, Grubbing & Earthwork	7.34	8.24	1.38	0.01	0.55	8.98	9.52	0.49	1.90	2.40
2	SHB 2. Shaft and Columns - Drilled Shaft Construction	55.11	109.50	13.46	0.12	4.99	61.87	66.86	4.55	13.12	17.67
3	SHB 3. Shaft and Columns - Footing Construction	53.57	107.19	12.80	0.13	4.59	56.01	60.60	4.16	11.87	16.03
4	SHB 4. Shaft and Columns - Column Construction	26.76	51.26	6.44	0.06	2.33	32.91	35.24	2.12	6.98	9.10
5	SHB 5: Falsework	117.31	322.90	25.10	0.27	12.85	424.08	436.93	11.77	89.90	101.68
6	SHB 6. Superstructure - Approach Span Erection	89.37	157.67	21.01	0.17	8.12	177.12	185.25	7.37	37.52	44.90
7	SHB 7. Superstructure - Main Span Erection	85.67	157.46	19.97	0.17	7.61	165.97	173.59	6.90	35.18	42.09
8	SHB 8. Bridge Demolition (including both approaches)	81.77	116.66	17.95	0.13	7.34	127.35	134.69	6.67	26.98	33.65
9	SHB 9. Barriers and Joints	6.73	5.81	0.89	0.01	0.24	17.68	17.93	0.21	3.75	3.95
10	SHB 10. Stripping, Lighting, and Signing	36.19	91.97	10.22	0.10	3.64	47.59	51.22	3.32	10.09	13.41
11	SR-47 1. Site Preparation - Earthwork	77.01	128.57	18.47	0.14	7.52	95.74	103.27	6.86	20.30	27.15
12	SR-47 2. Site Preparation - Drilled Shaft Construction	52.15	103.36	12.52	0.12	4.56	64.77	69.32	4.15	13.72	17.87
13	SR47 3: Foundation Construction	47.22	98.51	11.75	0.11	4.41	47.93	52.35	4.03	10.16	14.19
14	SR47 4: Column Construction	27.79	50.95	6.53	0.06	2.33	55.85	58.18	2.11	11.84	13.95
15	SR47 5: Falsework	56.77	101.32	14.17	0.11	6.08	51.86	57.94	5.57	10.99	16.56
16	SR47 6: Superstructure - Span Erection	113.20	212.00	27.69	0.23	10.78	175.96	186.73	9.80	37.25	47.05
17	SR47 7: Drainage	49.82	81.44	11.72	0.09	4.61	76.99	81.60	4.20	16.31	20.51
18	SR47 8: Retaining Walls and Soundwalls	51.00	83.86	11.86	0.09	4.82	59.11	63.93	4.38	12.50	16.88
19	SR47 9: Striping, Lighting and Signing	52.29	99.59	13.20	0.12	5.20	72.22	77.42	4.76	15.31	20.07
20	Flyover 1. Site Preparation - Earthwork	11.34	18.12	2.59	0.03	0.80	9.97	10.77	0.72	2.11	2.84
21	Flyover 2. Drilled Shaft Construction	43.65	72.98	9.52	0.13	3.19	29.96	33.16	2.89	6.35	9.24
22	Flyover 3. Column Construction	27.39	45.09	6.25	0.07	2.21	21.94	24.15	2.00	4.65	6.65
23	Flyover 4. Falsework	59.33	102.79	14.11	0.15	5.63	15.96	21.58	5.16	3.38	8.54
24	Flyover 5. superstructure - Span Erection	72.36	117.94	16.14	0.18	6.28	57.51	63.79	5.69	12.19	17.88
25	Flyover 6. Drainage	25.44	41.89	5.95	0.06	2.30	7.38	9.67	2.10	1.56	3.65
26	Flyover 7. Retaining Walls and Soundwalls	62.50	84.94	12.27	0.14	4.72	35.60	40.33	4.26	7.52	11.77
27	Flyover 8. Striping, Lighting and Signing	15.50	26.74	3.74	0.04	1.34	0.11	1.46	1.23	0.02	1.25
	Stock Piles (entire project)	0.00	0.00	0.00	0.00	0.00	79.82	79.82	0.00	16.60	16.60
	Overlapping phases										
	2,4,5,9,11,12,14,15,17	469	955	109	0.99	46	962	1007	41.5	204	245
	2,4,5,6,7,9,11,12,14,15,16,17,18	809	1566	190	1.66	77	1540	1617	70.0	326	396
	2,4,5,6,7,9,10,12,13,14,15,16,17,18,19	867	1728	207	1.84	83	1612	1694	75.2	341	416
	2,3,4,5,6,7,8,9,10,12,14,15,16,17,19	905	1769	214	1.90	85	1688	1773	77.7	357	435
	2,3,4,5,7,8,9,10,12,14,15,16,17,19	815	1611	193	1.72	77	1511	1588	70.3	320	390
	20	11	18	2.6	0.03	0.8	90	91	0.7	19	19
	21,25	69	115	15	0.19	5.5	117	123	5.0	25	29
	22,23,26	149	233	33	0.37	12.6	153	166	11.4	32	44
	27	16	27	3.7	0.04	1.3	80	81	1.2	17	18
	Max. Daily Emissions	**905**	**1769**	**214**	**1.9**	**85**	**1688**	**1773**	**78**	**357**	**435**

Note:
1. Based on the construction schedule, emissions from overlapping construction phases were added together to evaluate the worst case scenarios. The maximum daily emissions represent the scenario of overlapping phases with the highest emissions.
2. Fugitive dust emissions from stock piles were not calculated for each construction phase. The emissions were calculated separately based on a maximum area that the stock piles will cover during the entire construction duration.
3. The fugitive dusts were assumed to be controlled by 68% by watering the site 3 times per day, and 45% by watering the unpaved roads 3 times a day, according to the control efficiencies in SCAQMD CEQA Air Quality Handbook Table 11-4.
4. $PM_{2.5}$ emissions were calculated using the updated CEIDARS PM2.5 fractions In Appendix A of the *Final $PM_{2.5}$ Calculation Methodology and $PM_{2.5}$ Significance* Thresholds (SCAQMD, 2006) as following:

Appendix A:
Table A3. Summary of Daily Emissions: by Construction

		Total Emissions with Watering (lb/day)									
Construction Phases		**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**PM_{10} Fugitive**	**PM_{10} Total**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ Fugitive**	**$PM_{2.5}$ Total**
1	SHB 1: Clearing, Grubbing & Earthwork	7.34	8.24	1.38	0.01	0.55	4.94	5.48	0.49	1.05	1.54
2	SHB 2. Shaft and Columns - Drilled Shaft Construction	55.11	109.50	13.46	0.12	4.99	34.02	39.01	4.55	7.21	11.76
3	SHB 3. Shaft and Columns - Footing Construction	53.57	107.19	12.80	0.13	4.59	30.77	35.36	4.16	6.52	10.68
4	SHB 4. Shaft and Columns - Column Construction	26.76	51.26	6.44	0.06	2.33	18.10	20.43	2.12	3.84	5.96
5	SHB 5: Falsework	117.31	322.90	25.10	0.27	12.85	233.24	246.09	11.77	49.45	61.22
6	SHB 6. Superstructure - Approach Span Erection	89.37	157.67	21.01	0.17	8.12	95.89	104.01	7.37	20.32	27.69
7	SHB 7. Superstructure - Main Span Erection	85.67	157.46	19.97	0.17	7.61	90.94	98.56	6.90	19.28	26.18
8	SHB 8. Bridge Demolition (including both approaches)	81.77	116.66	17.95	0.13	7.34	69.20	76.54	6.67	14.66	21.33
9	SHB 9. Barriers and Joints	6.73	5.81	0.89	0.01	0.24	9.73	9.97	0.21	2.06	2.27
10	SHB 10. Stripping, Lighting, and Signing	36.19	91.97	10.22	0.10	3.64	26.11	29.75	3.32	5.54	8.86
11	SR-47 1. Site Preparation - Earthwork	77.01	128.57	18.47	0.14	7.52	52.66	60.18	6.86	11.16	18.02
12	SR-47 2. Site Preparation - Drilled Shaft Construction	52.15	103.36	12.52	0.12	4.56	34.95	39.50	4.15	7.41	11.55
13	SR47 3: Foundation Construction	47.22	98.51	11.75	0.11	4.41	26.35	30.76	4.03	5.59	9.61
14	SR47 4: Column Construction	27.79	50.95	6.53	0.06	2.33	30.72	33.05	2.11	6.51	8.63
15	SR47 5: Falsework	56.77	101.32	14.17	0.11	6.08	28.52	34.61	5.57	6.05	11.61
16	SR47 6: Superstructure - Span Erection	113.20	212.00	27.69	0.23	10.78	93.68	104.46	9.80	19.84	29.65
17	SR47 7: Drainage	49.82	81.44	11.72	0.09	4.61	41.61	46.22	4.20	8.82	13.01
18	SR47 8: Retaining Walls and Soundwalls	51.00	83.86	11.86	0.09	4.82	30.84	35.66	4.38	6.53	10.91
19	SR47 9: Striping, Lighting and Signing	52.29	99.59	13.20	0.12	5.20	39.63	44.83	4.76	8.40	13.16
20	Flyover 1. Site Preparation - Earthwork	11.34	18.12	2.59	0.03	0.80	5.49	6.28	0.72	1.16	1.88
21	Flyover 2. Drilled Shaft Construction	43.65	72.98	9.52	0.13	3.19	16.24	19.43	2.89	3.44	6.33
22	Flyover 3. Column Construction	27.39	45.09	6.25	0.07	2.21	12.07	14.27	2.00	2.56	4.55
23	Flyover 4. Falsework	59.33	102.79	14.11	0.15	5.63	8.78	14.40	5.16	1.86	7.02
24	Flyover 5. superstructure - Span Erection	72.36	117.94	16.14	0.18	6.28	31.63	37.91	5.69	6.71	12.40
25	Flyover 6. Drainage	25.44	41.89	5.95	0.06	2.30	3.59	5.88	2.10	0.76	2.85
26	Flyover 7. Retaining Walls and Soundwalls	62.50	84.94	12.27	0.14	4.72	17.70	22.43	4.26	3.74	8.00
27	Flyover 8. Striping, Lighting and Signing	15.50	26.74	3.74	0.04	1.34	0.04	1.38	1.23	0.01	1.23
	Stock Piles (entire project)	0.00	0.00	0.00	0.00	0.00	25.54	25.54	0.00	5.31	5.31
	Overlapping phases										
	2,4,5,9,11,12,14,15,17	469	955	109	0.99	46	509	555	42	108	149
	2,4,5,6,7,9,11,12,14,15,16,17,18	809	1566	190	1.66	77	820	897	70	174	244
	2,4,5,6,7,9,10,12,13,14,15,16,17,18,19	867	1728	207	1.84	83	860	942	75	182	257
	2,3,4,5,6,7,8,9,10,12,14,15,16,17,19	905	1769	214	1.90	85	903	988	78	191	269
	2,3,4,5,7,8,9,10,12,14,15,16,17,19	815	1611	193	1.72	77	807	884	70	171	241
	20	11	18	2.6	0.03	0.8	31	32	0.7	6.5	7.2
	21,25	69	115	15	0.19	5.5	45	51	5	10	15
	22,23,26	149	233	33	0.37	13	64	77	11	13	25
	27	16	27	3.7	0.04	1.3	26	27	1.2	5.3	6.5
	Max. Daily Emissions	**905**	**1769**	**214**	**1.9**	**85**	**903**	**988**	**78**	**191**	**269**

Appendix A:
Table A3. Summary of Daily Emissions: by Construction

		Construction Equipment Exhaust (lb/day)						Workers Commute (lb/day)					
	Construction Phases	**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**$PM_{2.5}$ Exhaust**	**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**$PM_{2.5}$ Exhaust**
1	SHB 1: Clearing, Grubbing & Earthwork	5.79	8.08	1.23	0.01	0.53	0.48	1.550	0.161	0.159	0.002	0.014	0.009
2	SHB 2. Shaft and Columns - Drilled Shaft Construction	49.68	108.93	12.91	0.12	4.94	4.52	5.424	0.563	0.556	0.006	0.048	0.030
3	SHB 3. Shaft and Columns - Footing Construction	51.26	106.93	12.54	0.12	4.56	4.14	2.314	0.257	0.256	0.003	0.024	0.015
4	SHB 4. Shaft and Columns - Column Construction	24.05	50.98	6.17	0.05	2.31	2.10	2.712	0.281	0.278	0.003	0.024	0.015
5	SHB 5: Falsework	111.50	322.30	24.50	0.27	12.80	11.74	5.811	0.603	0.595	0.006	0.052	0.032
6	SHB 6. Superstructure - Approach Span Erection	83.56	157.07	20.41	0.17	8.07	7.34	5.811	0.603	0.595	0.006	0.052	0.032
7	SHB 7. Superstructure - Main Span Erection	79.86	156.85	19.38	0.16	7.56	6.87	5.811	0.603	0.595	0.006	0.052	0.032
8	SHB 8. Bridge Demolition (including both approaches)	75.58	116.02	17.32	0.13	7.29	6.63	6.199	0.643	0.635	0.007	0.055	0.034
9	SHB 9. Barriers and Joints	4.41	5.57	0.66	0.01	0.22	0.19	2.325	0.241	0.238	0.003	0.021	0.013
10	SHB 10. Stripping, Lighting, and Signing	32.32	91.56	9.83	0.10	3.60	3.30	3.874	0.402	0.397	0.004	0.034	0.022
11	SR-47 1. Site Preparation - Earthwork	71.20	127.97	17.87	0.14	7.47	6.82	5.811	0.603	0.595	0.006	0.052	0.032
12	SR-47 2. Site Preparation - Drilled Shaft Construction	46.72	102.80	11.96	0.11	4.51	4.12	5.424	0.563	0.556	0.006	0.048	0.030
13	SR47 3: Foundation Construction	44.51	98.23	11.47	0.11	4.39	4.01	2.712	0.281	0.278	0.003	0.024	0.015
14	SR47 4: Column Construction	25.08	50.66	6.26	0.05	2.30	2.10	2.712	0.281	0.278	0.003	0.024	0.015
15	SR47 5: Falsework	50.96	100.72	13.58	0.11	6.03	5.53	5.811	0.603	0.595	0.006	0.052	0.032
16	SR47 6: Superstructure - Span Erection	103.51	211.00	26.69	0.22	10.69	9.75	9.686	1.005	0.992	0.011	0.086	0.054
17	SR47 7: Drainage	45.17	80.96	11.24	0.09	4.57	4.17	4.649	0.482	0.476	0.005	0.041	0.026
18	SR47 8: Retaining Walls and Soundwalls	46.74	83.41	11.42	0.09	4.78	4.36	4.262	0.442	0.437	0.005	0.038	0.024
19	SR47 9: Striping, Lighting and Signing	47.64	99.11	12.73	0.11	5.16	4.73	4.649	0.482	0.476	0.005	0.041	0.026
20	Flyover 1. Site Preparation - Earthwork	9.75	17.96	2.43	0.03	0.78	0.71	1.585	0.157	0.169	0.003	0.022	0.014
21	Flyover 2. Drilled Shaft Construction	41.01	72.72	9.24	0.12	3.16	2.87	2.641	0.262	0.281	0.004	0.037	0.024
22	Flyover 3. Column Construction	24.75	44.83	5.97	0.07	2.17	1.97	2.641	0.262	0.281	0.004	0.037	0.024
23	Flyover 4. Falsework	56.69	102.53	13.83	0.15	5.59	5.13	2.641	0.262	0.281	0.004	0.037	0.024
24	Flyover 5. superstructure - Span Erection	69.19	117.62	15.80	0.18	6.24	5.66	3.170	0.314	0.337	0.005	0.044	0.029
25	Flyover 6. Drainage	24.12	41.76	5.81	0.06	2.28	2.08	1.321	0.131	0.140	0.002	0.018	0.012
26	Flyover 7. Retaining Walls and Soundwalls	59.33	84.62	11.93	0.14	4.68	4.23	3.170	0.314	0.337	0.005	0.044	0.029
27	Flyover 8. Striping, Lighting and Signing	13.92	26.58	3.58	0.04	1.32	1.21	1.585	0.157	0.169	0.003	0.022	0.014
	Stock Piles (entire project)	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000
	Overlapping phases												
	2,4,5,9,11,12,14,15,17	429	951	105	0.94	45	41	41	4.2	4.2	0.045	0.36	0.23
	2,4,5,6,7,9,11,12,14,15,16,17,18	742	1559	183	1.58	76	70	66	6.9	6.8	0.073	0.59	0.37
	2,4,5,6,7,9,10,12,13,14,15,16,17,18,19	796	1720	199	1.76	82	75	72	7.4	7.3	0.079	0.64	0.40
	2,3,4,5,6,7,8,9,10,12,14,15,16,17,19	831	1761	206	1.81	85	77	73	7.6	7.5	0.081	0.65	0.41
	2,3,4,5,7,8,9,10,12,14,15,16,17,19	748	1604	186	1.65	77	70	67	7.0	6.9	0.075	0.60	0.38
	20	10	18	2.4	0.03	0.8	0.7	1.6	0.2	0.2	0.003	0.02	0.01
	21,25	65	114	15	0.19	5.4	5.0	4.0	0.4	0.4	0.006	0.06	0.04
	22,23,26	141	232	32	0.35	12	11	8.5	0.8	0.9	0.014	0.12	0.08
	27	14	27	3.6	0.04	1.3	1.2	1.6	0.2	0.2	0.003	0.02	0.01
	Max. Daily Emissions	**831**	**1761**	**206**	**1.8**	**85**	**77**	**73**	**7.6**	**7.5**	**0.08**	**0.65**	**0.41**

Appendix A:

Table A4: Construction Equipment Usage (Case-in-place) - Alternative 1

Schuyler Heim Bridge (SHB)

SHB 1. Site Preparation-Clearing, Grubbing & Earthwork

Construction duration from 1/11/2009 to 2/11/2009 This work will occur in stages as work areas become available.
Number of construction Workers 4 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe/excavator	NA	1	1	20	8	160	8	NA	NA	NA	NA
Pick Up	NA	1	1	20	4	80	NA	60	1	5	55
Haul Truck	NA	1	1	20	4	80	NA	50	2	4	46
Worker commute	NA	4	NA	NA	NA	NA	NA	40	1	0	40

SHB 2. Shaft and Columns - Drilled Shaft Construction

Construction duration from 2/1/2009 to 2/1/2011
Number of construction Workers 14 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**CIDH**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per CIDH**	**per CIDH**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
200 ton crane	NA	1	87	10	80	6960	8	NA	NA	NA	NA
Caisson Drill	NA	1	87	4	32	2784	8	NA	NA	NA	NA
140 ton crane	NA	1	87	7	56	4872	8	NA	NA	NA	NA
Generator	NA	2	87	10	80	13920	8	NA	NA	NA	NA
Flatbed	NA	2	87	8	64	11136	NA	50	1.5	6	44
Pick Up	NA	4	87	10	80	27840	NA	50	1.5	10	40
Concrete Truck	NA	5	87	2	16	6960	NA	32	2	2	30
Concrete Pump Truck	NA	1	87	2	16	1392	8	NA	NA	NA	NA
Compressor	NA	2	87	10	80	13920	8	NA	NA	NA	NA
Water Truck	NA	1	87	4	32	2784	8	NA	NA	NA	NA
Worker commute	NA	14	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	3848	40	ft^3	290
Soil loading	3	0.5	yd^3	7.0

Appendix A:

Table A4: Construction Equipment Usage (Case-in-place) - Alternative 1 (continued)

SHB 3. Shaft and Columns - Footing Construction

Construction duration from 1/1/2010 to 1/20/2011

Number of construction Workers 7 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Embank. Wall**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per Wall**	**per Wall**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe/excavator	NA	1	2	5	40	80	8	NA	NA	NA	NA
140 ton crane	NA	1	2	2	16	32	8	NA	NA	NA	NA
Generator	NA	1	2	10	80	160	8	NA	NA	NA	NA
Haul Truck	NA	4	2	5	40	320	NA	50	2	4	46
Pick Up	NA	2	2	10	80	320	NA	50	1.5	10	40
Concrete Truck	NA	10	2	2	16	320	NA	32	2	2	30
Concrete Pump Truck	NA	2	2	2	16	64	8	NA	NA	NA	NA
Compressor	NA	1	2	10	80	160	8	NA	NA	NA	NA
Water Truck	NA	1	2	4	32	64	8	NA	NA	NA	NA
Worker commute	NA	7	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	2400	86	ft^3	28
Soil loading	22	3	yd^3	7

SHB 4. Shaft and Columns - Column Construction

Construction duration from 2/20/2009 to 3/1/2011

Number of construction Workers 7 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Columns**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per Col.**	**per Col.**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
140 ton crane	NA	1	87	1	8	696	8	NA	NA	NA	NA
Generator	NA	1	87	4	32	2784	8	NA	NA	NA	NA
Flatbed	NA	1	87	2.5	20	1740	NA	50	1.5	6	44
Pick Up	NA	2	87	4	32	5568	NA	50	1.5	10	40
Concrete Truck	NA	3.5	87	1	8	2436	NA	32	2	2	30
Concrete Pump Truck	NA	1	87	1	8	696	8	NA	NA	NA	NA
Compressor	NA	1	87	4	32	2784	8	NA	NA	NA	NA
Worker commute	NA	7	NA	NA	NA	NA	NA	40	1	0	40

Appendix A:

Table A4: Construction Equipment Usage (Case-in-place) - Alternative 1 (continued)

SHB 5. Falsework

Construction duration from 3/1/2009 to 7/30/2011

Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
140 ton crane	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
Generator	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
Flatbed	NA	2	20	400	3200	6400	NA	50	1.5	6	44
Pick Up	NA	4	20	400	3200	12800	NA	50	1.5	10	40
Rough Terrain (f - lift)	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
Scissor Lift	NA	2	15	300	2400	4800	8	NA	NA	NA	NA
Compressor	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
Boom	NA	2	15	300	2400	4800	8	NA	NA	NA	NA
Semi Truck	NA	10	0.5	10	20	200	NA	20	1	20	0
Loader	NA	2	1	20	160	320	8	NA	NA	NA	NA
Tug boat	NA	1	1.5	30	240	240	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

SHB 6. superstructure - Approach Span Erection

Construction duration from 7/1/2009 to 7/30/2010

Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
275 ton crane	NA	1	18	360	2880	2880	8	NA	NA	NA	NA
Rough Terrain (f-lift)	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
140 ton crane	NA	1	20	400	3200	3200	8	NA	NA	NA	NA
Generator	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
Semi Truck	NA	4	10	200	1600	6400	NA	42	1	2	40
Flatbed	NA	6	12	240	1920	11520	NA	50	1.5	6	44
Pick Up	NA	10	20	400	3200	32000	NA	50	1.5	10	40
Concrete Truck	NA	10	10	200	1600	16000	NA	32	2	2	30
Concrete Pump Truck	NA	2	10	200	1600	3200	8	NA	NA	NA	NA
Compressor	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	127340	2122	ft^3	60
Grading	2	0.1	acre	20
Soil loading	1572	79	yd^3	20

Appendix A:

Table A4: Construction Equipment Usage (Case-in-place) - Alternative 1 (continued)

SHB 7. superstructure - Main Span Erection

Construction duration from 7/1/2009 to 7/30/2011

Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
275 ton crane	NA	2	8	160	1280	2560	8	NA	NA	NA	NA
Rough Terrain (f-lift)	NA	2	10	200	1600	3200	8	NA	NA	NA	NA
140 ton crane	NA	2	10	200	1600	3200	8	NA	NA	NA	NA
Generator	NA	2	18	360	2880	5760	8	NA	NA	NA	NA
Semi Truck	NA	4	10	200	1600	6400	NA	42	1	2	40
Flatbed	NA	5	18	360	2880	14400	NA	50	1.5	6	44
Pick Up	NA	10	18	360	2880	28800	NA	50	1.5	10	40
Concrete Truck	NA	10	10	200	1600	16000	NA	32	2	2	30
Concrete Pump Truck	NA	2	10	200	1600	3200	8	NA	NA	NA	NA
Compressor	NA	2	18	360	2880	5760	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	11550	192.5	ft^3	60
Grading	1.5	0.1	acre	30
Soil loading	42.8	2	yd^3	20

SHB 8. Bridge Demolition (including both approaches)

Construction duration from 11/1/2009 to 3/30/2011

Number of construction Workers 16 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Pick Up	NA	6	6	120	3	2160	NA	50	1.5	10	40
Haul Truck	NA	10	6	120	4	4800	NA	50	2	4	46
Compressor	NA	4	6	120	8	3840	8	NA	NA	NA	NA
Generator	NA	4	6	120	6	2880	8	NA	NA	NA	NA
Flatbed	NA	4	6	120	3	1440	NA	50	1.5	6	44
Backhoe/excavator	NA	4	6	120	8	3840	8	NA	NA	NA	NA
Loader	NA	3	6	120	4	1440	8	NA	NA	NA	NA
Worker commute	NA	16	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Demolition	62500	391	ft^3	160
Excavation	40300	672	ft^4	60
Grading	2	0.1	acre	20
Soil loading	299	15	yd^3	20

Appendix A:

Table A4: Construction Equipment Usage (Case-in-place) - Alternative 1 (continued)

SHB 9. Barriers and Joints

Construction duration from 2/1/2009 to 7/30/2011

Number of construction Workers 6 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Pick Up	NA	1	6	120	480	480	NA	50	1	6	44
Concrete Trucks	NA	2	6	120	960	1920	NA	32	2	2	30
Flatbed Truck	NA	1	6	120	480	480	NA	40	1	4	36
Semi Truck	NA	1	6	120	480	480	NA	42	1	2	40
Worker commute	NA	6	NA	NA	NA	NA	NA	40	1	0	40

SHB 10. Stripping, Lighting, and Signing

Construction duration from 9/1/2009 to 8/30/2011

Number of construction Workers 10 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Pick Up	NA	4	2	40	3	480	NA	50	1.5	10	40
Paint truck	NA	1	1.5	30	7	210	8	NA	NA	NA	NA
Compressor	NA	1	1.5	30	7	210	8	NA	NA	NA	NA
Bucket Truck	NA	2	2	40	5	400	8	NA	NA	NA	NA
Semi Truck	NA	2	0.5	10	4	80	NA	42	1	2	40
Boom Truck	NA	1	0.5	10	6	60	8	NA	NA	NA	NA
Worker commute	NA	10	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
excavation	11781	589	ft^3	20

Appendix A:

Table A4: Construction Equipment Usage (Case-in-place) - Alternative 1 (continued)

SR-47 Truck Expressway

SR-47 1. Site Preparation - Earthwork

Construction duration from 2/1/2009 to 9/1/2009

Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Loader	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Haulers (Truck)	NA	6	4	80	640	3840	NA	50	2	4	46
Generator	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Flatbed	NA	2	6	120	960	1920	NA	50	1.5	6	44
Pick Up	NA	6	6	120	960	5760	NA	50	1.5	10	40
Grader	NA	2	3	60	480	960	8	NA	NA	NA	NA
Vibratory loader	NA	2	3	60	480	960	8	NA	NA	NA	NA
Asphalt Paver	NA	1	2	40	320	320	8	NA	NA	NA	NA
Compressor	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Water Truck	NA	1	5	100	800	800	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

SR-47 2. Site Preparation - Drilled Shaft Construction

Construction duration from 3/1/2009 to 2/1/2011

Number of construction Workers 14 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**CIDH**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per CIDH**	**per CIDH**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
200 ton crane	NA	1	120	10	80	9600	8	NA	NA	NA	NA
Caisson Drill	NA	1	120	4	32	3840	8	NA	NA	NA	NA
140 ton crane	NA	1	120	7	56	6720	8	NA	NA	NA	NA
Generator	NA	2	120	10	80	19200	8	NA	NA	NA	NA
Flatbed	NA	2	120	10	80	19200	NA	50	1.5	6	44
Pick Up	NA	4	120	10	80	38400	NA	50	1.5	10	40
Concrete Truck	NA	5	120	2	16	9600	NA	32	2	2	30
Concrete Pump Truck	NA	1	120	2	16	1920	8	NA	NA	NA	NA
Compressor	NA	1	120	1	8	960	8	NA	NA	NA	NA
Water Truck	NA	1	120	4	32	3840	8	NA	NA	NA	NA
Worker commute	NA	14	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Demolition	13572	226	ft^3	60
Excavation	16286	271	ft^3	60
Grading	2	0.1	acre	20
Soil Loading	42	2	yd^3	20

Appendix A:

Table A4: Construction Equipment Usage (Case-in-place) - Alternative 1 (continued)

SR-47 3. Foundation Construction

Construction duration from 10/1/2009 to 11/1/2009
Number of construction Workers 7 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe/excavator	NA	1	1	20	160	160	8	NA	NA	NA	NA
140 ton crane	NA	1	0.5	10	80	40	8	NA	NA	NA	NA
Generator	NA	1	1	20	160	160	8	NA	NA	NA	NA
Haul Truck	NA	4	0.5	10	80	160	NA	50	2	4	46
Pick Up	NA	3	1	20	160	480	NA	50	1.5	10	40
Concrete Truck	NA	1	0.25	5	40	10	NA	32	2	2	30
Concrete Pump Truck	NA	1	0.25	5	40	10	8	NA	NA	NA	NA
Compressor	NA	1	0.5	10	80	40	8	NA	NA	NA	NA
Water Truck	NA	1	0.5	10	80	40	8	NA	NA	NA	NA
Pile Driver	NA	2	1	20	160	320	8	NA	NA	NA	NA
Worker commute	NA	7	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	408	81.6	ft^3	5
Soil Loading	3.0	0.6	yd^3	5

SR-47 4. Column Construction

Construction duration from 2/20/2009 to 4/1/2011
Number of construction Workers 7 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Columns**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per Col.**	**per Col.**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
140 ton crane	NA	1	120	1	8	960	8	NA	NA	NA	NA
Generator	NA	1	120	4	32	3840	8	NA	NA	NA	NA
Flatbed	NA	2	120	2	16	3840	NA	50	1.5	6	44
Pick Up	NA	4	120	4	32	15360	NA	50	1.5	10	40
Concrete Truck	NA	2	120	1	8	1920	NA	32	2	2	30
Concrete Pump Truck	NA	1	120	1	8	960	8	NA	NA	NA	NA
Compressor	NA	1	120	4	32	3840	8	NA	NA	NA	NA
Worker commute	NA	7	NA	NA	NA	NA	NA	40	1	0	40

Appendix A:

Table A4: Construction Equipment Usage (Case-in-place) - Alternative 1 (continued)

SR-47 5. Falsework

Construction duration from 3/1/2009 to 7/30/2011
Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
100 ton crane	NA	1	30	600	4800	4800	8	NA	NA	NA	NA
Generator	NA	2	30	600	4800	9600	8	NA	NA	NA	NA
Flatbed	NA	2	30	600	4800	9600	NA	50	1.5	6	44
Pick Up	NA	4	30	600	4800	19200	NA	50	1.5	10	40
Rough Terrain (f - lift)	NA	4	30	600	4800	19200	8	NA	NA	NA	NA
Scissor Lift	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
Compressor	NA	2	30	600	4800	9600	8	NA	NA	NA	NA
Boom	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

SR-47 6. Superstructure - Span Erection

Construction duration from 7/1/2009 to 7/30/2011
Number of construction Workers 25 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
275 ton crane	NA	1	18	360	2880	2880	8	NA	NA	NA	NA
Rough Terrain (f-lift)	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
140 ton crane	NA	1	20	400	3200	3200	8	NA	NA	NA	NA
Generator	NA	4	18	360	2880	11520	8	NA	NA	NA	NA
Semi Truck	NA	4	16	320	2560	10240	NA	42	1	2	40
Flatbed	NA	4	20	400	3200	12800	NA	50	1.5	6	44
Pick Up	NA	10	20	400	3200	32000	NA	50	1.5	10	40
Concrete Truck	NA	12	9	180	1440	17280	NA	32	2	2	30
Concrete Pump Truck	NA	4	9	180	1440	5760	8	NA	NA	NA	NA
Compressor	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
Worker commute	NA	25	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Demolition	120000	12000	ft^3	10
Excavation	12000	1200	ft^3	10
grading	1.5	0.3	acre	5
paving	1.5	0.15	acre	10

Appendix A:

Table A4: Construction Equipment Usage (Case-in-place) - Alternative 1 (continued)

SR-47 7. Drainage

Construction duration from 3/1/2009 to 3/1/2011

Number of construction Workers 12 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe	NA	1	6	120	960	960	8	NA	NA	NA	NA
Loader	NA	1	6	120	960	960	8	NA	NA	NA	NA
Haulers (Truck)	NA	2	2	40	320	640	NA	50	2	4	46
Generator	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Flatbed	NA	4	6	120	960	3840	NA	50	1.5	6	44
Pick Up	NA	4	6	120	960	3840	NA	50	1.5	10	40
Vibratory Roller	NA	2	3	60	480	960	8	NA	NA	NA	NA
Compressor	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Water Truck	NA	1	3	60	480	480	8	NA	NA	NA	NA
Concrete Truck	NA	1	1	20	160	160	NA	32	2	2	30
Worker commute	NA	12	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Demolition	105600	660	ft^3	160
Excavation	73920	616	ft^4	120
grading	2	0.10	acre	20
Paving	2	0.07	acre	30
Soil dumping	10	0.5	yd^3	60

SR-47 8. Retaining Walls and Soundwalls - - MSE Walls at Ramps and Touchdowns

Construction duration from 7/1/2009 to 12/30/2009

Number of construction Workers 11 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Loader	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Haulers (Truck)	NA	4	5	100	800	3200	NA	50	2	4	46
Generator	NA	1	6	120	960	960	8	NA	NA	NA	NA
Flatbed	NA	2	4	80	640	1280	NA	50	1.5	6	44
Pick Up	NA	2	6	120	960	1920	NA	50	1.5	10	40
Vibratory Roller	NA	2	3	60	480	960	8	NA	NA	NA	NA
Compressor	NA	1	6	120	960	960	8	NA	NA	NA	NA
Water Truck	NA	1	4	80	640	640	8	NA	NA	NA	NA
Concrete Truck	NA	2	1	20	160	320	NA	32	2	2	30
Worker commute	NA	11	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	100000	2500	ft^3	40
Grading	2	0.2	acre	10
Soil Loading	231	23	yd^3	10

Appendix A:

Table A4: Construction Equipment Usage (Case-in-place) - Alternative 1 (continued)

SR-47 9. Striping, Lighting and Signing

Construction duration from 9/1/2009 to 8/30/2011

Number of construction Workers 12 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Boom	NA	4	4	80	640	2560	8	NA	NA	NA	NA
Loader	NA	1	2	40	320	320	8	NA	NA	NA	NA
Generator	NA	3	6	120	960	2880	8	NA	NA	NA	NA
Flatbed	NA	2	6	120	960	1920	NA	50	1.5	6	44
Pick Up	NA	6	6	120	960	5760	NA	50	1.5	10	40
Compressor	NA	3	6	120	960	2880	8	NA	NA	NA	NA
Striper (Truck)	NA	1	4	80	640	640	8	NA	NA	NA	NA
Worker commute	NA	12	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	29452	982	ft^3	30

SHB and SR-47: Stockpile Area

Construction duration from 1/11/2009 to 8/30/2011

	Maximum Area Covered	**Unit**
Stock Piles	2	acres/day

1. Construction data provided by DMJM Harris, May 2005
2. Stock pile areas were not specified for each construction phases. The maximum areas that might be covered each day by the whole project was used to calculate the total fugitive dust emissions from stock piles.
3. Please refer to Appendix A1 for details of flyover construction emission calculations.

Appendix A:

Table A5: Emission Factors (Case-in-place) - Alternative 1

SHB 1. Site Preparation-Clearing, Grubbing & Earthwork

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Equipment Code	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe/excavator	Tractors/Loaders/Backhoes	1	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051429	0.000
Pick Up	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000054	0.211
Haul Truck	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.000692	0.211
Worker commute	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000054	0.211

SHB 2. Shaft and Columns - Drilled Shaft Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Equipment Code	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
200 ton crane	Cranes	1	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.0624	0.000
Caisson Drill	Bore/Drill Rigs	1	2009	lb/hr	0.520	1.229	0.116	0.002	0.054	0.000	0.0497	0.000
140 ton crane	Cranes	1	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.0624	0.000
Generator	Generator Sets	1	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.0381	0.000
Flatbed	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Pick Up	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Concrete Truck	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Concrete Pump Truck	Off-Highway Trucks	1	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.0855	0.000
Compressor	Air compressor	1	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.0503	0.000
Water Truck	Off-Highway Trucks	1	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.0855	0.000
Worker commute	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Excavation	Excavation	12	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.0000	0.000
Soil loading	Soil loading	14	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.03969	0.0000	0.008

Table A5: Emission Factors (Case-in-place) - Alternative 1 (continued)

SHB 3. Shaft and Columns - Footing Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Equipment Code	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe/excavator	Tractors/Loaders/Backhoes	1	2010	lb/hr	0.393	0.675	0.102	0.001	0.052	0.000	0.0479	0.000
140 ton crane	Cranes	1	2010	lb/hr	0.543	1.451	0.159	0.001	0.064	0.000	0.0591	0.000
Generator	Generator Sets	1	2010	lb/hr	0.329	0.644	0.096	0.001	0.040	0.000	0.0365	0.000
Haul Truck	On-road Delivery	3	2010	lb/VMT	0.018	0.021	0.003	0.00003	0.00075	0.997	0.0006	0.211
Pick Up	On-road passenger	4	2010	lb/VMT	0.008	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Concrete Truck	On-road Delivery	3	2010	lb/VMT	0.018	0.021	0.003	0.00003	0.00075	0.997	0.0006	0.211
Concrete Pump Truck	Off-Highway Trucks	1	2010	lb/hr	0.743	2.388	0.248	0.003	0.088	0.000	0.0805	0.000
Compressor	Air compressor	1	2010	lb/hr	0.361	0.732	0.112	0.001	0.053	0.000	0.0484	0.000
Water Truck	Off-Highway Trucks	1	2010	lb/hr	0.743	2.388	0.248	0.003	0.088	0.000	0.0805	0.000
Worker commute	On-road passenger	4	2010	lb/VMT	0.008	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Excavation	Excavation	12	2010	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.0000	0.000
Soil loading	Soil loading	14	2010	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.0000	0.008

SHB 4. Shaft and Columns - Column Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Equipment Code	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
140 ton crane	Cranes	1	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.0624	0.000
Generator	Generator Sets	1	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.0381	0.000
Flatbed	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Pick Up	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Concrete Truck	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Concrete Pump Truck	Off-Highway Trucks	1	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.0855	0.000
Compressor	Air compressor	1	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.0503	0.000
Worker commute	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211

Appendix A:

Table A5: Emission Factors (Case-in-place) - Alternative 1 (continued)

SHB 5. Falsework

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Equipment Code	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
140 ton crane	Cranes	1	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.0624	0.000
Generator	Generator Sets	1	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.0381	0.000
Flatbed	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Pick Up	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Rough Terrain (f - lift)	Rough Terrain Forklifts	1	2009	lb/hr	0.482	0.851	0.137	0.001	0.072	0.000	0.0661	0.000
Scissor Lift	Other Construction Equipment	1	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.0433	0.000
Compressor	Air compressor	1	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.0503	0.000
Boom	Other Construction Equipment	1	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.0433	0.000
Semi Truck	On-road HHDT	2	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.002	1.861	0.0018	0.395
Loader	Tractors/Loaders/Backhoes	1	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.0514	0.000
Tug boat	Ship	5	2009	lb/hr	5.878	23.677	0.893	0.016	0.616	0.000	0.5667	0.000
Worker commute	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211

SHB 6. superstructure - Approach Span Erection

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Equipment Code	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
275 ton crane	Cranes	1	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.0624	0.000
Rough Terrain (f-lift)	Rough Terrain Forklifts	1	2009	lb/hr	0.482	0.851	0.137	0.001	0.072	0.000	0.0661	0.000
140 ton crane	Cranes	1	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.0624	0.000
Generator	Generator Sets	1	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.0381	0.000
Semi Truck	On-road HHDT	2	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.002	1.861	0.0018	0.395
Flatbed	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Pick Up	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Concrete Truck	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Concrete Pump Truck	Off-Highway Trucks	1	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.0855	0.000
Compressor	Air compressor	1	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.0503	0.000
Worker commute	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Excavation	Excavation	12	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.0000	0.000
Grading	Grading	17	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.0000	5.491
Soil loading	Soil loading	14	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.0000	0.008

Appendix A:

Table A5: Emission Factors (Case-in-place) - Alternative 1 (continued)

SHB 7. superstructure - Main Span Erection

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Equipment Code	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
275 ton crane	Cranes	1	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.0624	0.000
Rough Terrain (f-lift)	Rough Terrain Forklifts	1	2009	lb/hr	0.482	0.851	0.137	0.001	0.072	0.000	0.0661	0.000
140 ton crane	Cranes	1	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.0624	0.000
Generator	Generator Sets	1	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.0381	0.000
Semi Truck	On-road HHDT	2	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.002	1.861	0.0018	0.395
Flatbed	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Pick Up	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Concrete Truck	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Concrete Pump Truck	Off-Highway Trucks	1	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.0855	0.000
Compressor	Air compressor	1	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.0503	0.000
Worker commute	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Excavation	Excavation	12	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.0000	0.000
Grading	Grading	17	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.0000	5.491
Soil loading	Soil loading	14	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.0000	0.008
		#N/A										

SHB 8. Bridge Demolition (including both approaches)

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Equipment Code	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Pick Up	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Haul Truck	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Compressor	Air compressor	1	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.0503	0.000
Generator	Generator Sets	1	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.0381	0.000
Flatbed	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Backhoe/excavator	Tractors/Loaders/Backhoes	1	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.0514	0.000
Loader	Tractors/Loaders/Backhoes	1	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.0514	0.000
Worker commute	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Demolition	Demolition	11	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.0000	0.000
Excavation	Excavation	12	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.0000	0.000
Grading	Grading	17	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.0000	5.491
Soil loading	Soil loading	14	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.0000	0.008

Appendix A:

Table A5: Emission Factors (Case-in-place) - Alternative 1 (continued)

SHB 9. Barriers and Joints

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Equipment Code	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Pick Up	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Concrete Trucks	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Flatbed Truck	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Semi Truck	On-road HHDT	2	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.002	1.861	0.0018	0.395
Worker commute	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211

SHB 10. Stripping, Lighting, and Signing

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Equipment Code	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Pick Up	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Paint truck	Off-Highway Trucks	1	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.0855	0.000
Compressor	Air compressor	1	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.0503	0.000
Bucket Truck	Off-Highway Trucks	1	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.0855	0.000
Semi Truck	On-road HHDT	2	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.002	1.861	0.0018	0.395
Boom Truck	Off-Highway Trucks	1	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.0855	0.000
Worker commute	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Excavation	Excavation	12	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.0000	0.000

Appendix A:

Table A5: Emission Factors (Case-in-place) - Alternative 1 (continued)

SR-47 1. Site Preparation - Earthwork

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Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Equipment Code	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe	Tractors/Loaders/Backhoes	1	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.0514	0.000
Loader	Tractors/Loaders/Backhoes	1	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.0514	0.000
Haulers (Truck)	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Generator	Generator Sets	1	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.0381	0.000
Flatbed	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Pick Up	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Grader	Graders	1	2009	lb/hr	0.643	1.524	0.183	0.001	0.080	0.000	0.0732	0.000
Vibratory loader	Tractors/Loaders/Backhoes	1	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.0514	0.000
Asphalt Paver	Pavers	1	2009	lb/hr	0.576	1.032	0.187	0.001	0.074	0.000	0.0680	0.000
Compressor	Air compressor	1	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.0503	0.000
Water Truck	Off-Highway Trucks	1	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.0855	0.000
Worker commute	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211

SR-47 2. Site Preparation - Drilled Shaft Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Equipment Code	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
200 ton crane	Cranes	1	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.0624	0.000
Caisson Drill	Bore/Drill Rigs	1	2009	lb/hr	0.520	1.229	0.116	0.002	0.054	0.000	0.0497	0.000
140 ton crane	Cranes	1	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.0624	0.000
Generator	Generator Sets	1	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.0381	0.000
Flatbed	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Pick Up	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Concrete Truck	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Concrete Pump Truck	Off-Highway Trucks	1	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.0855	0.000
Compressor	Air compressor	1	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.0503	0.000
Water Truck	Off-Highway Trucks	1	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.0855	0.000
Worker commute	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Demolition	Demolition	11	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.0000	0.000
Excavation	Excavation	12	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.0000	0.000
Grading	Grading	17	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.0000	5.491
Soil Loading	Soil Loading	14	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.0000	0.008
		#N/A										

Appendix A:

Table A5: Emission Factors (Case-in-place) - Alternative 1 (continued)

SR-47 3. Foundation Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Equipment Code	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe/excavator	Tractors/Loaders/Backhoes	1	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.0514	0.000
140 ton crane	Cranes	1	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.0624	0.000
Generator	Generator Sets	1	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.0381	0.000
Haul Truck	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Pick Up	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Concrete Truck	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Concrete Pump Truck	Off-Highway Trucks	1	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.0855	0.000
Compressor	Air compressor	1	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.0503	0.000
Water Truck	Off-Highway Trucks	1	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.0855	0.000
Pile Driver	Other Construction Equipment	1	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.0433	0.000
Worker commute	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Excavation	Excavation	12	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.0000	0.000
Soil Loading	Soil Loading	14	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.0000	0.008
		#N/A										

SR-47 4. Column Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Equipment Code	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
140 ton crane	Cranes	1	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.0624	0.000
Generator	Generator Sets	1	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.0381	0.000
Flatbed	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Pick Up	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Concrete Truck	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Concrete Pump Truck	Off-Highway Trucks	1	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.0855	0.000
Compressor	Air compressor	1	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.0503	0.000
Worker commute	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211

Appendix A:

Table A5: Emission Factors (Case-in-place) - Alternative 1 (continued)

SR-47 5. Falsework

Emission Factors (see Appendix I for details and reference of emission factors)

Equipment Description	Equipment type	Equipment Code	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
0												
100 ton crane	Cranes	1	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.0624	0.000
Generator	Generator Sets	1	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.0381	0.000
Flatbed	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Pick Up	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Rough Terrain (f - lift)	Rough Terrain Forklifts	1	2009	lb/hr	0.482	0.851	0.137	0.001	0.072	0.000	0.0661	0.000
Scissor Lift	Other Construction Equipment	1	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.0433	0.000
Compressor	Air compressor	1	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.0503	0.000
Boom	Other Construction Equipment	1	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.0433	0.000
Worker commute	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211

SR-47 6. Superstructure - Span Erection

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Equipment Code	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
275 ton crane	Cranes	1	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.0624	0.000
Rough Terrain (f-lift)	Rough Terrain Forklifts	1	2009	lb/hr	0.482	0.851	0.137	0.001	0.072	0.000	0.0661	0.000
140 ton crane	Cranes	1	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.0624	0.000
Generator	Generator Sets	1	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.0381	0.000
Semi Truck	On-road HHDT	2	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.002	1.861	0.0018	0.395
Flatbed	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Pick Up	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Concrete Truck	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Concrete Pump Truck	Off-Highway Trucks	1	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.0855	0.000
Compressor	Air compressor	1	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.0503	0.000
Worker commute	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Demolition	Demolition	11	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.0000	0.000
Excavation	Excavation	12	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.0000	0.000
grading	grading	17	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.0000	5.491
paving	paving	13	2009	lb ROG / acre	0.000	0.000	2.620	0.000	0.000	0.000	0.0000	0.000

Table A5: Emission Factors (Case-in-place) - Alternative 1 (continued)

SR-47 7. Drainage

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Equipment Code	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe	Tractors/Loaders/Backhoes	1	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.0514	0.000
Loader	Tractors/Loaders/Backhoes	1	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.0514	0.000
Haulers (Truck)	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Generator	Generator Sets	1	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.0381	0.000
Flatbed	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Pick Up	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Vibratory Roller	Rollers	1	2009	lb/hr	0.427	0.817	0.125	0.001	0.057	0.000	0.0528	0.000
Compressor	Air compressor	1	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.0503	0.000
Water Truck	Off-Highway Trucks	1	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.0855	0.000
Concrete Truck	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Worker commute	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Demolition	Demolition	11	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.0000	0.000
Excavation	Excavation	12	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.0000	0.000
grading	grading	17	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.0000	5.491
Paving	Paving	13	2009	lb ROG / acre	0.000	0.000	2.620	0.000	0.000	0.000	0.0000	0.000
Soil dumping	Soil dumping	15	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.016	0.0000	0.003
		#N/A										

SR-47 8. Retaining Walls and Soundwalls - - MSE Walls at Ramps and Touchdowns

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Equipment Code	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe	Tractors/Loaders/Backhoes	1	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.0514	0.000
Loader	Tractors/Loaders/Backhoes	1	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.0514	0.000
Haulers (Truck)	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Generator	Generator Sets	1	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.0381	0.000
Flatbed	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Pick Up	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Vibratory Roller	Rollers	1	2009	lb/hr	0.427	0.817	0.125	0.001	0.057	0.000	0.0528	0.000
Compressor	Air compressor	1	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.0503	0.000
Water Truck	Off-Highway Trucks	1	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.0855	0.000
Concrete Truck	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Worker commute	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Excavation	Excavation	12	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.0004	0.0000	0.000
Grading	Grading	17	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.0000	5.491
Soil Loading	Soil Loading	14	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.0000	0.008
		#N/A										

Appendix A:

Table A5: Emission Factors (Case-in-place) - Alternative 1 (continued)

SR-47 9. Striping, Lighting and Signing

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Equipment Code	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Boom	Other Construction Equipment	1	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.0433	0.000
Loader	Tractors/Loaders/Backhoes	1	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.0514	0.000
Generator	Generator Sets	1	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.0381	0.000
Flatbed	On-road Delivery	3	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.0007	0.211
Pick Up	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Compressor	Air compressor	1	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.0503	0.000
Striper (Truck)	Off-Highway Trucks	1	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.0855	0.000
Worker commute	On-road passenger	4	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.0001	0.211
Excavation	Excavation	12	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.000	0.0000	0.000

SHB and SR-47: Stockpile Area

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Equipment Code	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Stock piles	Stock piles	16	All	lb/acre/day	0.000	0.000	0.000	0.000	0.000	39.908	0.000000	8.301

Note:

1. Stock pile areas were not specified or calculated for each construction phases. The maximum areas that might be covered each day by the whole project was used to calculate the total fugitive dust emissions from stock piles.

2. Detailed references of the emission factors are in Appendix I.

Appendix A:

Table A6: Daily Emissions (Case-in-place) - Alternative 1

SHB 1. Site Preparation-Clearing, Grubbing & Earthwork

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
Pick Up	0.581	0.060	0.060	0.001	0.005	4.987	0.003	1.057
Haul Truck	2.016	2.237	0.279	0.003	0.081	3.989	0.069	0.846
Worker commute	1.550	0.161	0.159	0.002	0.014	0.000	0.009	0.000
Total	7.341	8.239	1.384	0.011	0.547	8.976	0.493	1.903

SHB 1. Site Preparation-Clearing, Grubbing & Earthwork

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.1943	5.7812	0.8869	0.0062	0.4472	0.0000	0.4114	0.0000
Pick Up	0.5811	0.0603	0.0595	0.0006	0.0052	2.7427	0.0032	0.5814
Haul Truck	2.0161	2.2366	0.2789	0.0027	0.0805	2.1941	0.0692	0.4652
Worker commute	1.5497	0.1608	0.1588	0.0017	0.0138	0.0000	0.0086	0.0000
Total	7.3412	8.2390	1.3841	0.0112	0.5467	4.9368	0.4925	1.0466

SHB 2. Shaft and Columns - Drilled Shaft Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
200 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Caisson Drill	4.160	9.830	0.929	0.014	0.432	0.000	0.398	0.000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Concrete Truck	6.451	7.157	0.892	0.009	0.258	9.973	0.222	2.114
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.000	0.030	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.017	0.000	0.003
Soil loading	0.000	0.000	0.000	0.000	0.000	0.020	0.000	0.004
Total	55.106	109.495	13.461	0.123	4.993	61.871	4.549	13.116

SHB 2. Shaft and Columns - Drilled Shaft Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
200 ton crane	4.564	12.235	1.347	0.011	0.542	0.0000	0.4990	0.0000
Caisson Drill	4.160	9.830	0.929	0.014	0.432	0.0000	0.3979	0.0000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.0000	0.4990	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.0000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.5824	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.9413	0.0162	4.6516
Concrete Truck	6.451	7.157	0.892	0.009	0.258	5.4853	0.2215	1.1629
Concrete Pump Tru	6.344	20.404	2.077	0.021	0.743	0.0000	0.6837	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.0000	0.8045	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.0000	0.6837	0.0000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.0000	0.0302	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.0054	0.0000	0.0011
Soil loading	0.000	0.000	0.000	0.000	0.000	0.0062	0.0000	0.0013
Total	55.106	109.495	13.461	0.123	4.993	34.021	4.549	7.212

Appendix A:

Table A6: Daily Emissions (Case-in-place) - Alternative 1 (continued)

SHB 3. Shaft and Columns - Footing Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.144	5.398	0.816	0.006	0.416	0.000	0.383	0.000
140 ton crane	4.345	11.612	1.275	0.011	0.514	0.000	0.473	0.000
Generator	2.634	5.152	0.769	0.006	0.317	0.000	0.292	0.000
Haul Truck	7.375	8.250	1.036	0.011	0.300	15.957	0.257	3.383
Pick Up	1.239	0.138	0.137	0.002	0.013	19.947	0.008	4.229
Concrete Truck	11.800	13.200	1.657	0.017	0.481	19.947	0.411	4.229
Concrete Pump Truck	11.886	38.216	3.968	0.043	1.400	0.000	1.288	0.000
Compressor	2.890	5.856	0.896	0.006	0.421	0.000	0.387	0.000
Water Truck	5.943	19.108	1.984	0.021	0.700	0.000	0.644	0.000
Worker commute	2.314	0.257	0.256	0.003	0.024	0.000	0.015	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.036	0.000	0.007
Soil loading	0.000	0.000	0.000	0.000	0.000	0.126	0.000	0.026
Total	53.571	107.187	12.795	0.125	4.587	56.013	4.159	11.874

SHB 3. Shaft and Columns - Footing Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.144	5.398	0.816	0.006	0.416	0.0000	0.3831	0.0000
140 ton crane	4.345	11.612	1.275	0.011	0.514	0.0000	0.4726	0.0000
Generator	2.634	5.152	0.769	0.006	0.317	0.0000	0.2917	0.0000
Haul Truck	7.375	8.250	1.036	0.011	0.300	8.7765	0.2569	1.8606
Pick Up	1.239	0.138	0.137	0.002	0.013	10.9707	0.0082	2.3258
Concrete Truck	11.800	13.200	1.657	0.017	0.481	10.9707	0.4111	2.3258
Concrete Pump Tru	11.886	38.216	3.968	0.043	1.400	0.0000	1.2881	0.0000
Compressor	2.890	5.856	0.896	0.006	0.421	0.0000	0.3874	0.0000
Water Truck	5.943	19.108	1.984	0.021	0.700	0.0000	0.6441	0.0000
Worker commute	2.314	0.257	0.256	0.003	0.024	0.0000	0.0153	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.0115	0.0000	0.0024
Soil loading	0.000	0.000	0.000	0.000	0.000	0.0403	0.0000	0.0084
Total	53.571	107.187	12.795	0.125	4.587	30.770	4.159	6.523

SHB 4. Shaft and Columns - Column Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.305	0.000
Flatbed	1.512	1.677	0.209	0.002	0.060	5.984	0.052	1.269
Pick Up	1.453	0.151	0.149	0.002	0.013	19.947	0.008	4.229
Concrete Truck	4.516	5.010	0.625	0.006	0.180	6.981	0.155	1.480
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.015	0.000
Total	26.764	51.264	6.444	0.056	2.332	32.912	2.120	6.977

SHB 4. Shaft and Columns - Column Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.3046	0.0000
Flatbed	1.512	1.677	0.209	0.002	0.060	3.291	0.0519	0.6977
Pick Up	1.453	0.151	0.149	0.002	0.013	10.971	0.0081	2.3258
Concrete Truck	4.516	5.010	0.625	0.006	0.180	3.840	0.1551	0.8140
Concrete Pump Tru	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.4022	0.0000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.0151	0.0000
Total	26.764	51.264	6.444	0.056	2.332	18.102	2.120	3.838

Appendix A:

Table A6: Daily Emissions (Case-in-place) - Alternative 1 (continued)

SHB 5. Falsework

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.998	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Rough Terrain (f - lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.115	0.000
Scissor Lift	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Boom	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Semi Truck	2.564	8.369	0.659	0.008	0.399	372.218	0.350	78.910
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Tug boat	47.028	189.413	7.146	0.128	4.928	0.000	4.534	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Total	117.315	322.900	25.096	0.273	12.847	424.079	11.773	89.905

SHB 5. Falsework

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.9980	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Rough Terrain (f - li	15.408	27.216	4.377	0.026	2.299	0.000	2.1153	0.0000
Scissor Lift	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.8045	0.0000
Boom	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Semi Truck	2.564	8.369	0.659	0.008	0.399	204.720	0.3505	43.4006
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Tug boat	47.028	189.413	7.146	0.128	4.928	0.000	4.5337	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.0323	0.0000
Total	117.315	322.900	25.096	0.273	12.847	233.244	11.773	49.448

SHB 6. superstructure - Approach Span Erection

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Rough Terrain (f-lift)	7.704	13.608	2.188	0.013	1.150	0.000	1.058	0.000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.219	0.000
Semi Truck	2.154	7.030	0.553	0.007	0.335	14.889	0.294	3.156
Flatbed	9.072	10.065	1.255	0.012	0.362	35.904	0.312	7.612
Pick Up	7.264	0.754	0.744	0.008	0.065	99.733	0.040	21.143
Concrete Truck	12.903	14.314	1.785	0.017	0.516	19.947	0.443	4.229
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.609	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.891	0.000	0.185
Grading	0.000	0.000	0.000	0.000	0.000	2.640	0.000	0.549
Soil loading	0.000	0.000	0.000	0.000	0.000	3.120	0.000	0.649
Total	89.374	157.675	21.008	0.173	8.123	177.124	7.372	37.524

SHB 6. superstructure - Approach Span Erection

0

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Rough Terrain (f-lift	7.704	13.608	2.188	0.013	1.150	0.000	1.0576	0.0000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.2185	0.0000
Semi Truck	2.154	7.030	0.553	0.007	0.335	8.189	0.2944	1.7360
Flatbed	9.072	10.065	1.255	0.012	0.362	19.747	0.3115	4.1864
Pick Up	7.264	0.754	0.744	0.008	0.065	54.853	0.0404	11.6289
Concrete Truck	12.903	14.314	1.785	0.017	0.516	10.971	0.4431	2.3258
Concrete Pump Tru	12.689	40.808	4.155	0.043	1.486	0.000	1.3674	0.0000
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.6090	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.0323	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.285	0.0000	0.0593
Grading	0.000	0.000	0.000	0.000	0.000	0.845	0.0000	0.1757
Soil loading	0.000	0.000	0.000	0.000	0.000	0.998	0.0000	0.2077
Total	89.374	157.675	21.008	0.173	8.123	95.888	7.372	20.320

Appendix A:

Table A6: Daily Emissions (Case-in-place) - Alternative 1 (continued)

SHB 7. superstructure - Main Span Erection

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.998	0.000
Rough Terrain (f-lift)	7.704	13.608	2.188	0.013	1.150	0.000	1.058	0.000
140 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.998	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Semi Truck	2.154	7.030	0.553	0.007	0.335	14.889	0.294	3.156
Flatbed	7.560	8.387	1.046	0.010	0.302	29.920	0.260	6.343
Pick Up	7.264	0.754	0.744	0.008	0.065	99.733	0.040	21.143
Concrete Truck	12.903	14.314	1.785	0.017	0.516	19.947	0.443	4.229
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.081	0.000	0.017
Grading	0.000	0.000	0.000	0.000	0.000	1.320	0.000	0.275
Soil loading	0.000	0.000	0.000	0.000	0.000	0.085	0.000	0.018
Total	85.667	157.456	19.973	0.171	7.611	165.974	6.905	35.181

SHB 7. superstructure - Main Span Erection

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.9980	0.0000
Rough Terrain (f-lift	7.704	13.608	2.188	0.013	1.150	0.000	1.0576	0.0000
140 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.9980	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Semi Truck	2.154	7.030	0.553	0.007	0.335	8.189	0.2944	1.7360
Flatbed	7.560	8.387	1.046	0.010	0.302	16.456	0.2596	3.4887
Pick Up	7.264	0.754	0.744	0.008	0.065	54.853	0.0404	11.6289
Concrete Truck	12.903	14.314	1.785	0.017	0.516	10.971	0.4431	2.3258
Concrete Pump Tru	12.689	40.808	4.155	0.043	1.486	0.000	1.3674	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.8045	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.0323	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.026	0.0000	0.0054
Grading	0.000	0.000	0.000	0.000	0.000	0.422	0.0000	0.0879
Soil loading	0.000	0.000	0.000	0.000	0.000	0.027	0.0000	0.0057
Total	85.667	157.456	19.973	0.171	7.611	90.944	6.905	19.278

SHB 8. Bridge Demolition (including both approaches)

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	4.359	0.452	0.447	0.005	0.039	59.840	0.024	12.686
Haul Truck	20.161	22.366	2.789	0.027	0.805	39.893	0.692	8.457
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.609	0.000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.219	0.000
Flatbed	6.048	6.710	0.837	0.008	0.242	23.936	0.208	5.074
Backhoe/excavator	12.777	23.125	3.547	0.025	1.789	0.000	1.646	0.000
Loader	9.583	17.344	2.661	0.019	1.342	0.000	1.234	0.000
Worker commute	6.199	0.643	0.635	0.007	0.055	0.000	0.034	0.000
Demolition	0.000	0.000	0.000	0.000	0.000	0.164	0.000	0.034
Excavation	0.000	0.000	0.000	0.000	0.000	0.282	0.000	0.059
Grading	0.000	0.000	0.000	0.000	0.000	2.640	0.000	0.549
Soil loading	0.000	0.000	0.000	0.000	0.000	0.592	0.000	0.123
Total	81.775	116.663	17.954	0.135	7.345	127.348	6.666	26.983

SHB 8. Bridge Demolition (including both approaches)

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	4.359	0.452	0.447	0.005	0.039	32.912	0.0242	6.9773
Haul Truck	20.161	22.366	2.789	0.027	0.805	21.941	0.6923	4.6516
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.6090	0.0000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.2185	0.0000
Flatbed	6.048	6.710	0.837	0.008	0.242	13.165	0.2077	2.7909
Backhoe/excavator	12.777	23.125	3.547	0.025	1.789	0.000	1.6457	0.0000
Loader	9.583	17.344	2.661	0.019	1.342	0.000	1.2343	0.0000
Worker commute	6.199	0.643	0.635	0.007	0.055	0.000	0.0345	0.0000
Demolition	0.000	0.000	0.000	0.000	0.000	0.053	0.0000	0.0109
Excavation	0.000	0.000	0.000	0.000	0.000	0.090	0.0000	0.0188
Grading	0.000	0.000	0.000	0.000	0.000	0.845	0.0000	0.1757
Soil loading	0.000	0.000	0.000	0.000	0.000	0.190	0.0000	0.0394
Total	81.775	116.663	17.954	0.135	7.345	69.195	6.666	14.665

Appendix A:

Table A6: Daily Emissions (Case-in-place) - Alternative 1 (continued)

SHB 9. Barriers and Joints

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	0.484	0.050	0.050	0.001	0.004	5.984	0.003	1.269
Concrete Trucks	2.581	2.863	0.357	0.003	0.103	3.989	0.089	0.846
Flatbed Truck	0.806	0.895	0.112	0.001	0.032	3.989	0.028	0.846
Semi Truck	0.539	1.758	0.138	0.002	0.084	3.722	0.074	0.789
Worker commute	2.325	0.241	0.238	0.003	0.021	0.000	0.013	0.000
Total	6.734	5.807	0.895	0.009	0.244	17.685	0.206	3.749

SHB 9. Barriers and Joints

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	0.484	0.050	0.050	0.001	0.004	3.291	0.0027	0.6977
Concrete Trucks	2.581	2.863	0.357	0.003	0.103	2.194	0.0886	0.4652
Flatbed Truck	0.806	0.895	0.112	0.001	0.032	2.194	0.0277	0.4652
Semi Truck	0.539	1.758	0.138	0.002	0.084	2.047	0.0736	0.4340
Worker commute	2.325	0.241	0.238	0.003	0.021	0.000	0.0129	0.0000
Total	6.734	5.807	0.895	0.009	0.244	9.727	0.206	2.062

SHB 10. Stripping, Lighting, and Signing

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Paint truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Bucket Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Semi Truck	1.077	3.515	0.277	0.003	0.168	7.444	0.147	1.578
Boom Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	3.874	0.402	0.397	0.004	0.034	0.000	0.022	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.247	0.000	0.051
Total	36.194	91.966	10.225	0.102	3.638	47.585	3.322	10.087

SHB 10. Stripping, Lighting, and Signing

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Paint truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.4022	0.0000
Bucket Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.3674	0.0000
Semi Truck	1.077	3.515	0.277	0.003	0.168	4.094	0.1472	0.8680
Boom Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Worker commute	3.874	0.402	0.397	0.004	0.034	0.000	0.0215	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.079	0.0000	0.0165
Total	36.194	91.966	10.225	0.102	3.638	26.115	3.322	5.536

Appendix A:

Table A6: Daily Emissions (Case-in-place) - Alternative 1 (continued)

SR-47 1. Site Preparation - Earthwork

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Haulers (Truck)	12.096	13.420	1.673	0.016	0.483	23.936	0.415	5.074
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	4.359	0.452	0.447	0.005	0.039	59.840	0.024	12.686
Grader	10.285	24.380	2.920	0.024	1.273	0.000	1.171	0.000
Vibratory loader	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Asphalt Paver	4.605	8.257	1.494	0.007	0.591	0.000	0.544	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Total	77.015	128.570	18.466	0.143	7.522	95.744	6.857	20.298

SR-47 1. Site Preparation - Earthwork

0

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Haulers (Truck)	12.096	13.420	1.673	0.016	0.483	13.165	0.4154	2.7909
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	4.359	0.452	0.447	0.005	0.039	32.912	0.0242	6.9773
Grader	10.285	24.380	2.920	0.024	1.273	0.000	1.1714	0.0000
Vibratory loader	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Asphalt Paver	4.605	8.257	1.494	0.007	0.591	0.000	0.5437	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.8045	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.0323	0.0000
Total	77.015	128.570	18.466	0.143	7.522	52.659	6.857	11.164

SR-47 2. Site Preparation - Drilled Shaft Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
200 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Caisson Drill	4.160	9.830	0.929	0.014	0.432	0.000	0.398	0.000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Concrete Truck	6.451	7.157	0.892	0.009	0.258	9.973	0.222	2.114
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.000	0.030	0.000
Demolition	0.000	0.000	0.000	0.000	0.000	0.095	0.000	0.020
Excavation	0.000	0.000	0.000	0.000	0.000	0.114	0.000	0.024
Grading	0.000	0.000	0.000	0.000	0.000	2.640	0.000	0.549
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.083	0.000	0.017
Total	52.147	103.364	12.517	0.117	4.556	64.767	4.146	13.719

SR-47 2. Site Preparation - Drilled Shaft Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
200 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Caisson Drill	4.160	9.830	0.929	0.014	0.432	0.000	0.3979	0.0000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Concrete Truck	6.451	7.157	0.892	0.009	0.258	5.485	0.2215	1.1629
Concrete Pump Tru	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.4022	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.000	0.0302	0.0000
Demolition	0.000	0.000	0.000	0.000	0.000	0.030	0.0000	0.0063
Excavation	0.000	0.000	0.000	0.000	0.000	0.036	0.0000	0.0076
Grading	0.000	0.000	0.000	0.000	0.000	0.845	0.0000	0.1757
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.027	0.0000	0.0055
Total	52.147	103.364	12.517	0.117	4.556	34.947	4.146	7.405

Appendix A:

Table A6: Daily Emissions (Case-in-place) - Alternative 1 (continued)

SR-47 3. Foundation Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.305	0.000
Haul Truck	8.064	8.947	1.116	0.011	0.322	15.957	0.277	3.383
Pick Up	2.179	0.226	0.223	0.002	0.019	29.920	0.012	6.343
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.995	0.044	0.423
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Pile Driver	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.015	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.034	0.000	0.007
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.024	0.000	0.005
Total	47.221	98.515	11.752	0.109	4.415	47.930	4.026	10.161

SR-47 3. Foundation Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.194	5.781	0.887	0.006	0.447	0.000	0.4114	0.0000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.3046	0.0000
Haul Truck	8.064	8.947	1.116	0.011	0.322	8.777	0.2769	1.8606
Pick Up	2.179	0.226	0.223	0.002	0.019	16.456	0.0121	3.4887
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.097	0.0443	0.2326
Concrete Pump Tru	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.4022	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Pile Driver	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.0151	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.011	0.0000	0.0023
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.008	0.0000	0.0016
Total	47.221	98.515	11.752	0.109	4.415	26.348	4.026	5.586

SR-47 4. Column Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.305	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Concrete Truck	2.581	2.863	0.357	0.003	0.103	3.989	0.089	0.846
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.015	0.000
Total	27.793	50.945	6.535	0.057	2.328	55.851	2.113	11.840

SR-47 4. Column Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.3046	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Concrete Truck	2.581	2.863	0.357	0.003	0.103	2.194	0.0886	0.4652
Concrete Pump Tru	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.4022	0.0000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.0151	0.0000
Total	27.793	50.945	6.535	0.057	2.328	30.718	2.113	6.512

Appendix A:

Table A6: Daily Emissions (Case-in-place) - Alternative 1 (continued)

SR-47 5. Falsework

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
100 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Rough Terrain (f - lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.115	0.000
Scissor Lift	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Boom	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Total	56.770	101.321	14.171	0.114	6.083	51.861	5.567	10.995

SR-47 5. Falsework

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
100 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Rough Terrain (f - li	15.408	27.216	4.377	0.026	2.299	0.000	2.1153	0.0000
Scissor Lift	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.8045	0.0000
Boom	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.0323	0.0000
Total	56.770	101.321	14.171	0.114	6.083	28.524	5.567	6.047

SR-47 6. Superstructure - Span Erection

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Rough Terrain (f-lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.115	0.000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.219	0.000
Semi Truck	2.154	7.030	0.553	0.007	0.335	14.889	0.294	3.156
Flatbed	6.048	6.710	0.837	0.008	0.242	23.936	0.208	5.074
Pick Up	7.264	0.754	0.744	0.008	0.065	99.733	0.040	21.143
Concrete Truck	15.483	17.177	2.142	0.021	0.619	23.936	0.532	5.074
Concrete Pump Truck	25.378	81.616	8.310	0.085	2.973	0.000	2.735	0.000
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.609	0.000
Worker commute	9.686	1.005	0.992	0.011	0.086	0.000	0.054	0.000
Demolition	0.000	0.000	0.000	0.000	0.000	5.040	0.000	1.048
Excavation	0.000	0.000	0.000	0.000	0.000	0.504	0.000	0.105
grading	0.000	0.000	0.000	0.000	0.000	7.920	0.000	1.647
paving	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	113.198	212.001	27.687	0.232	10.776	175.958	9.804	37.249

SR-47 6. Superstructure - Span Erection

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Rough Terrain (f-lift	15.408	27.216	4.377	0.026	2.299	0.000	2.1153	0.0000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.2185	0.0000
Semi Truck	2.154	7.030	0.553	0.007	0.335	8.189	0.2944	1.7360
Flatbed	6.048	6.710	0.837	0.008	0.242	13.165	0.2077	2.7909
Pick Up	7.264	0.754	0.744	0.008	0.065	54.853	0.0404	11.6289
Concrete Truck	15.483	17.177	2.142	0.021	0.619	13.165	0.5317	2.7909
Concrete Pump Tru	25.378	81.616	8.310	0.085	2.973	0.000	2.7348	0.0000
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.6090	0.0000
Worker commute	9.686	1.005	0.992	0.011	0.086	0.000	0.0538	0.0000
Demolition	0.000	0.000	0.000	0.000	0.000	1.613	0.0000	0.3355
Excavation	0.000	0.000	0.000	0.000	0.000	0.161	0.0000	0.0335
grading	0.000	0.000	0.000	0.000	0.000	2.534	0.0000	0.5272
paving	0.000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000
Total	113.198	212.001	27.687	0.232	10.776	93.680	9.804	19.843

Appendix A:

Table A6: Daily Emissions (Case-in-place) - Alternative 1 (continued)

SR-47 7. Drainage
Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
Loader	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
Haulers (Truck)	4.032	4.473	0.558	0.005	0.161	7.979	0.138	1.691
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	6.048	6.710	0.837	0.008	0.242	23.936	0.208	5.074
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Vibratory Roller	6.836	13.065	2.000	0.012	0.918	0.000	0.845	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.995	0.044	0.423
Worker commute	4.649	0.482	0.476	0.005	0.041	0.000	0.026	0.000
Demolition	0.000	0.000	0.000	0.000	0.000	0.277	0.000	0.058
Excavation	0.000	0.000	0.000	0.000	0.000	0.259	0.000	0.054
grading	0.000	0.000	0.000	0.000	0.000	2.640	0.000	0.549
Paving	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Soil dumping	0.000	0.000	0.000	0.000	0.000	0.008	0.000	0.002
Total	49.819	81.442	11.718	0.092	4.614	76.987	4.197	16.308

SR-47 7. Drainage
Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	3.194	5.781	0.887	0.006	0.447	0.000	0.4114	0.0000
Loader	3.194	5.781	0.887	0.006	0.447	0.000	0.4114	0.0000
Haulers (Truck)	4.032	4.473	0.558	0.005	0.161	4.388	0.1385	0.9303
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Flatbed	6.048	6.710	0.837	0.008	0.242	13.165	0.2077	2.7909
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Vibratory Roller	6.836	13.065	2.000	0.012	0.918	0.000	0.8446	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.8045	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.097	0.0443	0.2326
Worker commute	4.649	0.482	0.476	0.005	0.041	0.000	0.0258	0.0000
Demolition	0.000	0.000	0.000	0.000	0.000	0.089	0.0000	0.0185
Excavation	0.000	0.000	0.000	0.000	0.000	0.083	0.0000	0.0172
grading	0.000	0.000	0.000	0.000	0.000	0.845	0.0000	0.1757
Paving	0.000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000
Soil dumping	0.000	0.000	0.000	0.000	0.000	0.003	0.0000	0.0005
Total	49.819	81.442	11.718	0.092	4.614	41.610	4.197	8.817

SR-47 8. Retaining Walls and Soundwalls - - MSE Walls at Ramps and Touchdowns
Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Haulers (Truck)	8.064	8.947	1.116	0.011	0.322	15.957	0.277	3.383
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.305	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	1.453	0.151	0.149	0.002	0.013	19.947	0.008	4.229
Vibratory Roller	6.836	13.065	2.000	0.012	0.918	0.000	0.845	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Concrete Truck	2.581	2.863	0.357	0.003	0.103	3.989	0.089	0.846
Worker commute	4.262	0.442	0.437	0.005	0.038	0.000	0.024	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	1.050	0.000	0.218
Grading	0.000	0.000	0.000	0.000	0.000	5.280	0.000	1.098
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.919	0.000	0.191
Total	51.003	83.857	11.861	0.094	4.815	59.110	4.382	12.502

SR-47 8. Retaining Walls and Soundwalls - - MSE Walls at Ramps and Touchdowns
Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Haulers (Truck)	8.064	8.947	1.116	0.011	0.322	8.777	0.2769	1.8606
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.3046	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	1.453	0.151	0.149	0.002	0.013	10.971	0.0081	2.3258
Vibratory Roller	6.836	13.065	2.000	0.012	0.918	0.000	0.8446	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.4022	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Concrete Truck	2.581	2.863	0.357	0.003	0.103	2.194	0.0886	0.4652
Worker commute	4.262	0.442	0.437	0.005	0.038	0.000	0.0237	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.336	0.0000	0.0699
Grading	0.000	0.000	0.000	0.000	0.000	1.690	0.0000	0.3514
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.294	0.0000	0.0612
Total	51.003	83.857	11.861	0.094	4.815	30.843	4.382	6.530

Appendix A:

Table A6: Daily Emissions (Case-in-place) - Alternative 1 (continued)

SR-47 9. Striping, Lighting and Signing
Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Boom	13.732	34.599	3.617	0.041	1.507	0.000	1.386	0.000
Loader	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
Generator	8.108	16.124	2.448	0.017	0.993	0.000	0.914	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	4.359	0.452	0.447	0.005	0.039	59.840	0.024	12.686
Compressor	8.878	18.393	2.831	0.017	1.312	0.000	1.207	0.000
Striper (Truck)	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	4.649	0.482	0.476	0.005	0.041	0.000	0.026	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.412	0.000	0.086
Total	52.289	99.591	13.202	0.116	5.203	72.220	4.756	15.309

SR-47 9. Striping, Lighting and Signing
Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Boom	13.732	34.599	3.617	0.041	1.507	0.000	1.3863	0.0000
Loader	3.194	5.781	0.887	0.006	0.447	0.000	0.4114	0.0000
Generator	8.108	16.124	2.448	0.017	0.993	0.000	0.9139	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	4.359	0.452	0.447	0.005	0.039	32.912	0.0242	6.9773
Compressor	8.878	18.393	2.831	0.017	1.312	0.000	1.2067	0.0000
Striper (Truck)	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Worker commute	4.649	0.482	0.476	0.005	0.041	0.000	0.0258	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.132	0.0000	0.0274
Total	52.289	99.591	13.202	0.116	5.203	39.626	4.756	8.400

SHB and SR-47: Stockpile Area
Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Stock piles	0.000	0.000	0.000	0.000	0.000	79.8	0.0	16.6

SHB and SR-47: Stockpile Area
Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times

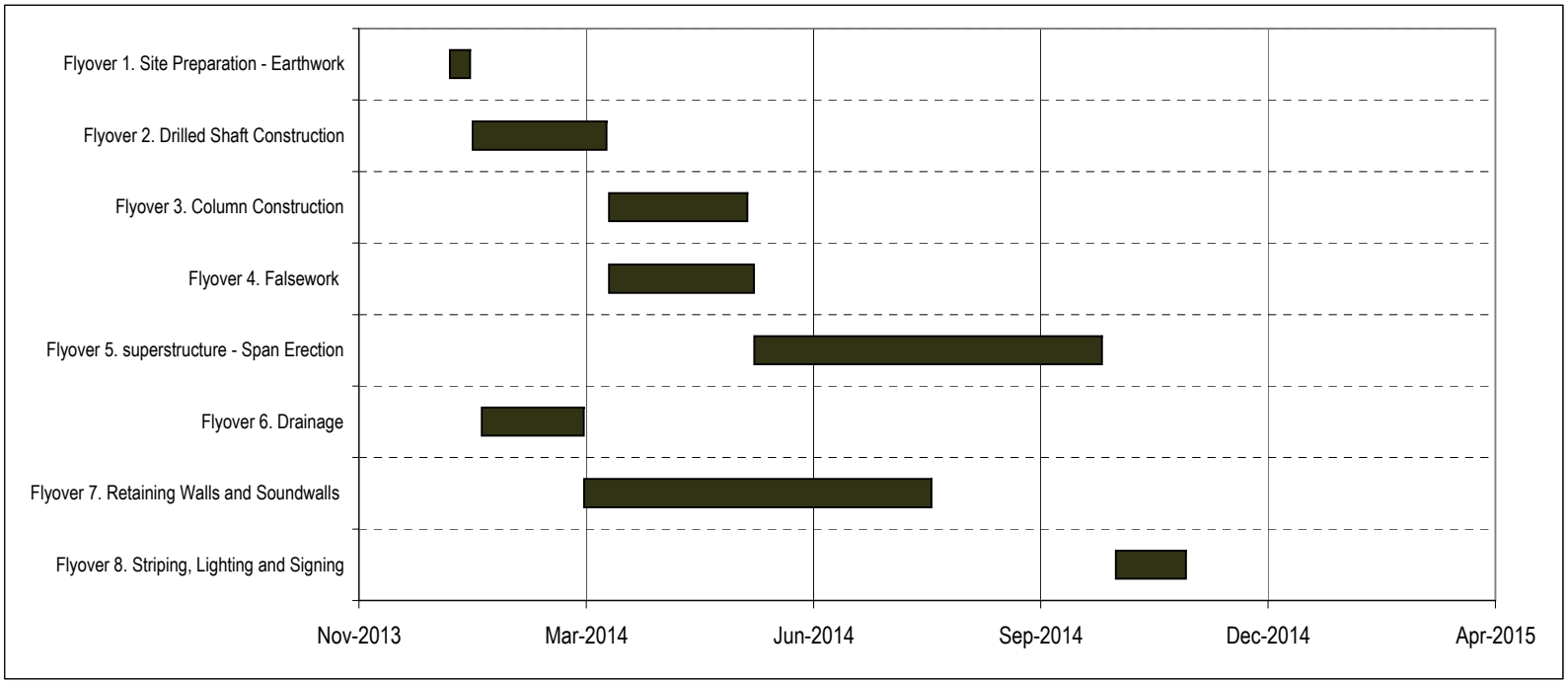
	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Stock piles	0.000	0.000	0.000	0.000	0.000	25.541	0.0000	5.3125

Note:
Stock pile areas were not specified or calculated for each construction phases. The maximum areas that might be covered each day by the whole project was used to calculate the total fugitive dust emissions from stock piles.

Appendix A1
Construction Emission Calculations – Flyover

Appendix A1:

Table A1-1: Construction Schedule - Flyover



Source: DMJM Harris, May 2007

Appendix A1:

Table A1-2: Maximum Construction Emissions: By Source - Flyover

Maximum Daily Construction Emissions

		CO (lb/day)	NOx (lb/day)	ROG (lb/day)	SOx (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
With Mitigation to Control Fugitive Dust	Maximum Construction Equipment Exhaust	141	232	32	0.4	12	11
	Maximum Workers Commute	8.5	0.8	0.9	0.014	0.12	0.08
	Maximum Fugitive Dust	NA	NA	NA	NA	64	13
	Maximum Combined Daily Emissions	**149**	**233**	**33**	**0.4**	**77**	**25**

Note:

1. The maximum daily emissions from equipment exhaust, fugitive dust, and workers commute are not additive because these worst case emissions do not always occur on the same day.

Appendix A1:
Table A1-3. Summary of Daily Emissions

by Construction Phase

		Total Emissions without Watering (lb/day)									
Construction Phases		**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**PM_{10} Fugitive**	**PM_{10} Total**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ Fugitive**	**$PM_{2.5}$ Total**
20	Flyover 1. Site Preparation - Earthwork	11.34	18.12	2.59	0.03	0.80	9.97	10.77	0.72	2.11	2.84
21	Flyover 2. Drilled Shaft Construction	43.65	72.98	9.52	0.13	3.19	29.96	33.16	2.89	6.35	9.24
22	Flyover 3. Column Construction	27.39	45.09	6.25	0.07	2.21	21.94	24.15	2.00	4.65	6.65
23	Flyover 4. Falsework	59.33	102.79	14.11	0.15	5.63	15.96	21.58	5.16	3.38	8.54
24	Flyover 5. superstructure - Span Erection	72.36	117.94	16.14	0.18	6.28	57.51	63.79	5.69	12.19	17.88
25	Flyover 6. Drainage	25.44	41.89	5.95	0.06	2.30	7.38	9.67	2.10	1.56	3.65
26	Flyover 7. Retaining Walls and Soundwalls	62.50	84.94	12.27	0.14	4.72	35.60	40.33	4.26	7.52	11.77
27	Flyover 8. Striping, Lighting and Signing	15.50	26.74	3.74	0.04	1.34	0.11	1.46	1.23	0.02	1.25
	Stock Piles (entire project)	0.00	0.00	0.00	0.00	0.00	79.82	79.82	0.00	16.60	16.60
	Overlapping phases										
	20	11	18	2.6	0.03	0.8	90	91	0.7	19	19
	21,25,	69	115	15	0.19	5.5	117	123	5.0	25	29
	22,23,26,	149	233	33	0.37	12.6	153	166	11.4	32	44
	27,	16	27	3.7	0.04	1.3	80	81	1.2	17	18
	Max. Daily Emissions	**149**	**233**	**33**	**0.37**	**13**	**153**	**166**	**11**	**32**	**44**

Note:

1. Based on the construction schedule, emissions from overlapping construction phases were added together to evaluate the worst case scenarios.

The maximum daily emissions represent the scenario of overlapping phases with the highest emissions.

2. Fugitive dust emissions from stock piles were not calculated for each construction phase. The emissions were calculated separately based on a maximum

area that the stock piles will cover during the entire construction duration.

3. The fugitive dusts were assumed to be controlled by 68% by watering the site 3 times per day, and 45% by watering the unpaved roads 3 times a day,

according to the control efficiencies in SCAQMD CEQA Air Quality Handbook Table 11-4.

4. $PM_{2.5}$ emissions were calculated using the updated CEIDARS PM2.5 fractions In Appendix A of the *Final $PM_{2.5}$ Calculation Methodology and $PM_{2.5}$*

Significance Thresholds (SCAQMD, 2006) as following:

Appendix A1:
Table A1-3. Summary of Daily Emissions

by Construction Phase

		Total Emissions with Watering (lb/day)									
Construction Phases		**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**PM_{10} Fugitive**	**PM_{10} Total**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ Fugitive**	**$PM_{2.5}$ Total**
20	Flyover 1. Site Preparation - Earthwork	11.34	18.12	2.59	0.03	0.80	5.49	6.28	0.72	1.16	1.88
21	Flyover 2. Drilled Shaft Construction	43.65	72.98	9.52	0.13	3.19	16.24	19.43	2.89	3.44	6.33
22	Flyover 3. Column Construction	27.39	45.09	6.25	0.07	2.21	12.07	14.27	2.00	2.56	4.55
23	Flyover 4. Falsework	59.33	102.79	14.11	0.15	5.63	8.78	14.40	5.16	1.86	7.02
24	Flyover 5. superstructure - Span Erection	72.36	117.94	16.14	0.18	6.28	31.63	37.91	5.69	6.71	12.40
25	Flyover 6. Drainage	25.44	41.89	5.95	0.06	2.30	3.59	5.88	2.10	0.76	2.85
26	Flyover 7. Retaining Walls and Soundwalls	62.50	84.94	12.27	0.14	4.72	17.70	22.43	4.26	3.74	8.00
27	Flyover 8. Striping, Lighting and Signing	15.50	26.74	3.74	0.04	1.34	0.04	1.38	1.23	0.01	1.23
	Stock Piles (entire project)	0.00	0.00	0.00	0.00	0.00	25.54	25.54	0.00	5.31	5.31
	Overlapping phases										
	20	11	18	2.6	0.03	0.8	31	32	0.7	6	7.2
	21,25,	69	115	15	0.19	5.5	45	51	5.0	10	15
	22,23,26,	149	233	33	0.37	13	64	77	11	13	25
	27,	16	27	3.7	0.04	1.3	26	27	1.2	5.3	6.5
	Max. Daily Emissions	**149**	**233**	**33**	**0.37**	**13**	**64**	**77**	**11**	**13**	**25**

Appendix A1:
Table A1-3. Summary of Daily Emissions

by Construction Phase

		Construction Equipment Exhaust						Workers Commute					
Construction Phases		**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**$PM_{2.5}$ Exhaust**	**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**$PM_{2.5}$ Exhaust**
20	Flyover 1. Site Preparation - Earthwork	9.75	17.96	2.43	0.03	0.78	0.71	1.585	0.157	0.169	0.003	0.022	0.014
21	Flyover 2. Drilled Shaft Construction	41.01	72.72	9.24	0.12	3.16	2.87	2.641	0.262	0.281	0.004	0.037	0.024
22	Flyover 3. Column Construction	24.75	44.83	5.97	0.07	2.17	1.97	2.641	0.262	0.281	0.004	0.037	0.024
23	Flyover 4. Falsework	56.69	102.53	13.83	0.15	5.59	5.13	2.641	0.262	0.281	0.004	0.037	0.024
24	Flyover 5. superstructure - Span Erection	69.19	117.62	15.80	0.18	6.24	5.66	3.170	0.314	0.337	0.005	0.044	0.029
25	Flyover 6. Drainage	24.12	41.76	5.81	0.06	2.28	2.08	1.321	0.131	0.140	0.002	0.018	0.012
26	Flyover 7. Retaining Walls and Soundwalls	59.33	84.62	11.93	0.14	4.68	4.23	3.170	0.314	0.337	0.005	0.044	0.029
27	Flyover 8. Striping, Lighting and Signing	13.92	26.58	3.58	0.04	1.32	1.21	1.585	0.157	0.169	0.003	0.022	0.014
	Stock Piles (entire project)	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000
	Overlapping phases												
	20	10	18	2.4	0.03	0.8	0.7	1.6	0.2	0.2	0.003	0.02	0.01
	21,25,	65	114	15	0.19	5.4	5.0	4.0	0.4	0.4	0.006	0.06	0.04
	22,23,26,	141	232	32	0.35	12	11	8.5	0.8	0.9	0.014	0.12	0.08
	27,	14	27	4	0.04	1.3	1.2	1.6	0.2	0.2	0.003	0.02	0.01
	Max. Daily Emissions	**141**	**232**	**32**	**0.4**	**12**	**11**	**8.5**	**0.84**	**0.90**	**0.014**	**0.12**	**0.08**

Appendix A1:

Table A1-4: Construction Equipment Usage - Flyover

Flyover Constructions

Flyover 1. Site Preparation - Earthwork

Construction duration from 1/1/2014 to 1/10/2014
Number of construction Workers 6 Round trip distance per Worker 40

	All Equipment							Per Truck		
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**
Backhoe	NA	1	0.3	8	7	56	8	NA	NA	NA
Haulers (Truck)	NA	1	0.1	3	7	21	NA	40	1	38
Pick Up	NA	2	0.3	8	4	64	NA	50	2	96
Water Truck	NA	1	0.3	8	2	16	8	NA	NA	NA
Worker commute	NA	6	NA	NA	NA	NA	NA	40	1	40

Flyover 2. Shaft and Columns - Drilled Shaft Construction

Construction duration from 1/11/2014 to 3/11/2014
Number of construction Workers 10 Round trip distance per Worker 40

	All Equipment							Per Truck		
Equipment Description	**HP rating**	**Units**	**CIDH**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per CIDH**	**per CIDH**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**
Caisson Drill	NA	2	11	0.5	3.5	38.5	8	NA	NA	NA
140 ton crane	NA	1	11	1	6	66	8	NA	NA	NA
Generator	NA	2	11	3.5	24.5	1886.5	8	NA	NA	NA
Flatbed	NA	2	11	3.5	21	1617	NA	50	1.25	58.5
Pick Up	NA	4	11	3.5	21	3234	NA	50	1.25	58.5
Concrete Truck	NA	10	11	0.8	3.2	281.6	NA	32	1.5	47.5
Concrete Pump Truck	NA	1	11	0.5	4	22	8	NA	NA	NA
Compressor	NA	2	11	3.5	28	2156	8	NA	NA	NA
Water Truck	NA	1	11	3.5	21	808.5	8	NA	NA	NA
Worker commute	NA	10	NA	NA	NA	NA	NA	40	1	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	11000	550	ft^3	20
Soil loading	204	20.4	yd^3	10.0

Flyover 3. Shaft and Columns - Column Construction

Construction duration from 3/12/2014 to 5/12/2014
Number of construction Workers 10 Round trip distance per Worker 40

	All Equipment							Per Truck		
Equipment Description	**HP rating**	**Units**	**Columns**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per Col.**	**per Col.**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**
140 ton crane	NA	1	11	1	7	77	8	NA	NA	NA
Generator	NA	2	11	2.5	20	1100	8	NA	NA	NA
Flatbed	NA	2	11	2.5	15	825	NA	50	1.25	58.5
Pick Up	NA	3	11	2.5	15	1237.5	NA	50	1.25	58.5
Concrete Truck	NA	4	11	1	4	176	NA	32	2	63.5
Concrete Pump Truck	NA	1	11	1	8	88	8	NA	NA	NA
Compressor	NA	2	11	2.5	20	1100	8	NA	NA	NA
Worker commute	NA	10	NA	NA	NA	NA	NA	40	1	40

Appendix A1:

Table A1-4: Construction Equipment Usage - Flyover (continued)

Flyover 4. Falsework

Construction duration from 3/12/2014 to 5/15/2014

Number of construction Workers 10 Round trip distance per Worker 40

	All Equipment							Per Truck		
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**
100 ton crane	NA	1	0.5	10	60	60	8	NA	NA	NA
Generator	NA	4	0.75	15	105	420	8	NA	NA	NA
Flatbed	NA	2	0.75	15	90	180	NA	50	1.25	58.5
Pick Up	NA	2	0.75	15	90	180	NA	50	1.25	58.5
Rough Terrain (f - lift)	NA	4	0.75	15	105	420	8	NA	NA	NA
Scissor Lift	NA	2	0.5	10	40	80	8	NA	NA	NA
Compressor	NA	4	0.75	15	105	420	8	NA	NA	NA
Boom Truck	NA	2	0.5	10	60	120	8	NA	NA	NA
Worker commute	NA	10	NA	NA	NA	NA	NA	40	1	40

Flyover 5. superstructure - Span Erection

Construction duration from 5/15/2014 to 10/15/2014

Number of construction Workers 12 Round trip distance per Worker 40

	All Equipment							Per Truck		
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**
275 ton crane	NA	1	3	60	420	420	8	NA	NA	NA
Rough Terrain (f-lift)	NA	4	4	80	560	2240	8	NA	NA	NA
140 ton crane	NA	1	3	60	420	480	8	NA	NA	NA
Generator	NA	4	4	80	560	2560	8	NA	NA	NA
Semi Truck	NA	5	3	60	120	1200	NA	40	1	39.5
Flatbed	NA	6	4	80	480	2880	NA	50	1.25	58.5
Pick Up	NA	6	4	80	480	2880	NA	50	1.25	58.5
Concrete Truck	NA	10	3	60	240	2400	NA	32	2	63.5
Concrete Pump Truck	NA	2	3	60	480	960	8	NA	NA	NA
Compressor	NA	4	4	80	560	2560	8	NA	NA	NA
Worker commute	NA	12	NA	NA	NA	NA	NA	40	1	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	0	0	ft^3	0
Grading	0	0	acre	0
Soil loading	0	0	yd^3	0

Flyover 6. Drainage

Construction duration from 1/15/2014 to 3/1/2014

Number of construction Workers 5 Round trip distance per Worker 40

	All Equipment							Per Truck		
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**
Backhoe	NA	1	0.5	10	6	60	8	NA	NA	NA
Haulers (Truck)	NA	1	0.2	2	4	8	NA	32	1	31.75
Generator	NA	2	1	20	6	240	8	NA	NA	NA
Flatbed	NA	2	0.75	15	4	120	NA	50	1	49.5
Pick Up	NA	2	1	20	6	240	NA	50	1.25	60.5
Vibratory Roller	NA	1	0.25	5	6	30	8	NA	NA	NA
Compressor	NA	2	1	20	6	240	8	NA	NA	NA
Water Truck	NA	1	0.25	5	4	20	8	NA	NA	NA
Concrete Truck	NA	1	0.25	5	4	20	NA	32	1	31.9
Worker commute	NA	5	NA	NA	NA	NA	NA	40	1	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Demolition	250	63	ft^3	4
Excavation	1000	200	ft^3	5
grading	0.25	0.06	acre	4
Paving	0.10	0.10	acre	1
Soil dumping	5.0	5.00	yd^3	1
Soil loading	5	5	yd^*	1

Appendix A1:

Table A1-4: Construction Equipment Usage - Flyover (continued)

Flyover 7. Retaining Walls and Soundwalls - - MSE Walls at Ramps and Touchdowns

Construction duration from 3/1/2014 to 8/1/2014

Number of construction Workers 12 Round trip distance per Worker 40

	All Equipment							Per Truck		
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**
Backhoe	NA	4	2.5	50	7	1400	8	NA	NA	NA
Loader	NA	2	2	40	6	480	8	NA	NA	NA
Haulers (Truck)	NA	20	2	40	2	1600	NA	50	1.25	62
Generator	NA	2	3	60	7	840	8	NA	NA	NA
Flatbed	NA	2	3	60	6	720	NA	50	1.1	54.5
Pick Up	NA	4	3	60	6	1440	NA	50	1.25	58.5
Vibratory Roller	NA	2	2	40	6	480	8	NA	NA	NA
Compressor	NA	2	3	60	7	840	8	NA	NA	NA
Water Truck	NA	1	2.75	55	5	275	8	NA	NA	NA
Concrete Truck	NA	2	0.5	10	2	40	NA	32	1	31.75
Worker commute	NA	12	NA	NA	NA	NA	NA	40	1	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Demolition	600	120	ft^3	5
Excavation	412020	6867	ft^3	60
Grading	1.65	0.041	acre	40
Soil dumping	15260	254	yd3	60

Flyover 8. Striping, Lighting and Signing

Construction duration from 10/21/2014 to 11/21/2014

Number of construction Workers 6 Round trip distance per Worker 40

	All Equipment							Per Truck		
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**
Loader	NA	1	0.25	5	7	35	8	NA	NA	NA
Generator	NA	1	0.75	15	7	105	8	NA	NA	NA
Flatbed	NA	1	0.75	15	6	90	NA	50	1	50
Pick Up	NA	1	0.75	15	6	90	NA	50	1	50
Compressor	NA	1	0.75	15	7	105	8	NA	NA	NA
Striper (Truck)	NA	1	0.2	4	7	28	8	NA	NA	NA
Worker commute	NA	6	NA	NA	NA	NA	NA	40	1	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Demolition	80	8	ft3	10
Excavation	50	13	ft^3	4
Paving	0.5	0.25	acre	2
Soil loading	1	1	yd3	1
Soil dumping	4	4	yd4	1

Stockpile Area

Construction duration from 1/1/2014 to 11/21/2014

	Maximum Area Covered	**Unit**
Stock Piles	2	acres/day

1. Construction data provided by DMJM Harris, January 2007
2. Stock pile areas were not specified for each construction phases. The maximum areas that might be covered each day by the whole project was used to calculate the total fugitive dust emissions from stock piles.

Appendix A1:

Table A1-5: Emission Factors - Flyover

Flyover 1. Site Preparation - Earthwork

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Equipment Code	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe	Tractors/Loaders/Backhoes	1	2014	lb/hr	0.375	0.497	0.073	0.001	0.034	0.000	0.031	0.000
Haulers (Truck)	On-road Delivery	3	2014	lb/VMT	0.013	0.014	0.002	0.000	0.00055	0.997	0.000	0.211
Pick Up	On-road passenger	4	2014	lb/VMT	0.007	0.001	0.001	0.000	0.000092	0.997	0.000	0.211
Water Truck	Off-Highway Trucks	1	2014	lb/hr	0.615	1.660	0.203	0.003	0.058	0.000	0.053	0.000
Worker commute	On-road passenger	4	2014	lb/VMT	0.007	0.001	0.001	0.000	0.000	0.997	0.000	0.211

Flyover 2. Shaft and Columns - Drilled Shaft Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Equipment Code	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Caisson Drill	Bore/Drill Rigs	1	2014	lb/hr	0.503	0.711	0.073	0.002	0.025	0.000	0.023	0.000
140 ton crane	Cranes	1	2014	lb/hr	0.455	1.106	0.128	0.001	0.047	0.000	0.043	0.000
Generator	Generator Sets	1	2014	lb/hr	0.297	0.508	0.070	0.001	0.030	0.000	0.027	0.000
Flatbed	On-road Delivery	3	2014	lb/VMT	0.013	0.014	0.002	0.000	0.001	0.997	0.000	0.211
Pick Up	On-road passenger	4	2014	lb/VMT	0.007	0.001	0.001	0.000	0.000	0.997	0.000	0.211
Concrete Truck	On-road Delivery	3	2014	lb/VMT	0.013	0.014	0.002	0.000	0.001	0.997	0.000	0.211
Concrete Pump Truck	Off-Highway Trucks	1	2014	lb/hr	0.615	1.660	0.203	0.003	0.058	0.000	0.053	0.000
Compressor	Air compressor	1	2014	lb/hr	0.331	0.563	0.084	0.001	0.040	0.000	0.036	0.000
Water Truck	Off-Highway Trucks	1	2014	lb/hr	0.615	1.660	0.203	0.003	0.058	0.000	0.053	0.000
Worker commute	On-road passenger	4	2014	lb/VMT	0.007	0.001	0.001	0.000	0.000	0.997	0.000	0.211
Excavation	Excavation	12	2014	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Soil loading	Soil loading	14	2014	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.03969	0.000	0.008

Flyover 3. Shaft and Columns - Column Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Equipment Code	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
140 ton crane	Cranes	1	2014	lb/hr	0.455	1.106	0.128	0.001	0.047	0.000	0.043	0.000
Generator	Generator Sets	1	2014	lb/hr	0.297	0.508	0.070	0.001	0.030	0.000	0.027	0.000
Flatbed	On-road Delivery	3	2014	lb/VMT	0.013	0.014	0.002	0.000	0.001	0.997	0.000	0.211
Pick Up	On-road passenger	4	2014	lb/VMT	0.007	0.001	0.001	0.000	0.000	0.997	0.000	0.211
Concrete Truck	On-road Delivery	3	2014	lb/VMT	0.013	0.014	0.002	0.000	0.001	0.997	0.000	0.211
Concrete Pump Truck	Off-Highway Trucks	1	2014	lb/hr	0.615	1.660	0.203	0.003	0.058	0.000	0.053	0.000
Compressor	Air compressor	1	2014	lb/hr	0.331	0.563	0.084	0.001	0.040	0.000	0.036	0.000
Worker commute	On-road passenger	4	2014	lb/VMT	0.007	0.001	0.001	0.000	0.000	0.997	0.000	0.211

Appendix A:

Table A1-5: Emission Factors- Flyover

Flyover 4. Falsework

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Equipment Code	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
100 ton crane	Cranes	1	2014	lb/hr	0.455	1.106	0.128	0.001	0.047	0.000	0.043	0.000
Generator	Generator Sets	1	2014	lb/hr	0.297	0.508	0.070	0.001	0.030	0.000	0.027	0.000
Flatbed	On-road Delivery	3	2014	lb/VMT	0.013	0.014	0.002	0.000	0.001	0.997	0.000	0.211
Pick Up	On-road passenger	4	2014	lb/VMT	0.007	0.001	0.001	0.000	0.000	0.997	0.000	0.211
Rough Terrain (f - lift)	Rough Terrain Forklifts	1	2014	lb/hr	0.461	0.610	0.093	0.001	0.048	0.000	0.044	0.000
Scissor Lift	Other Construction Equipment	1	2014	lb/hr	0.370	0.715	0.082	0.001	0.030	0.000	0.027	0.000
Compressor	Air compressor	1	2014	lb/hr	0.331	0.563	0.084	0.001	0.040	0.000	0.036	0.000
Boom Truck	Off-Highway Trucks	1	2014	lb/hr	0.615	1.660	0.203	0.003	0.058	0.000	0.053	0.000
Worker commute	On-road passenger	4	2014	lb/VMT	0.007	0.001	0.001	0.000	0.000	0.997	0.000	0.211

Flyover 5. superstructure - Span Erection

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Equipment Code	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
275 ton crane	Cranes	1	2014	lb/hr	0.455	1.106	0.128	0.001	0.047	0.000	0.043	0.000
Rough Terrain (f-lift)	Rough Terrain Forklifts	1	2014	lb/hr	0.461	0.610	0.093	0.001	0.048	0.000	0.044	0.000
140 ton crane	Cranes	1	2014	lb/hr	0.455	1.106	0.128	0.001	0.047	0.000	0.043	0.000
Generator	Generator Sets	1	2014	lb/hr	0.297	0.508	0.070	0.001	0.030	0.000	0.027	0.000
Semi Truck	On-road HHDT	2	2014	lb/VMT	0.008	0.024	0.002	0.000	0.001	1.861	0.00101	0.395
Flatbed	On-road Delivery	3	2014	lb/VMT	0.013	0.014	0.002	0.000	0.001	0.997	0.000	0.211
Pick Up	On-road passenger	4	2014	lb/VMT	0.007	0.001	0.001	0.000	0.000	0.997	0.000	0.211
Concrete Truck	On-road Delivery	3	2014	lb/VMT	0.013	0.014	0.002	0.000	0.001	0.997	0.000	0.211
Concrete Pump Truck	Off-Highway Trucks	1	2014	lb/hr	0.615	1.660	0.203	0.003	0.058	0.000	0.053	0.000
Compressor	Air compressor	1	2014	lb/hr	0.331	0.563	0.084	0.001	0.040	0.000	0.036	0.000
Worker commute	On-road passenger	4	2014	lb/VMT	0.007	0.001	0.001	0.000	0.000	0.997	0.000	0.211
Excavation	Excavation	12	2014	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Grading	Grading	17	2014	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.40000	0.000	5.491
Soil loading	Soil loading	14	2014	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.03969	0.000	0.008

Flyover 6. Drainage

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Equipment Code	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe	Tractors/Loaders/Backhoes	1	2014	lb/hr	0.375	0.497	0.073	0.001	0.034	0.000	0.031	0.000
Haulers (Truck)	On-road Delivery	3	2014	lb/VMT	0.013	0.014	0.002	0.000	0.001	0.997	0.000	0.211
Generator	Generator Sets	1	2014	lb/hr	0.297	0.508	0.070	0.001	0.030	0.000	0.027	0.000
Flatbed	On-road Delivery	3	2014	lb/VMT	0.013	0.014	0.002	0.000	0.001	0.997	0.000	0.211
Pick Up	On-road passenger	4	2014	lb/VMT	0.007	0.001	0.001	0.000	0.000	0.997	0.000	0.211
Vibratory Roller	Rollers	1	2014	lb/hr	0.402	0.616	0.091	0.001	0.042	0.000	0.039	0.000
Compressor	Air compressor	1	2014	lb/hr	0.331	0.563	0.084	0.001	0.040	0.000	0.036	0.000
Water Truck	Off-Highway Trucks	1	2014	lb/hr	0.615	1.660	0.203	0.003	0.058	0.000	0.053	0.000
Concrete Truck	On-road Delivery	3	2014	lb/VMT	0.013	0.014	0.002	0.000	0.001	0.997	0.000	0.211
Worker commute	On-road passenger	4	2014	lb/VMT	0.007	0.001	0.001	0.000	0.000	0.997	0.000	0.211
Demolition	Demolition	11	2014	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Excavation	Excavation	12	2014	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
grading	grading	17	2014	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.40000	0.000	5.491
Paving	Paving	13	2014	lb ROG / acre	0.000	0.000	2.620	0.000	0.000	0.00000	0.000	0.000
Soil dumping	Soil dumping	15	2014	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.01634	0.000	0.003
Soil loading	Soil loading	14	2014	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.03969	0.000	0.008

Appendix A:

Table A1-5: Emission Factors (Case-in-place) - Flyover

Flyover 7. Retaining Walls and Soundwalls - - MSE Walls at Ramps and Touchdowns

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Equipment Code	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe	Tractors/Loaders/Backhoes	1	2014	lb/hr	0.375	0.497	0.073	0.001	0.034	0.000	0.031	0.000
Loader	Tractors/Loaders/Backhoes	1	2014	lb/hr	0.375	0.497	0.073	0.001	0.034	0.000	0.031	0.000
Haulers (Truck)	On-road Delivery	3	2014	lb/VMT	0.013	0.014	0.002	0.000	0.001	0.997	0.000	0.211
Generator	Generator Sets	1	2014	lb/hr	0.297	0.508	0.070	0.001	0.030	0.000	0.027	0.000
Flatbed	On-road Delivery	3	2014	lb/VMT	0.013	0.014	0.002	0.000	0.001	0.997	0.000	0.211
Pick Up	On-road passenger	4	2014	lb/VMT	0.007	0.001	0.001	0.000	0.000	0.997	0.000	0.211
Vibratory Roller	Rollers	1	2014	lb/hr	0.402	0.616	0.091	0.001	0.042	0.000	0.039	0.000
Compressor	Air compressor	1	2014	lb/hr	0.331	0.563	0.084	0.001	0.040	0.000	0.036	0.000
Water Truck	Off-Highway Trucks	1	2014	lb/hr	0.615	1.660	0.203	0.003	0.058	0.000	0.053	0.000
Concrete Truck	On-road Delivery	3	2014	lb/VMT	0.013	0.014	0.002	0.000	0.001	0.997	0.000	0.211
Worker commute	On-road passenger	4	2014	lb/VMT	0.007	0.001	0.001	0.000	0.000	0.997	0.000	0.211
Demolition	Demolition	11	2014	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Excavation	Excavation	12	2014	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Grading	Grading	17	2014	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.40000	0.000	5.491
Soil dumping	Soil dumping	15	2014	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.01634	0.000	0.003

Flyover 8. Striping, Lighting and Signing

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Equipment Code	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Loader	Tractors/Loaders/Backhoes	1	2014	lb/hr	0.375	0.497	0.073	0.001	0.034	0.000	0.031	0.000
Generator	Generator Sets	1	2014	lb/hr	0.297	0.508	0.070	0.001	0.030	0.000	0.027	0.000
Flatbed	On-road Delivery	3	2014	lb/VMT	0.013	0.014	0.002	0.000	0.001	0.997	0.000	0.211
Pick Up	On-road passenger	4	2014	lb/VMT	0.007	0.001	0.001	0.000	0.000	0.997	0.000	0.211
Compressor	Air compressor	1	2014	lb/hr	0.331	0.563	0.084	0.001	0.040	0.000	0.036	0.000
Striper (Truck)	Off-Highway Trucks	1	2014	lb/hr	0.615	1.660	0.203	0.003	0.058	0.000	0.053	0.000
Worker commute	On-road passenger	4	2014	lb/VMT	0.007	0.001	0.001	0.000	0.000	0.997	0.000	0.211
Demolition	Demolition	11	2014	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Excavation	Excavation	12	2014	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Paving	Paving	13	2014	lb ROG / acre	0.000	0.000	2.620	0.000	0.000	0.00000	0.000	0.000
Soil loading	Soil loading	14	2014	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.03969	0.000	0.008
Soil dumping	Soil dumping	15	2014	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.01634	0.000	0.003

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Equipment Code	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Stock piles	Stock piles	16	All	lb/acre/day	0.000	0.000	0.000	0.000	0.000	39.90780	0.0000	8.301

Note:

1. Stock pile areas were not specified or calculated for each construction phases. The maximum areas that might be covered each day by the whole project was used to calculate the total fugitive dust emissions from stock piles.

2. Detailed references of the emission factors are in Appendix I.

Appendix A1:

Table A1-6: Daily Emissions - Flyover

Flyover 1. Site Preparation - Earthwork

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	2.997	3.979	0.582	0.006	0.273	0.000	0.251	0.000
Haulers (Truck)	0.514	0.570	0.076	0.001	0.022	1.995	0.018	0.423
Pick Up	1.321	0.131	0.140	0.002	0.018	7.979	0.012	1.691
Water Truck	4.919	13.284	1.627	0.021	0.463	0.000	0.426	0.000
Worker commute	1.585	0.157	0.169	0.003	0.022	0.000	0.014	0.000
Total	11.335	18.121	2.594	0.033	0.798	9.973	0.721	2.114

Flyover 1. Site Preparation - Earthwork

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	2.9973	3.9789	0.5824	0.0062	0.2725	0.0000	0.2507	0.0000
Haulers (Truck)	0.5137	0.5701	0.0759	0.0011	0.0220	1.0971	0.0182	0.2326
Pick Up	1.3207	0.1310	0.1405	0.0021	0.0184	4.3883	0.0119	0.9303
Water Truck	4.9186	13.2835	1.6269	0.0213	0.4631	0.0000	0.4261	0.0000
Worker commute	1.5848	0.1572	0.1685	0.0026	0.0220	0.0000	0.0143	0.0000
Total	11.3352	18.1206	2.5942	0.0333	0.7980	5.4853	0.7211	1.1629

Flyover 2. Shaft and Columns - Drilled Shaft Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Caisson Drill	8.048	11.373	1.167	0.028	0.397	0.000	0.366	0.000
140 ton crane	3.642	8.848	1.020	0.011	0.373	0.000	0.343	0.000
Generator	4.759	8.131	1.124	0.011	0.473	0.000	0.435	0.000
Flatbed	1.605	1.781	0.237	0.003	0.069	7.979	0.057	1.691
Pick Up	1.651	0.164	0.176	0.003	0.023	15.957	0.015	3.383
Concrete Truck	6.165	6.841	0.910	0.013	0.264	4.987	0.218	1.057
Concrete Pump Truck	4.919	13.284	1.627	0.021	0.463	0.000	0.426	0.000
Compressor	5.301	9.013	1.348	0.011	0.633	0.000	0.582	0.000
Water Truck	4.919	13.284	1.627	0.021	0.463	0.000	0.426	0.000
Worker commute	2.641	0.262	0.281	0.004	0.037	0.000	0.024	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.231	0.000	0.048
Soil loading	0.000	0.000	0.000	0.000	0.000	0.809	0.000	0.168
Total	43.649	72.981	9.517	0.128	3.195	29.962	2.892	6.348

Flyover 2. Shaft and Columns - Drilled Shaft Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Caisson Drill	8.048	11.373	1.167	0.028	0.397	0.0000	0.3655	0.0000
140 ton crane	3.642	8.848	1.020	0.011	0.373	0.0000	0.3431	0.0000
Generator	4.759	8.131	1.124	0.011	0.473	0.0000	0.4352	0.0000
Flatbed	1.605	1.781	0.237	0.003	0.069	4.3883	0.0569	0.9303
Pick Up	1.651	0.164	0.176	0.003	0.023	8.7765	0.0148	1.8606
Concrete Truck	6.165	6.841	0.910	0.013	0.264	2.7427	0.2185	0.5814
Concrete Pump Truck	4.919	13.284	1.627	0.021	0.463	0.0000	0.4261	0.0000
Compressor	5.301	9.013	1.348	0.011	0.633	0.0000	0.5824	0.0000
Water Truck	4.919	13.284	1.627	0.021	0.463	0.0000	0.4261	0.0000
Worker commute	2.641	0.262	0.281	0.004	0.037	0.0000	0.0238	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.0739	0.0000	0.0154
Soil loading	0.000	0.000	0.000	0.000	0.000	0.2587	0.0000	0.0538
Total	43.649	72.981	9.517	0.128	3.195	16.240	2.892	3.442

Flyover 3. Shaft and Columns - Column Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	3.642	8.848	1.020	0.011	0.373	0.000	0.343	0.000
Generator	4.759	8.131	1.124	0.011	0.473	0.000	0.435	0.000
Flatbed	1.605	1.781	0.237	0.003	0.069	7.979	0.057	1.691
Pick Up	1.238	0.123	0.132	0.002	0.017	11.968	0.011	2.537
Concrete Truck	3.288	3.648	0.486	0.007	0.141	1.995	0.117	0.423
Concrete Pump Truck	4.919	13.284	1.627	0.021	0.463	0.000	0.426	0.000
Compressor	5.301	9.013	1.348	0.011	0.633	0.000	0.582	0.000
Worker commute	2.641	0.262	0.281	0.004	0.037	0.000	0.024	0.000
Total	27.393	45.090	6.254	0.072	2.205	21.941	1.995	4.652

Flyover 3. Shaft and Columns - Column Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	3.642	8.848	1.020	0.011	0.373	0.000	0.3431	0.0000
Generator	4.759	8.131	1.124	0.011	0.473	0.000	0.4352	0.0000
Flatbed	1.605	1.781	0.237	0.003	0.069	4.388	0.0569	0.9303
Pick Up	1.238	0.123	0.132	0.002	0.017	6.582	0.0111	1.3955
Concrete Truck	3.288	3.648	0.486	0.007	0.141	1.097	0.1165	0.2326
Concrete Pump Truck	4.919	13.284	1.627	0.021	0.463	0.000	0.4261	0.0000
Compressor	5.301	9.013	1.348	0.011	0.633	0.000	0.5824	0.0000
Worker commute	2.641	0.262	0.281	0.004	0.037	0.000	0.0238	0.0000
Total	27.393	45.090	6.254	0.072	2.205	12.068	1.995	2.558

Appendix A1:

Table A1-6: Daily Emissions - Flyover (continued)

Flyover 4. Falsework

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
100 ton crane	3.642	8.848	1.020	0.011	0.373	0.000	0.343	0.000
Generator	9.518	16.263	2.248	0.022	0.946	0.000	0.870	0.000
Flatbed	1.605	1.781	0.237	0.003	0.069	7.979	0.057	1.691
Pick Up	0.825	0.082	0.088	0.001	0.011	7.979	0.007	1.691
Rough Terrain (f - lift)	14.744	19.524	2.971	0.026	1.525	0.000	1.403	0.000
Scissor Lift	5.916	11.438	1.311	0.020	0.473	0.000	0.435	0.000
Compressor	10.601	18.026	2.696	0.023	1.266	0.000	1.165	0.000
Boom Truck	9.837	26.567	3.254	0.043	0.926	0.000	0.852	0.000
Worker commute	2.641	0.262	0.281	0.004	0.037	0.000	0.024	0.000
Total	59.331	102.791	14.106	0.154	5.626	15.957	5.157	3.383

Flyover 4. Falsework

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
100 ton crane	3.642	8.848	1.020	0.011	0.373	0.000	0.3431	0.0000
Generator	9.518	16.263	2.248	0.022	0.946	0.000	0.8704	0.0000
Flatbed	1.605	1.781	0.237	0.003	0.069	4.388	0.0569	0.9303
Pick Up	0.825	0.082	0.088	0.001	0.011	4.388	0.0074	0.9303
Rough Terrain (f - lift)	14.744	19.524	2.971	0.026	1.525	0.000	1.4030	0.0000
Scissor Lift	5.916	11.438	1.311	0.020	0.473	0.000	0.4353	0.0000
Compressor	10.601	18.026	2.696	0.023	1.266	0.000	1.1649	0.0000
Boom Truck	9.837	26.567	3.254	0.043	0.926	0.000	0.8521	0.0000
Worker commute	2.641	0.262	0.281	0.004	0.037	0.000	0.0238	0.0000
Total	59.331	102.791	14.106	0.154	5.626	8.777	5.157	1.861

Flyover 5. superstructure - Span Erection

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	3.642	8.848	1.020	0.011	0.373	0.000	0.343	0.000
Rough Terrain (f-lift)	14.744	19.524	2.971	0.026	1.525	0.000	1.403	0.000
140 ton crane	3.642	8.848	1.020	0.011	0.373	0.000	0.343	0.000
Generator	9.518	16.263	2.248	0.022	0.946	0.000	0.870	0.000
Semi Truck	1.693	4.836	0.403	0.008	0.237	4.653	0.201	0.986
Flatbed	4.816	5.344	0.711	0.010	0.206	23.936	0.171	5.074
Pick Up	2.476	0.246	0.263	0.004	0.034	23.936	0.022	5.074
Concrete Truck	8.220	9.121	1.214	0.018	0.352	4.987	0.291	1.057
Concrete Pump Truck	9.837	26.567	3.254	0.043	0.926	0.000	0.852	0.000
Compressor	10.601	18.026	2.696	0.023	1.266	0.000	1.165	0.000
Worker commute	3.170	0.314	0.337	0.005	0.044	0.000	0.029	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Grading	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Soil loading	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	72.359	117.937	16.138	0.181	6.282	57.511	5.690	12.192

Flyover 5. superstructure - Span Erection

0

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	3.642	8.848	1.020	0.011	0.373	0.000	0.3431	0.0000
Rough Terrain (f-lift)	14.744	19.524	2.971	0.026	1.525	0.000	1.4030	0.0000
140 ton crane	3.642	8.848	1.020	0.011	0.373	0.000	0.3431	0.0000
Generator	9.518	16.263	2.248	0.022	0.946	0.000	0.8704	0.0000
Semi Truck	1.693	4.836	0.403	0.008	0.237	2.559	0.2012	0.5425
Flatbed	4.816	5.344	0.711	0.010	0.206	13.165	0.1707	2.7909
Pick Up	2.476	0.246	0.263	0.004	0.034	13.165	0.0223	2.7909
Concrete Truck	8.220	9.121	1.214	0.018	0.352	2.743	0.2913	0.5814
Concrete Pump Truck	9.837	26.567	3.254	0.043	0.926	0.000	0.8521	0.0000
Compressor	10.601	18.026	2.696	0.023	1.266	0.000	1.1649	0.0000
Worker commute	3.170	0.314	0.337	0.005	0.044	0.000	0.0285	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000
Grading	0.000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000
Soil loading	0.000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000
Total	72.359	117.937	16.138	0.181	6.282	31.631	5.690	6.706

Flyover 6. Drainage

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	2.997	3.979	0.582	0.006	0.273	0.000	0.251	0.000
Haulers (Truck)	0.411	0.456	0.061	0.001	0.018	0.249	0.015	0.053
Generator	4.759	8.131	1.124	0.011	0.473	0.000	0.435	0.000
Flatbed	1.284	1.425	0.190	0.003	0.055	0.997	0.046	0.211
Pick Up	0.825	0.082	0.088	0.001	0.011	3.989	0.007	0.846
Vibratory Roller	3.214	4.931	0.730	0.006	0.335	0.000	0.308	0.000
Compressor	5.301	9.013	1.348	0.011	0.633	0.000	0.582	0.000
Water Truck	4.919	13.284	1.627	0.021	0.463	0.000	0.426	0.000
Concrete Truck	0.411	0.456	0.061	0.001	0.018	0.100	0.015	0.021
Worker commute	1.321	0.131	0.140	0.002	0.018	0.000	0.012	0.000
Demolition	0.000	0.000	0.000	0.000	0.000	0.026	0.000	0.005
Excavation	0.000	0.000	0.000	0.000	0.000	0.084	0.000	0.017
grading	0.000	0.000	0.000	0.000	0.000	1.650	0.000	0.343
Paving	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Soil dumping	0.000	0.000	0.000	0.000	0.000	0.082	0.000	0.017
Soil loading	0.000	0.000	0.000	0.000	0.000	0.198	0.000	0.041
Total	25.442	41.888	5.950	0.064	2.297	7.376	2.097	1.556

Flyover 6. Drainage

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	2.997	3.979	0.582	0.006	0.273	0.000	0.2507	0.0000
Haulers (Truck)	0.411	0.456	0.061	0.001	0.018	0.137	0.0146	0.0291
Generator	4.759	8.131	1.124	0.011	0.473	0.000	0.4352	0.0000
Flatbed	1.284	1.425	0.190	0.003	0.055	0.549	0.0455	0.1163
Pick Up	0.825	0.082	0.088	0.001	0.011	2.194	0.0074	0.4652
Vibratory Roller	3.214	4.931	0.730	0.006	0.335	0.000	0.3084	0.0000
Compressor	5.301	9.013	1.348	0.011	0.633	0.000	0.5824	0.0000
Water Truck	4.919	13.284	1.627	0.021	0.463	0.000	0.4261	0.0000
Concrete Truck	0.411	0.456	0.061	0.001	0.018	0.055	0.0146	0.0116
Worker commute	1.321	0.131	0.140	0.002	0.018	0.000	0.0119	0.0000
Demolition	0.000	0.000	0.000	0.000	0.000	0.008	0.0000	0.0017
Excavation	0.000	0.000	0.000	0.000	0.000	0.027	0.0000	0.0056
grading	0.000	0.000	0.000	0.000	0.000	0.528	0.0000	0.1098
Paving	0.000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000
Soil dumping	0.000	0.000	0.000	0.000	0.000	0.026	0.0000	0.0054
Soil loading	0.000	0.000	0.000	0.000	0.000	0.064	0.0000	0.0132
Total	25.442	41.888	5.950	0.064	2.297	3.588	2.097	0.758

Appendix A1:

Table A1-6: Daily Emissions - Flyover (continued)

Flyover 7. Retaining Walls and Soundwalls - - MSE Walls at Ramps and Touchdowns
Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	11.989	15.916	2.330	0.025	1.090	0.000	1.003	0.000
Loader	5.995	7.958	1.165	0.012	0.545	0.000	0.501	0.000
Haulers (Truck)	16.054	17.815	2.371	0.034	0.687	9.973	0.569	2.114
Generator	4.759	8.131	1.124	0.011	0.473	0.000	0.435	0.000
Flatbed	1.413	1.568	0.209	0.003	0.060	0.997	0.050	0.211
Pick Up	1.651	0.164	0.176	0.003	0.023	15.957	0.015	3.383
Vibratory Roller	6.428	9.861	1.459	0.012	0.670	0.000	0.617	0.000
Compressor	5.301	9.013	1.348	0.011	0.633	0.000	0.582	0.000
Water Truck	4.919	13.284	1.627	0.021	0.463	0.000	0.426	0.000
Concrete Truck	0.822	0.912	0.121	0.002	0.035	0.499	0.029	0.106
Worker commute	3.170	0.314	0.337	0.005	0.044	0.000	0.029	0.000
Demolition	0.000	0.000	0.000	0.000	0.000	0.050	0.000	0.010
Excavation	0.000	0.000	0.000	0.000	0.000	2.884	0.000	0.600
Grading	0.000	0.000	0.000	0.000	0.000	1.089	0.000	0.227
Soil dumping	0.000	0.000	0.000	0.000	0.000	4.155	0.000	0.864
Total	62.499	84.935	12.265	0.140	4.724	35.605	4.256	7.515

Flyover 7. Retaining Walls and Soundwalls - - MSE Walls at Ramps and Touchdowns
Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	11.989	15.916	2.330	0.025	1.090	0.000	1.0030	0.0000
Loader	5.995	7.958	1.165	0.012	0.545	0.000	0.5015	0.0000
Haulers (Truck)	16.054	17.815	2.371	0.034	0.687	5.485	0.5690	1.1629
Generator	4.759	8.131	1.124	0.011	0.473	0.000	0.4352	0.0000
Flatbed	1.413	1.568	0.209	0.003	0.060	0.549	0.0501	0.1163
Pick Up	1.651	0.164	0.176	0.003	0.023	8.777	0.0148	1.8606
Vibratory Roller	6.428	9.861	1.459	0.012	0.670	0.000	0.6167	0.0000
Compressor	5.301	9.013	1.348	0.011	0.633	0.000	0.5824	0.0000
Water Truck	4.919	13.284	1.627	0.021	0.463	0.000	0.4261	0.0000
Concrete Truck	0.822	0.912	0.121	0.002	0.035	0.274	0.0291	0.0581
Worker commute	3.170	0.314	0.337	0.005	0.044	0.000	0.0285	0.0000
Demolition	0.000	0.000	0.000	0.000	0.000	0.016	0.0000	0.0034
Excavation	0.000	0.000	0.000	0.000	0.000	0.923	0.0000	0.1920
Grading	0.000	0.000	0.000	0.000	0.000	0.348	0.0000	0.0725
Soil dumping	0.000	0.000	0.000	0.000	0.000	1.329	0.0000	0.2765
Total	62.499	84.935	12.265	0.140	4.724	17.702	4.256	3.742

Flyover 8. Striping, Lighting and Signing
Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Loader	2.997	3.979	0.582	0.006	0.273	0.000	0.251	0.000
Generator	2.379	4.066	0.562	0.006	0.237	0.000	0.218	0.000
Flatbed	0.642	0.713	0.095	0.001	0.027	0.000	0.023	0.000
Pick Up	0.330	0.033	0.035	0.001	0.005	0.000	0.003	0.000
Compressor	2.650	4.507	0.674	0.006	0.317	0.000	0.291	0.000
Striper (Truck)	4.919	13.284	1.627	0.021	0.463	0.000	0.426	0.000
Worker commute	1.585	0.157	0.169	0.003	0.022	0.000	0.014	0.000
Demolition	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.001
Excavation	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.001
Paving	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Soil loading	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008
Soil dumping	0.000	0.000	0.000	0.000	0.000	0.065	0.000	0.014
Total	15.503	26.737	3.744	0.043	1.343	0.114	1.226	0.024

Flyover 8. Striping, Lighting and Signing
Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Loader	2.997	3.979	0.582	0.006	0.273	0.000	0.2507	0.0000
Generator	2.379	4.066	0.562	0.006	0.237	0.000	0.2176	0.0000
Flatbed	0.642	0.713	0.095	0.001	0.027	0.000	0.0228	0.0000
Pick Up	0.330	0.033	0.035	0.001	0.005	0.000	0.0030	0.0000
Compressor	2.650	4.507	0.674	0.006	0.317	0.000	0.2912	0.0000
Striper (Truck)	4.919	13.284	1.627	0.021	0.463	0.000	0.4261	0.0000
Worker commute	1.585	0.157	0.169	0.003	0.022	0.000	0.0143	0.0000
Demolition	0.000	0.000	0.000	0.000	0.000	0.001	0.0000	0.0002
Excavation	0.000	0.000	0.000	0.000	0.000	0.002	0.0000	0.0003
Paving	0.000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000
Soil loading	0.000	0.000	0.000	0.000	0.000	0.013	0.0000	0.0026
Soil dumping	0.000	0.000	0.000	0.000	0.000	0.021	0.0000	0.0043
Total	15.503	26.737	3.744	0.043	1.343	0.036	1.226	0.008

SHB and SR-47: Stockpile Area
Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Stock piles	0.000	0.000	0.000	0.000	0.000	79.8	0.0	16.6

SHB and SR-47: Stockpile Area
Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

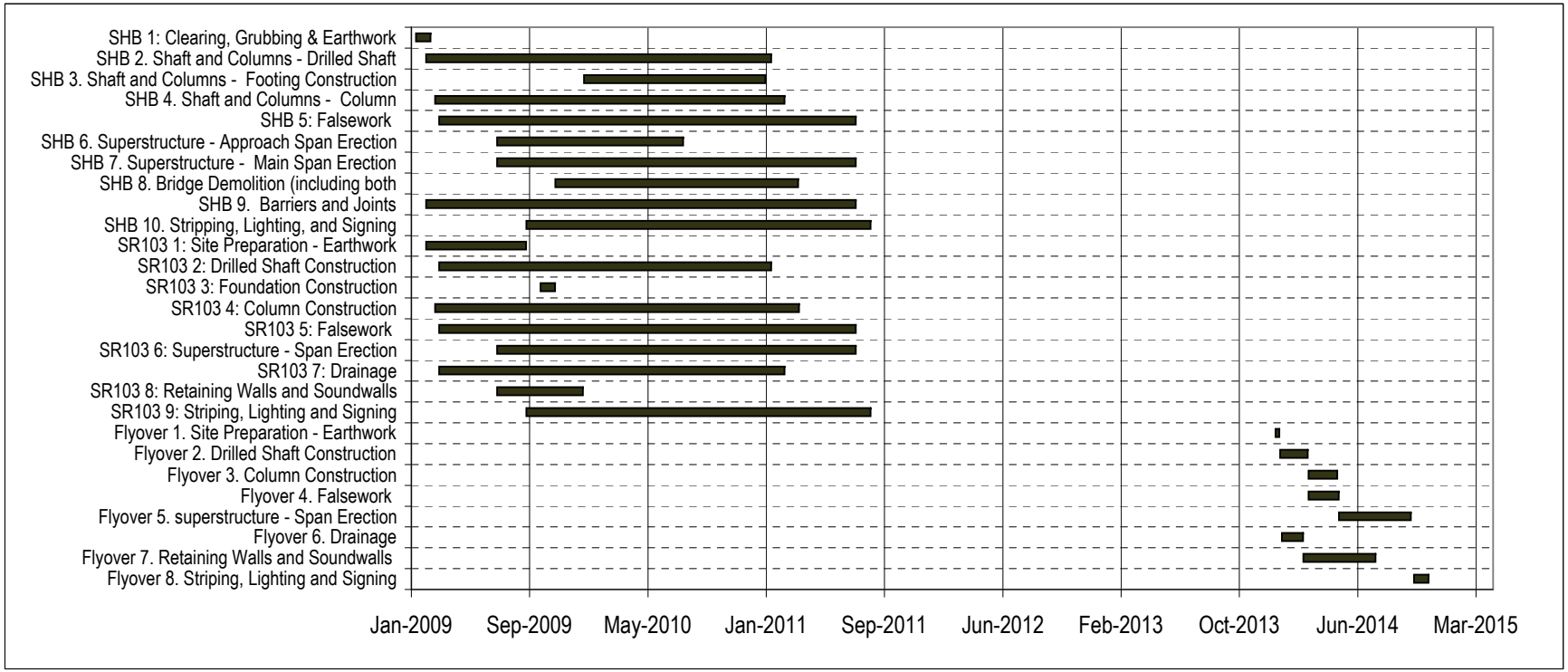
	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Stock piles	0.000	0.000	0.000	0.000	0.000	25.541	0.0000	5.3125

Note:
Stock pile areas were not specified or calculated for each construction phases. The maximum areas that might be covered each day by the whole project was used to calculate the total fugitive dust emissions from stock piles.

Appendix B
Construction Emission Calculations – Alternative 2, CIP Method

Appendix B:

Table B1: Construction Schedule (Case-in-place) - Alternative 2



Source: DMJM Harris, May 2005, January 2007

Appendix B:

Table B2: Maximum Construction Emissions: By Source (Case-in-place) - Alternative 2

Maximum Daily Construction Emissions

		CO (lb/day)	NOx (lb/day)	ROG (lb/day)	SOx (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
With Watering to Control Fugitive Dust	Maximum Construction Equipment Exhaust	822	1736	204	2	83	76
	Maximum Workers Commute	75	7.8	7.7	0.08	0.67	0.42
	Maximum Fugitive Dust	NA	NA	NA	NA	904	191
	Maximum Combined Daily Emissions	**897**	**1744**	**211**	**1.9**	**988**	**268**
SCAQMD Thresholds		550	100	75	150	150	55
Exceeding Thresholds?		YES	YES	YES	NO	YES	Yes

Note: The maximum daily emissions from equipment exhaust, fugitive dust, and workers commute are not additive because these worst case emissions do not always occur on the same day.

Appendix B:
Table B3. Summary of Daily Emissions (Case-in-place) - Alternative 2

		Total Emissions without Watering (lb/day)									
Construction Phases		**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**PM_{10} Fugitive**	**PM_{10} Total**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ Fugitive**	**$PM_{2.5}$ Total**
1	SHB 1: Clearing, Grubbing & Earthwork	7.34	8.24	1.38	0.01	0.55	8.98	9.52	0.49	1.90	2.40
2	SHB 2. Shaft and Columns - Drilled Shaft Construction	52.15	103.36	12.52	0.12	4.56	63.74	68.29	4.15	13.50	17.65
3	SHB 3. Shaft and Columns - Footing Construction	47.63	88.08	10.81	0.10	3.89	57.06	60.95	3.51	12.09	15.61
4	SHB 4. Shaft and Columns - Column Construction	26.76	51.26	6.44	0.06	2.33	32.91	35.24	2.12	6.98	9.10
5	SHB 5: Falsework	117.31	322.90	25.10	0.27	12.85	424.08	436.93	11.77	89.90	101.68
6	SHB 6. Superstructure - Approach Span Erection	89.37	157.67	21.01	0.17	8.12	177.12	185.25	7.37	37.52	44.90
7	SHB 7. Superstructure - Main Span Erection	85.67	157.46	19.97	0.17	7.61	165.97	173.59	6.90	35.18	42.09
8	SHB 8. Bridge Demolition (including both approaches)	81.77	116.66	17.95	0.13	7.34	127.35	134.69	6.67	26.98	33.65
9	SHB 9. Barriers and Joints	7.51	5.89	0.97	0.01	0.25	17.68	17.94	0.21	3.75	3.96
10	SHB 10. Stripping, Lighting, and Signing	36.19	91.97	10.22	0.10	3.64	47.59	51.22	3.32	10.09	13.41
11	SR103 1: Site Preparation - Earthwork	77.01	128.57	18.47	0.14	7.52	95.74	103.27	6.86	20.30	27.15
12	SR103 2: Drilled Shaft Construction	52.15	103.36	12.52	0.12	4.56	65.11	69.67	4.15	13.79	17.94
13	SR103 3: Foundation Construction	47.22	98.51	11.75	0.11	4.41	47.93	52.35	4.03	10.16	14.19
14	SR103 4: Column Construction	27.79	50.95	6.53	0.06	2.33	55.85	58.18	2.11	11.84	13.95
15	SR103 5: Falsework	56.77	101.32	14.17	0.11	6.08	51.86	57.94	5.57	10.99	16.56
16	SR103 6: Superstructure - Span Erection	113.20	212.00	28.08	0.23	10.78	175.96	186.73	9.80	37.25	47.05
17	SR103 7: Drainage	49.82	81.44	11.89	0.09	4.61	76.99	81.60	4.20	16.31	20.51
18	SR103 8: Retaining Walls and Soundwalls	51.00	83.86	11.86	0.09	4.82	59.11	63.93	4.38	12.50	16.88
19	SR103 9: Striping, Lighting and Signing	53.06	99.67	13.28	0.12	5.21	72.22	77.43	4.76	15.31	20.07
20	Flyover 1. Site Preparation - Earthwork	11.34	18.12	2.59	0.03	0.80	9.97	10.77	0.72	2.11	2.84
21	Flyover 2. Drilled Shaft Construction	43.65	72.98	9.52	0.13	3.19	29.96	33.16	2.89	6.35	9.24
22	Flyover 3. Column Construction	27.39	45.09	6.25	0.07	2.21	21.94	24.15	2.00	4.65	6.65
23	Flyover 4. Falsework	59.33	102.79	14.11	0.15	5.63	15.96	21.58	5.16	3.38	8.54
24	Flyover 5. superstructure - Span Erection	72.36	117.94	16.14	0.18	6.28	57.51	63.79	5.69	12.19	17.88
25	Flyover 6. Drainage	25.44	41.89	5.95	0.06	2.30	7.38	9.67	2.10	1.56	3.65
26	Flyover 7. Retaining Walls and Soundwalls	62.50	84.94	12.27	0.14	4.72	35.60	40.33	4.26	7.52	11.77
27	Flyover 8. Striping, Lighting and Signing	15.50	26.74	3.74	0.04	1.34	0.11	1.46	1.23	0.02	1.25
	SHB SR103 Stock Piles	0.00	0.00	0.00	0.00	0.00	79.82	79.82	0.00	16.60	16.60
	Overlapping phases										
	2,4,5,9,11,12,14,15,17	467	949	109	0.98	45	964	1009	41.1	204.0	245.1
	2,4,5,6,7,9,11,12,14,15,16,17,18	807	1560	190	1.65	76	1542	1618	69.6	326.4	396.0
	2,4,5,6,7,9,10,12,13,14,15,16,17,18,19	866	1722	206	1.83	82	1614	1696	74.8	341.7	416.5
	2,3,4,5,6,7,8,9,10,12,14,15,16,17,19	897	1744	211	1.87	84	1691	1775	76.6	358.1	434.7
	2,3,4,5,7,8,9,10,12,14,15,16,17,19	808	1586	190	1.70	76	1514	1590	69.2	320.6	389.8
	20	11	18	2.6	0.03	0.8	90	91	0.7	18.7	19.4
	21,25	69	115	15	0.19	5.5	117	123	5.0	24.5	29.5
	22,23,26	149	233	33	0.37	13	153	166	11.4	32.2	43.6
	27	16	27	3.7	0.04	1.3	80	81	1.2	16.6	17.9
	Max. Daily Emissions	**897**	**1744**	**211**	**1.9**	**84**	**1691**	**1775**	**77**	**358**	**435**

Note:
1. Based on the construction schedule, emissions from overlapping construction phases were added together to evaluate the worst case scenarios. The maximum daily emissions represent the scenario of overlapping phases with the highest emissions.
2. Fugitive dust emissions from stock piles were not calculated for each construction phase. The emissions were calculated separately based on a maximum area that the stock piles will cover during the entire construction duration.
3. The fugitive dusts were assumed to be controlled by 68% by watering the site 3 times per day, and 45% by watering the unpaved roads 3 times a day, according to the control efficiencies in SCAQMD CEQA Air Quality Handbook Table 11-4.

Appendix B:
Table B3. Summary of Daily Emissions (Case-in-place)

		Total Emissions with Watering (lb/day)									
Construction Phases		**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**PM_{10} Fugitive**	**PM_{10} Total**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ Fugitive**	**$PM_{2.5}$ Total**
1	SHB 1: Clearing, Grubbing & Earthwork	7.34	8.24	1.38	0.01	0.55	4.94	5.48	0.49	1.05	1.54
2	SHB 2. Shaft and Columns - Drilled Shaft Construction	52.15	103.36	12.52	0.12	4.56	34.62	39.17	4.15	7.34	11.48
3	SHB 3. Shaft and Columns - Footing Construction	47.63	88.08	10.81	0.10	3.89	31.11	34.99	3.51	6.59	10.11
4	SHB 4. Shaft and Columns - Column Construction	26.76	51.26	6.44	0.06	2.33	18.10	20.43	2.12	3.84	5.96
5	SHB 5: Falsework	117.31	322.90	25.10	0.27	12.85	233.24	246.09	11.77	49.45	61.22
6	SHB 6. Superstructure - Approach Span Erection	89.37	157.67	21.01	0.17	8.12	95.89	104.01	7.37	20.32	27.69
7	SHB 7. Superstructure - Main Span Erection	85.67	157.46	19.97	0.17	7.61	90.94	98.56	6.90	19.28	26.18
8	SHB 8. Bridge Demolition (including both approaches)	81.77	116.66	17.95	0.13	7.34	69.20	76.54	6.67	14.66	21.33
9	SHB 9. Barriers and Joints	7.51	5.89	0.97	0.01	0.25	9.73	9.98	0.21	2.06	2.27
10	SHB 10. Stripping, Lighting, and Signing	36.19	91.97	10.22	0.10	3.64	26.11	29.75	3.32	5.54	8.86
11	SR103 1: Site Preparation - Earthwork	77.01	128.57	18.47	0.14	7.52	52.66	60.18	6.86	11.16	18.02
12	SR103 2: Drilled Shaft Construction	52.15	103.36	12.52	0.12	4.56	35.06	39.61	4.15	7.43	11.57
13	SR103 3: Foundation Construction	47.22	98.51	11.75	0.11	4.41	26.35	30.76	4.03	5.59	9.61
14	SR103 4: Column Construction	27.79	50.95	6.53	0.06	2.33	30.72	33.05	2.11	6.51	8.63
15	SR103 5: Falsework	56.77	101.32	14.17	0.11	6.08	28.52	34.61	5.57	6.05	11.61
16	SR103 6: Superstructure - Span Erection	113.20	212.00	28.08	0.23	10.78	93.68	104.46	9.80	19.84	29.65
17	SR103 7: Drainage	49.82	81.44	11.89	0.09	4.61	41.61	46.22	4.20	8.82	13.01
18	SR103 8: Retaining Walls and Soundwalls	51.00	83.86	11.86	0.09	4.82	30.84	35.66	4.38	6.53	10.91
19	SR103 9: Striping, Lighting and Signing	53.06	99.67	13.28	0.12	5.21	39.63	44.84	4.76	8.40	13.16
20	Flyover 1. Site Preparation - Earthwork	11.34	18.12	2.59	0.03	0.80	5.49	6.28	0.72	1.16	1.88
21	Flyover 2. Drilled Shaft Construction	43.65	72.98	9.52	0.13	3.19	16.24	19.43	2.89	3.44	6.33
22	Flyover 3. Column Construction	27.39	45.09	6.25	0.07	2.21	12.07	14.27	2.00	2.56	4.55
23	Flyover 4. Falsework	59.33	102.79	14.11	0.15	5.63	8.78	14.40	5.16	1.86	7.02
24	Flyover 5. superstructure - Span Erection	72.36	117.94	16.14	0.18	6.28	31.63	37.91	5.69	6.71	12.40
25	Flyover 6. Drainage	25.44	41.89	5.95	0.06	2.30	3.59	5.88	2.10	0.76	2.85
26	Flyover 7. Retaining Walls and Soundwalls	62.50	84.94	12.27	0.14	4.72	17.70	22.43	4.26	3.74	8.00
27	Flyover 8. Striping, Lighting and Signing	15.50	26.74	3.74	0.04	1.34	0.04	1.38	1.23	0.01	1.23
	SHB SR103 Stock Piles	0.00	0.00	0.00	0.00	0.00	25.54	25.54	0.00	5.31	5.31
	Overlapping phases										
	2,4,5,9,11,12,14,15,17	467	949	109	0.98	45	510	555	41	108	149
	2,4,5,6,7,9,11,12,14,15,16,17,18	807	1560	190	1.65	76	821	898	70	174	244
	2,4,5,6,7,9,10,12,13,14,15,16,17,18,19	866	1722	206	1.83	82	861	943	75	182	257
	2,3,4,5,6,7,8,9,10,12,14,15,16,17,19	897	1744	211	1.87	84	904	988	77	191	268
	2,3,4,5,7,8,9,10,12,14,15,16,17,19	808	1586	190	1.70	76	808	884	69	171	240
	20	11	18	2.6	0.03	0.8	31	32	0.7	6.5	7.2
	21,25	69	115	15	0.19	5.5	45	51	5	10	15
	22,23,26	149	233	33	0.37	13	64	77	11	13	25
	27	16	27	3.7	0.04	1.3	26	27	1.2	5.3	6.5
	Max. Daily Emissions	**897**	**1744**	**211**	**1.9**	**84**	**904**	**988**	**77**	**191**	**268**

Appendix B:
Table B3. Summary of Daily Emissions (Case-in-place)

		Construction Equipment Exhaust (lb/day)						Workers Commute (lb/day)					
	Construction Phases	**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**$PM_{2.5}$ Exhaust**	**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**$PM_{2.5}$ Exhaust**
1	SHB 1: Clearing, Grubbing & Earthwork	5.79	8.08	1.23	0.01	0.53	0.48	1.550	0.161	0.159	0.002	0.014	0.009
2	SHB 2. Shaft and Columns - Drilled Shaft Construction	46.72	102.80	11.96	0.11	4.51	4.12	5.424	0.563	0.556	0.006	0.048	0.030
3	SHB 3. Shaft and Columns - Footing Construction	45.31	87.82	10.56	0.10	3.86	3.50	2.314	0.257	0.256	0.003	0.024	0.015
4	SHB 4. Shaft and Columns - Column Construction	24.05	50.98	6.17	0.05	2.31	2.10	2.712	0.281	0.278	0.003	0.024	0.015
5	SHB 5: Falsework	111.50	322.30	24.50	0.27	12.80	11.74	5.811	0.603	0.595	0.006	0.052	0.032
6	SHB 6. Superstructure - Approach Span Erection	83.56	157.07	20.41	0.17	8.07	7.34	5.811	0.603	0.595	0.006	0.052	0.032
7	SHB 7. Superstructure - Main Span Erection	79.86	156.85	19.38	0.16	7.56	6.87	5.811	0.603	0.595	0.006	0.052	0.032
8	SHB 8. Bridge Demolition (including both approaches)	75.58	116.02	17.32	0.13	7.29	6.63	6.199	0.643	0.635	0.007	0.055	0.034
9	SHB 9. Barriers and Joints	4.41	5.57	0.66	0.01	0.22	0.19	3.099	0.322	0.318	0.003	0.028	0.017
10	SHB 10. Stripping, Lighting, and Signing	32.32	91.56	9.83	0.10	3.60	3.30	3.874	0.402	0.397	0.004	0.034	0.022
11	SR103 1: Site Preparation - Earthwork	71.20	127.97	17.87	0.14	7.47	6.82	5.811	0.603	0.595	0.006	0.052	0.032
12	SR103 2: Drilled Shaft Construction	46.72	102.80	11.96	0.11	4.51	4.12	5.424	0.563	0.556	0.006	0.048	0.030
13	SR103 3: Foundation Construction	44.51	98.23	11.47	0.11	4.39	4.01	2.712	0.281	0.278	0.003	0.024	0.015
14	SR103 4: Column Construction	25.08	50.66	6.26	0.05	2.30	2.10	2.712	0.281	0.278	0.003	0.024	0.015
15	SR103 5: Falsework	50.96	100.72	13.58	0.11	6.03	5.53	5.811	0.603	0.595	0.006	0.052	0.032
16	SR103 6: Superstructure - Span Erection	103.51	211.00	27.09	0.22	10.69	9.75	9.686	1.005	0.992	0.011	0.086	0.054
17	SR103 7: Drainage	45.17	80.96	11.42	0.09	4.57	4.17	4.649	0.482	0.476	0.005	0.041	0.026
18	SR103 8: Retaining Walls and Soundwalls	46.74	83.41	11.42	0.09	4.78	4.36	4.262	0.442	0.437	0.005	0.038	0.024
19	SR103 9: Striping, Lighting and Signing	47.64	99.11	12.73	0.11	5.16	4.73	5.424	0.563	0.556	0.006	0.048	0.030
20	Flyover 1. Site Preparation - Earthwork	9.75	17.96	2.43	0.03	0.78	0.71	1.585	0.157	0.169	0.003	0.022	0.014
21	Flyover 2. Drilled Shaft Construction	41.01	72.72	9.24	0.12	3.16	2.87	2.641	0.262	0.281	0.004	0.037	0.024
22	Flyover 3. Column Construction	24.75	44.83	5.97	0.07	2.17	1.97	2.641	0.262	0.281	0.004	0.037	0.024
23	Flyover 4. Falsework	56.69	102.53	13.83	0.15	5.59	5.13	2.641	0.262	0.281	0.004	0.037	0.024
24	Flyover 5. superstructure - Span Erection	69.19	117.62	15.80	0.18	6.24	5.66	3.170	0.314	0.337	0.005	0.044	0.029
25	Flyover 6. Drainage	24.12	41.76	5.81	0.06	2.28	2.08	1.321	0.131	0.140	0.002	0.018	0.012
26	Flyover 7. Retaining Walls and Soundwalls	59.33	84.62	11.93	0.14	4.68	4.23	3.170	0.314	0.337	0.005	0.044	0.029
27	Flyover 8. Striping, Lighting and Signing	13.92	26.58	3.58	0.04	1.32	1.21	1.585	0.157	0.169	0.003	0.022	0.014
	SHB SR103 Stock Piles	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000
	Overlapping phases												
	2,4,5,9,11,12,14,15,17	426	945	104	0.9	45	41	41	4.30	4.25	0.05	0.37	0.23
	2,4,5,6,7,9,11,12,14,15,16,17,18	739	1553	183	1.6	76	69	67	6.96	6.87	0.07	0.60	0.37
	2,4,5,6,7,9,10,12,13,14,15,16,17,18,19	793	1714	199	1.8	82	74	73	7.60	7.50	0.08	0.65	0.41
	2,3,4,5,6,7,8,9,10,12,14,15,16,17,19	822	1736	204	1.8	83	76	75	7.78	7.68	0.08	0.67	0.42
	2,3,4,5,7,8,9,10,12,14,15,16,17,19	739	1579	183	1.6	75	69	69	7.17	7.08	0.08	0.62	0.39
	20	10	18	2.4	0.031	0.8	0.7	1.6	0.16	0.17	0.003	0.02	0.01
	21,25	65	114	15	0.2	5.4	5.0	4.0	0.39	0.42	0.006	0.06	0.04
	22,23,26	141	232	32	0.4	12	11	8.5	0.84	0.90	0.014	0.12	0.08
	27	14	27	3.58	0.04	1.32	1.21	1.6	0.16	0.17	0.003	0.02	0.01
	Max. Daily Emissions	**822**	**1736**	**204**	**1.8**	**83**	**76**	**75**	**7.8**	**7.7**	**0.1**	**0.7**	**0.4**

Appendix B:

Table B4: Construction Equipment Usage (Case-in-place) - Alternative 2

Schuyler Heim Bridge (SHB)

SHB 1. Site Preparation-Clearing, Grubbing & Earthwork

Construction duration from 1/11/2009 to 2/11/2009 This work will occur in stages as work areas become available.
Number of construction Workers 4 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe/excavator	NA	1	1	20	8	160	8	NA	NA	NA	NA
Pick Up	NA	1	1	20	4	80	NA	60	1	5	55
Haul Truck	NA	1	1	20	4	80	NA	50	2	4	46
Worker commute	NA	4	NA	NA	NA	NA	NA	40	1	0	40

SHB 2. Shaft and Columns - Drilled Shaft Construction

Construction duration from 2/1/2009 to 2/1/2011
Number of construction Workers 14 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**CIDH**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per CIDH**	**per CIDH**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
200 ton crane	NA	1	87	10	80	6960	8	NA	NA	NA	NA
Caisson Drill	NA	1	87	4	32	2784	8	NA	NA	NA	NA
140 ton crane	NA	1	87	7	56	4872	8	NA	NA	NA	NA
Generator	NA	2	87	10	80	13920	8	NA	NA	NA	NA
Flatbed	NA	2	87	10	80	13920	NA	50	1.5	6	44
Pick Up	NA	4	87	10	80	27840	NA	50	1.5	10	40
Concrete Truck	NA	5	87	2	16	6960	NA	32	2	2	30
Concrete Pump Truck	NA	1	87	2	16	1392	8	NA	NA	NA	NA
Compressor	NA	1	87	1	8	696	8	NA	NA	NA	NA
Water Truck	NA	1	87	4	32	2784	8	NA	NA	NA	NA
Worker commute	NA	14	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	3848	40	ft^3	290
Soil loading	333	47.5	yd^3	7

Appendix B:

Table B4: Construction Equipment Usage (Case-in-place) - Alternative 2 (continued)

SHB 3. Shaft and Columns - Footing Construction

Construction duration from 1/1/2010 to 1/20/2011

Number of construction Workers 7 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Embank. Wall**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per Wall**	**per Wall**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe/excavator	NA	1	2	5	40	80	8	NA	NA	NA	NA
140 ton crane	NA	1	2	2	16	32	8	NA	NA	NA	NA
Generator	NA	1	2	10	80	160	8	NA	NA	NA	NA
Haul Truck	NA	4	2	5	40	320	NA	50	2	4	46
Pick Up	NA	2	2	10	80	320	NA	50	1.5	10	40
Concrete Truck	NA	10	2	2	16	320	NA	32	2	2	30
Concrete Pump Truck	NA	1	2	2	16	32	8	NA	NA	NA	NA
Compressor	NA	1	2	10	80	160	8	NA	NA	NA	NA
Water Truck	NA	1	2	4	32	64	8	NA	NA	NA	NA
Worker commute	NA	7	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	2400	86	ft^3	28
Soil loading	207	30	yd^3	7

SHB 4. Shaft and Columns - Column Construction

Construction duration from 2/20/2009 to 3/1/2011

Number of construction Workers 7 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Columns**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per Col.**	**per Col.**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
140 ton crane	NA	1	87	1	8	696	8	NA	NA	NA	NA
Generator	NA	1	87	4	32	2784	8	NA	NA	NA	NA
Flatbed	NA	1	87	2.5	20	1740	NA	50	1.5	6	44
Pick Up	NA	2	87	4	32	5568	NA	50	1.5	10	40
Concrete Truck	NA	3.5	87	1	8	2436	NA	32	2	2	30
Concrete Pump Truck	NA	1	87	1	8	696	8	NA	NA	NA	NA
Compressor	NA	1	87	4	32	2784	8	NA	NA	NA	NA
Worker commute	NA	7	NA	NA	NA	NA	NA	40	1	0	40

Appendix B:

Table B4: Construction Equipment Usage (Case-in-place) - Alternative 2 (continued)

SHB 5. Falsework

Construction duration from 3/1/2009 to 7/30/2011
Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
140 ton crane	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
Generator	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
Flatbed	NA	2	20	400	3200	6400	NA	50	1.5	6	44
Pick Up	NA	4	20	400	3200	12800	NA	50	1.5	10	40
Rough Terrain (f - lift)	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
Scissor Lift	NA	2	15	300	2400	4800	8	NA	NA	NA	NA
Compressor	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
Boom	NA	2	15	300	2400	4800	8	NA	NA	NA	NA
Semi Truck	NA	10	0.5	10	20	200	NA	20	1	20	0
Loader	NA	2	1	20	160	320	8	NA	NA	NA	NA
Tug boat	NA	1	1.5	30	240	240	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

SHB 6. superstructure - Approach Span Erection

Construction duration from 7/1/2009 to 7/30/2010
Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
275 ton crane	NA	1	18	360	2880	2880	8	NA	NA	NA	NA
Rough Terrain (f-lift)	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
140 ton crane	NA	1	20	400	3200	3200	8	NA	NA	NA	NA
Generator	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
Semi Truck	NA	4	10	200	1600	6400	NA	42	1	2	40
Flatbed	NA	6	12	240	1920	11520	NA	50	1.5	6	44
Pick Up	NA	10	20	400	3200	32000	NA	50	1.5	10	40
Concrete Truck	NA	10	10	200	1600	16000	NA	32	2	2	30
Concrete Pump Truck	NA	2	10	200	1600	3200	8	NA	NA	NA	NA
Compressor	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	127340	2122	ft^3	60
Grading	2	0.1	acre	20
Soil loading	1572	79	yd^3	20

Appendix B:

Table B4: Construction Equipment Usage (Case-in-place) - Alternative 2 (continued)

SHB 7. superstructure - Main Span Erection

Construction duration from 7/1/2009 to 7/30/2011

Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
275 ton crane	NA	2	8	160	1280	2560	8	NA	NA	NA	NA
Rough Terrain (f-lift)	NA	2	10	200	1600	3200	8	NA	NA	NA	NA
140 ton crane	NA	2	10	200	1600	3200	8	NA	NA	NA	NA
Generator	NA	2	18	360	2880	5760	8	NA	NA	NA	NA
Semi Truck	NA	4	10	200	1600	6400	NA	42	1	2	40
Flatbed	NA	5	18	360	2880	14400	NA	50	1.5	6	44
Pick Up	NA	10	18	360	2880	28800	NA	50	1.5	10	40
Concrete Truck	NA	10	10	200	1600	16000	NA	32	2	2	30
Concrete Pump Truck	NA	2	10	200	1600	3200	8	NA	NA	NA	NA
Compressor	NA	2	18	360	2880	5760	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	11550	192.5	ft^3	60
Grading	1.5	0.1	acre	30
Soil loading	42.8	2	yd^3	20

SHB 8. Bridge Demolition (including both approaches)

Construction duration from 11/1/2009 to 3/30/2011

Number of construction Workers 16 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Pick Up	NA	6	6	120	3	2160	NA	50	1.5	10	40
Haul Truck	NA	10	6	120	4	4800	NA	50	2	4	46
Compressor	NA	4	6	120	8	3840	8	NA	NA	NA	NA
Generator	NA	4	6	120	6	2880	8	NA	NA	NA	NA
Flatbed	NA	4	6	120	3	1440	NA	50	1.5	6	44
Backhoe/excavator	NA	4	6	120	8	3840	8	NA	NA	NA	NA
Loader	NA	3	6	120	4	1440	8	NA	NA	NA	NA
Worker commute	NA	16	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Demolition	62500	391	ft^3	160
Excavation	40300	672	ft^4	60
Grading	2	0.1	acre	20
Soil loading	299	15	yd^3	20

Appendix B:

Table B4: Construction Equipment Usage (Case-in-place) - Alternative 2 (continued)

SHB 9. Barriers and Joints

Construction duration from 2/1/2009 to 7/30/2011

Number of construction Workers 8 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Pick Up	NA	1	6	120	480	480	NA	50	1	6	44
Concrete Truck	NA	2	6	120	960	1920	NA	32	2	2	30
Flatbed Truck	NA	1	6	120	480	480	NA	40	1	4	36
Semi Truck	NA	1	6	120	480	480	NA	42	1	2	40
Worker commute	NA	8	NA	NA	NA	NA	NA	40	1	0	40

SHB 10. Stripping, Lighting, and Signing

Construction duration from 9/1/2009 to 8/30/2011

Number of construction Workers 10 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Pick Up	NA	4	2	40	3	480	NA	50	1.5	10	40
Paint truck	NA	1	1.5	30	7	210	8	NA	NA	NA	NA
Compressor	NA	1	1.5	30	7	210	8	NA	NA	NA	NA
Bucket Truck	NA	2	2	40	5	400	8	NA	NA	NA	NA
Semi Truck	NA	2	0.5	10	4	80	NA	42	1	2	40
Boom Truck	NA	1	0.5	10	6	60	8	NA	NA	NA	NA
Worker commute	NA	10	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
excavation	11781	589	ft^3	20

Appendix B:

Table B4: Construction Equipment Usage (Case-in-place) - Alternative 2 (continued)
SR-103 Truck Expressway

SR-103 1. Site Preparation - Earthwork

Construction duration from 2/1/2009 to 9/1/2009
Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Loader	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Haulers (Truck)	NA	6	4	80	640	3840	NA	50	2	4	46
Generator	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Flatbed	NA	2	6	120	960	1920	NA	50	1.5	6	44
Pick Up	NA	6	6	120	960	5760	NA	50	1.5	10	40
Grader	NA	2	3	60	480	960	8	NA	NA	NA	NA
Vibratory loader	NA	2	3	60	480	960	8	NA	NA	NA	NA
Asphalt Paver	NA	1	2	40	320	320	8	NA	NA	NA	NA
Compressor	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Water Truck	NA	1	5	100	800	800	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

SR-103 2. Site Preparation - Drilled Shaft Construction

Construction duration from 3/1/2009 to 2/1/2011
Number of construction Workers 14 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**CIDH**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per CIDH**	**per CIDH**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
200 ton crane	NA	1	261	10	80	20880	8	NA	NA	NA	NA
Caisson Drill	NA	1	261	4	32	8352	8	NA	NA	NA	NA
140 ton crane	NA	1	261	7	56	14616	8	NA	NA	NA	NA
Generator	NA	2	261	10	80	41760	8	NA	NA	NA	NA
Flatbed	NA	2	261	10	80	41760	NA	50	1.5	6	44
Pick Up	NA	4	261	10	80	83520	NA	50	1.5	10	40
Concrete Truck	NA	5	261	2	16	20880	NA	32	2	2	30
Concrete Pump Truck	NA	1	261	2	16	4176	8	NA	NA	NA	NA
Compressor	NA	1	261	1	8	2088	8	NA	NA	NA	NA
Water Truck	NA	1	261	4	32	8352	8	NA	NA	NA	NA
Worker commute	NA	14	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Demolition	29518	492	ft^3	60
Excavation	35422	590	ft^3	60
Grading	2	0.1	acre	20
Soil Loading	91	5	yd^3	20

Appendix B:

Table B4: Construction Equipment Usage (Case-in-place) - Alternative 2 (continued)

SR-103 3. Foundation Construction

Construction duration from 10/1/2009 to 11/1/2009
Number of construction Workers 7 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe/excavator	NA	1	1	20	160	160	8	NA	NA	NA	NA
140 ton crane	NA	1	0.5	10	80	40	8	NA	NA	NA	NA
Generator	NA	1	1	20	160	160	8	NA	NA	NA	NA
Haul Truck	NA	4	0.5	10	80	160	NA	50	2	4	46
Pick Up	NA	3	1	20	160	480	NA	50	1.5	10	40
Concrete Truck	NA	1	0.25	5	40	10	NA	32	2	2	30
Concrete Pump Truck	NA	1	0.25	5	40	10	8	NA	NA	NA	NA
Compressor	NA	1	0.5	10	80	40	8	NA	NA	NA	NA
Water Truck	NA	1	0.5	10	80	40	8	NA	NA	NA	NA
Pile Driver	NA	2	1	20	160	320	8	NA	NA	NA	NA
Worker commute	NA	7	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	408	81.6	ft^3	5
Soil Loading	3.0	0.6	yd^3	5

SR-103 4. Column Construction

Construction duration from 2/20/2009 to 4/1/2011
Number of construction Workers 7 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Columns**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per Col.**	**per Col.**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
140 ton crane	NA	1	261	1	8	2088	8	NA	NA	NA	NA
Generator	NA	1	261	4	32	8352	8	NA	NA	NA	NA
Flatbed	NA	2	261	2	16	8352	NA	50	1.5	6	44
Pick Up	NA	4	261	4	32	33408	NA	50	1.5	10	40
Concrete Truck	NA	2	261	1	8	4176	NA	32	2	2	30
Concrete Pump Truck	NA	1	261	1	8	2088	8	NA	NA	NA	NA
Compressor	NA	1	261	4	32	8352	8	NA	NA	NA	NA
Worker commute	NA	7	NA	NA	NA	NA	NA	40	1	0	40

Appendix B:

Table B4: Construction Equipment Usage (Case-in-place) - Alternative 2 (continued)

SR-103 5. Falsework

Construction duration from 3/1/2009 to 7/30/2011
Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
100 ton crane	NA	1	30	600	4800	4800	8	NA	NA	NA	NA
Generator	NA	2	30	600	4800	9600	8	NA	NA	NA	NA
Flatbed	NA	2	30	600	4800	9600	NA	50	1.5	6	44
Pick Up	NA	4	30	600	4800	19200	NA	50	1.5	10	40
Rough Terrain (f - lift)	NA	4	30	600	4800	19200	8	NA	NA	NA	NA
Scissor Lift	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
Compressor	NA	2	30	600	4800	9600	8	NA	NA	NA	NA
Boom	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

SR-103 6. Superstructure - Span Erection

Construction duration from 7/1/2009 to 7/30/2011
Number of construction Workers 25 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
275 ton crane	NA	1	18	360	2880	2880	8	NA	NA	NA	NA
Rough Terrain (f-lift)	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
140 ton crane	NA	1	20	400	3200	3200	8	NA	NA	NA	NA
Generator	NA	4	18	360	2880	11520	8	NA	NA	NA	NA
Semi Truck	NA	4	16	320	2560	10240	NA	42	1	2	40
Flatbed	NA	4	20	400	3200	12800	NA	50	1.5	6	44
Pick Up	NA	10	20	400	3200	32000	NA	50	1.5	10	40
Concrete Truck	NA	12	9	180	1440	17280	NA	32	2	2	30
Concrete Pump Truck	NA	4	9	180	1440	5760	8	NA	NA	NA	NA
Compressor	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
Worker commute	NA	25	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Demolition	120000	12000	ft^3	10
Excavation	12000	1200	ft^3	10
grading	1.5	0.3	acre	5
paving	1.5	0.15	acre	10

Appendix B:

Table B4: Construction Equipment Usage (Case-in-place) - Alternative 2 (continued)

SR-103 7. Drainage

Construction duration from 3/1/2009 to 3/1/2011

Number of construction Workers 12 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe	NA	1	6	120	960	960	8	NA	NA	NA	NA
Loader	NA	1	6	120	960	960	8	NA	NA	NA	NA
Haulers (Truck)	NA	2	2	40	320	640	NA	50	2	4	46
Generator	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Flatbed	NA	4	6	120	960	3840	NA	50	1.5	6	44
Pick Up	NA	4	6	120	960	3840	NA	50	1.5	10	40
Vibratory Roller	NA	2	3	60	480	960	8	NA	NA	NA	NA
Compressor	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Water Truck	NA	1	3	60	480	480	8	NA	NA	NA	NA
Concrete Truck	NA	1	1	20	160	160	NA	32	2	2	30
Worker commute	NA	12	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Demolition	105600	660	ft^3	160
Excavation	73920	616	ft^4	120
grading	2	0.10	acre	20
Paving	2	0.07	acre	30
Soil dumping	10	0.5	yd^3	60

SR-103 8. Retaining Walls and Soundwalls - - MSE Walls at Ramps and Touchdowns

Construction duration from 7/1/2009 to 12/30/2009

Number of construction Workers 11 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Loader	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Haulers (Truck)	NA	4	5	100	800	3200	NA	50	2	4	46
Generator	NA	1	6	120	960	960	8	NA	NA	NA	NA
Flatbed	NA	2	4	80	640	1280	NA	50	1.5	6	44
Pick Up	NA	2	6	120	960	1920	NA	50	1.5	10	40
Vibratory Roller	NA	2	3	60	480	960	8	NA	NA	NA	NA
Compressor	NA	1	6	120	960	960	8	NA	NA	NA	NA
Water Truck	NA	1	4	80	640	640	8	NA	NA	NA	NA
Concrete Truck	NA	2	1	20	160	320	NA	32	2	2	30
Worker commute	NA	11	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	100000	2500	ft^3	40
Grading	2	0.2	acre	10
Soil Loading	231	23	yd^3	10

Appendix B:

Table B4: Construction Equipment Usage (Case-in-place) - Alternative 2 (continued)

SR-103 9. Striping, Lighting and Signing

Construction duration from 7/1/2009 to 8/30/2011

Number of construction Workers 14 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Boom	NA	4	4	80	640	2560	8	NA	NA	NA	NA
Loader	NA	1	2	40	320	320	8	NA	NA	NA	NA
Generator	NA	3	6	120	960	2880	8	NA	NA	NA	NA
Flatbed	NA	2	6	120	960	1920	NA	50	1.5	6	44
Pick Up	NA	6	6	120	960	5760	NA	50	1.5	10	40
Compressor	NA	3	6	120	960	2880	8	NA	NA	NA	NA
Striper (Truck)	NA	1	4	80	640	640	8	NA	NA	NA	NA
Worker commute	NA	14	NA	NA	NA	NA	NA	40	1	0	40
	Total Amount	**Daily Amount**	**Unit**	**duration**							
Excavation	29452	982	ft^3	30							

SHB and SR-103: Stockpile Area

Construction duration from 1/11/2009 to 8/30/2011

	Maximum Area Covered	Unit
Stock Piles	2	acres/day

1. Construction data provided by DMJM Harris, May 2005
2. Stock pile areas were not specified for each construction phases. The maximum areas that might be covered each day by the whole project was used to calculate the total fugitive dust emissions from stock piles.
3. Please refer to Appendix A1 for details of flyover construction emission calculations.

Appendix B:

Table B5: Emission Factors (Case-in-place) - Alternative 2

SHB 1. Site Preparation-Clearing, Grubbing & Earthwork

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe/excavator	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.05590	0.000	0.051	0.000
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Haul Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211

SHB 2. Shaft and Columns - Drilled Shaft Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
200 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.06780	0.000	0.062	0.000
Caisson Drill	Bore/Drill Rigs	2009	lb/hr	0.520	1.229	0.116	0.002	0.05406	0.000	0.050	0.000
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.06780	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.04139	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.05465	0.000	0.050	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Soil loading	Soil loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

Appendix B:

Table B5: Emission Factors (Case-in-place) - Alternative 2 (continued)

SHB 3. Shaft and Columns - Footing Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe/excavator	Tractors/Loaders/Backhoes	2010	lb/hr	0.393	0.675	0.102	0.001	0.05205	0.000	0.048	0.000
140 ton crane	Cranes	2010	lb/hr	0.543	1.451	0.159	0.001	0.06422	0.000	0.059	0.000
Generator	Generator Sets	2010	lb/hr	0.329	0.644	0.096	0.001	0.03963	0.000	0.036	0.000
Haul Truck	On-road Delivery	2010	lb/VMT	0.018	0.021	0.003	0.00003	0.00075	0.997	0.001	0.211
Pick Up	On-road passenger	2010	lb/VMT	0.008	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2010	lb/VMT	0.018	0.021	0.003	0.00003	0.00075	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2010	lb/hr	0.743	2.388	0.248	0.003	0.08751	0.000	0.081	0.000
Compressor	Air compressor	2010	lb/hr	0.361	0.732	0.112	0.001	0.05264	0.000	0.048	0.000
Water Truck	Off-Highway Trucks	2010	lb/hr	0.743	2.388	0.248	0.003	0.08751	0.000	0.081	0.000
Worker commute	On-road passenger	2010	lb/VMT	0.008	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2010	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Soil loading	Soil loading	2010	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

SHB 4. Shaft and Columns - Column Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.06780	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.04139	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.05465	0.000	0.050	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211

Appendix B:

Table B5: Emission Factors (Case-in-place) - Alternative 2 (continued)

SHB 5. Falsework

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.06780	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.04139	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Rough Terrain (f - lift)	Rough Terrain Forklifts	2009	lb/hr	0.482	0.851	0.137	0.001	0.07185	0.000	0.066	0.000
Scissor Lift	Other Construction Equipmer	2009	lb/hr	0.429	1.081	0.113	0.001	0.04709	0.000	0.043	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.05465	0.000	0.050	0.000
Boom	Other Construction Equipmer	2009	lb/hr	0.429	1.081	0.113	0.001	0.04709	0.000	0.043	0.000
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.00200	1.861	0.002	0.395
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.05590	0.000	0.051	0.000
Tug boat	Ship	2009	lb/VMT	5.878	23.677	0.893	0.016	0.616	0.000	0.567	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211

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Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
275 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.06780	0.000	0.062	0.000
Rough Terrain (f-lift)	Rough Terrain Forklifts	2009	lb/hr	0.482	0.851	0.137	0.001	0.07185	0.000	0.066	0.000
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.06780	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.04139	0.000	0.038	0.000
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.00200	1.861	0.002	0.395
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.05465	0.000	0.050	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Soil loading	Soil loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

Appendix B:

Table B5: Emission Factors (Case-in-place) - Alternative 2 (continued)

SHB 7. superstructure - Main Span Erection

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
275 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.06780	0.000	0.062	0.000
Rough Terrain (f-lift)	Rough Terrain Forklifts	2009	lb/hr	0.482	0.851	0.137	0.001	0.07185	0.000	0.066	0.000
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.06780	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.04139	0.000	0.038	0.000
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.00200	1.861	0.002	0.395
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.05465	0.000	0.050	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Soil loading	Soil loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

SHB 8. Bridge Demolition (including both approaches)

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Haul Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.05465	0.000	0.050	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.04139	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Backhoe/excavator	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.05590	0.000	0.051	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.05590	0.000	0.051	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Demolition	Demolition	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.00009
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.00009
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Soil loading	Soil loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

Appendix B:

Table B5: Emission Factors (Case-in-place) - Alternative 2 (continued)

SHB 9. Barriers and Joints

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.9973	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.9973	0.001	0.211
Flatbed Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.9973	0.001	0.211
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.00200	1.8611	0.002	0.395
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.9973	0.000	0.211

SHB 10. Stripping, Lighting, and Signing

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Paint truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.05465	0.000	0.050	0.000
Bucket Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.00200	1.861	0.002	0.395
Boom Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000

Appendix B:

Table B5: Emission Factors (Case-in-place) - Alternative 2 (continued)

SR-103 1. Site Preparation - Earthwork

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Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.05590	0.000	0.051	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.05590	0.000	0.051	0.000
Haulers (Truck)	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.04139	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Grader	Graders	2009	lb/hr	0.643	1.524	0.183	0.001	0.07958	0.000	0.073	0.000
Vibratory loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.05590	0.000	0.051	0.000
Asphalt Paver	Pavers	2009	lb/hr	0.576	1.032	0.187	0.001	0.07388	0.000	0.068	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.05465	0.000	0.050	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211

SR-103 2. Site Preparation - Drilled Shaft Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
200 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.06780	0.000	0.062	0.000
Caisson Drill	Bore/Drill Rigs	2009	lb/hr	0.520	1.229	0.116	0.002	0.05406	0.000	0.050	0.000
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.06780	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.04139	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.05465	0.000	0.050	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Demolition	Demolition	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Soil Loading	Soil Loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

Appendix B:

Table B5: Emission Factors (Case-in-place) - Alternative 2 (continued)

SR-103 3. Foundation Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe/excavator	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.05590	0.000	0.051	0.000
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.06780	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.04139	0.000	0.038	0.000
Haul Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.05465	0.000	0.050	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Pile Driver	Other Construction Equipmer	2009	lb/hr	0.429	1.081	0.113	0.001	0.04709	0.000	0.043	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Soil Loading	Soil Loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

SR-103 4. Column Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.06780	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.04139	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.05465	0.000	0.050	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211

Appendix B:

Table B5: Emission Factors (Case-in-place) - Alternative 2 (continued)

SR-103 5. Falsework

Emission Factors (see Appendix I for details and reference of emission factors)

Equipment Description	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
100 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.06780	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.04139	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Rough Terrain (f - lift)	Rough Terrain Forklifts	2009	lb/hr	0.482	0.851	0.137	0.001	0.07185	0.000	0.066	0.000
Scissor Lift	Other Construction Equipmer	2009	lb/hr	0.429	1.081	0.113	0.001	0.04709	0.000	0.043	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.05465	0.000	0.050	0.000
Boom	Other Construction Equipmer	2009	lb/hr	0.429	1.081	0.113	0.001	0.04709	0.000	0.043	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211

SR-103 6. Superstructure - Span Erection

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
275 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.06780	0.000	0.062	0.000
Rough Terrain (f-lift)	Rough Terrain Forklifts	2009	lb/hr	0.482	0.851	0.137	0.001	0.07185	0.000	0.066	0.000
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.06780	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.04139	0.000	0.038	0.000
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.00200	1.861	0.002	0.395
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.05465	0.000	0.050	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Demolition	Demolition	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
grading	grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
paving	paving	2009	lb ROG / acre	0.000	0.000	2.620	0.000	0.000	0.000	0.000	0.000

Appendix B:

Table B5: Emission Factors (Case-in-place) - Alternative 2 (continued)

SR-103 7. Drainage

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.05590	0.000	0.051	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.05590	0.000	0.051	0.000
Haulers (Truck)	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.04139	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Vibratory Roller	Rollers	2009	lb/hr	0.427	0.817	0.125	0.001	0.05738	0.000	0.053	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.05465	0.000	0.050	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Demolition	Demolition	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
grading	grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Paving	Paving	2009	lb ROG / acre	0.000	0.000	2.620	0.000	0.000	0.000	0.000	0.000
Soil dumping	Soil dumping	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.016	0.000	0.003

SR-103 8. Retaining Walls and Soundwalls - - MSE Walls at Ramps and Touchdowns

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.05590	0.000	0.051	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.05590	0.000	0.051	0.000
Haulers (Truck)	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.04139	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Vibratory Roller	Rollers	2009	lb/hr	0.427	0.817	0.125	0.001	0.05738	0.000	0.053	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.05465	0.000	0.050	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.0004	0.000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Soil Loading	Soil Loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

Appendix B:

Table B5: Emission Factors (Case-in-place) - Alternative 2 (continued)

SR-103 9. Striping, Lighting and Signing

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Boom	Other Construction Equipmer	2009	lb/hr	0.429	1.081	0.113	0.001	0.04709	0.000	0.043	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.05590	0.000	0.051	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.04139	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.05465	0.000	0.050	0.000
Striper (Truck)	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

SHB and SR-103: Stockpile Area

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Stock piles	Stock piles	All	lb/acre/day	0.000	0.000	0.000	0.000	0.000	39.908	0.000	8.301

Note:

1. Stock pile areas were not specified or calculated for each construction phases. The maximum areas that might be covered each day by the whole project was used to calculate the total fugitive dust emissions from stock piles.
2. Detailed references of the emission factors are in Appendix I.

Appendix B:

Table B6: Daily Emissions (Case-in-place) - Alternative 2

SHB 1. Site Preparation-Clearing, Grubbing & Earthwork

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
Pick Up	0.581	0.060	0.060	0.001	0.005	4.987	0.003	1.057
Haul Truck	2.016	2.237	0.279	0.003	0.081	3.989	0.069	0.846
Worker commute	1.550	0.161	0.159	0.002	0.014	0.000	0.009	0.000
Total	7.341	8.239	1.384	0.011	0.547	8.976	0.493	1.903

SHB 1. Site Preparation-Clearing, Grubbing & Earthwork

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.1943	5.7812	0.8869	0.0062	0.4472	0.0000	0.4114	0.0000
Pick Up	0.5811	0.0603	0.0595	0.0006	0.0052	2.7427	0.0032	0.5814
Haul Truck	2.0161	2.2366	0.2789	0.0027	0.0805	2.1941	0.0692	0.4652
Worker commute	1.5497	0.1608	0.1588	0.0017	0.0138	0.0000	0.0086	0.0000
Total	7.3412	8.2390	1.3841	0.0112	0.5467	4.9368	0.4925	1.0466

SHB 2. Shaft and Columns - Drilled Shaft Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
200 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Caisson Drill	4.160	9.830	0.929	0.014	0.432	0.000	0.398	0.000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Concrete Truck	6.451	7.157	0.892	0.009	0.258	9.973	0.222	2.114
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.000	0.030	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.017	0.000	0.003
Soil loading	0.000	0.000	0.000	0.000	0.000	1.886	0.000	0.392
Total	52.147	103.364	12.517	0.117	4.556	63.737	4.146	13.505

SHB 2. Shaft and Columns - Drilled Shaft Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
200 ton crane	4.564	12.235	1.347	0.011	0.542	0.0000	0.4990	0.0000
Caisson Drill	4.160	9.830	0.929	0.014	0.432	0.0000	0.3979	0.0000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.0000	0.4990	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.0000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.5824	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.9413	0.0162	4.6516
Concrete Truck	6.451	7.157	0.892	0.009	0.258	5.4853	0.2215	1.1629
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.0000	0.6837	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.0000	0.4022	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.0000	0.6837	0.0000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.0000	0.0302	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.0054	0.0000	0.0011
Soil loading	0.000	0.000	0.000	0.000	0.000	0.6034	0.0000	0.1255
Total	52.147	103.364	12.517	0.117	4.556	34.618	4.146	7.337

Appendix B:

Table B6: Daily Emissions (Case-in-place) - Alternative 2 (continued)

SHB 3. Shaft and Columns - Footing Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.144	5.398	0.816	0.006	0.416	0.000	0.383	0.000
140 ton crane	4.345	11.612	1.275	0.011	0.514	0.000	0.473	0.000
Generator	2.634	5.152	0.769	0.006	0.317	0.000	0.292	0.000
Haul Truck	7.375	8.250	1.036	0.011	0.300	15.957	0.257	3.383
Pick Up	1.239	0.138	0.137	0.002	0.013	19.947	0.008	4.229
Concrete Truck	11.800	13.200	1.657	0.017	0.481	19.947	0.411	4.229
Concrete Pump Truck	5.943	19.108	1.984	0.021	0.700	0.000	0.644	0.000
Compressor	2.890	5.856	0.896	0.006	0.421	0.000	0.387	0.000
Water Truck	5.943	19.108	1.984	0.021	0.700	0.000	0.644	0.000
Worker commute	2.314	0.257	0.256	0.003	0.024	0.000	0.015	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.036	0.000	0.007
Soil loading	0.000	0.000	0.000	0.000	0.000	1.176	0.000	0.245
Total	47.628	88.079	10.811	0.104	3.887	57.063	3.515	12.092

SHB 3. Shaft and Columns - Footing Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.144	5.398	0.816	0.006	0.416	0.0000	0.3831	0.0000
140 ton crane	4.345	11.612	1.275	0.011	0.514	0.0000	0.4726	0.0000
Generator	2.634	5.152	0.769	0.006	0.317	0.0000	0.2917	0.0000
Haul Truck	7.375	8.250	1.036	0.011	0.300	8.7765	0.2569	1.8606
Pick Up	1.239	0.138	0.137	0.002	0.013	10.9707	0.0082	2.3258
Concrete Truck	11.800	13.200	1.657	0.017	0.481	10.9707	0.4111	2.3258
Concrete Pump Truck	5.943	19.108	1.984	0.021	0.700	0.0000	0.6441	0.0000
Compressor	2.890	5.856	0.896	0.006	0.421	0.0000	0.3874	0.0000
Water Truck	5.943	19.108	1.984	0.021	0.700	0.0000	0.6441	0.0000
Worker commute	2.314	0.257	0.256	0.003	0.024	0.0000	0.0153	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.0115	0.0000	0.0024
Soil loading	0.000	0.000	0.000	0.000	0.000	0.3763	0.0000	0.0783
Total	47.628	88.079	10.811	0.104	3.887	31.106	3.515	6.593

SHB 4. Shaft and Columns - Column Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.305	0.000
Flatbed	1.512	1.677	0.209	0.002	0.060	5.984	0.052	1.269
Pick Up	1.453	0.151	0.149	0.002	0.013	19.947	0.008	4.229
Concrete Truck	4.516	5.010	0.625	0.006	0.180	6.981	0.155	1.480
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.015	0.000
Total	26.764	51.264	6.444	0.056	2.332	32.912	2.120	6.977

SHB 4. Shaft and Columns - Column Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.3046	0.0000
Flatbed	1.512	1.677	0.209	0.002	0.060	3.291	0.0519	0.6977
Pick Up	1.453	0.151	0.149	0.002	0.013	10.971	0.0081	2.3258
Concrete Truck	4.516	5.010	0.625	0.006	0.180	3.840	0.1551	0.8140
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.4022	0.0000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.0151	0.0000
Total	26.764	51.264	6.444	0.056	2.332	18.102	2.120	3.838

Appendix B:

Table B6: Daily Emissions (Case-in-place) - Alternative 2 (continued)

SHB 5. Falsework

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.998	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Rough Terrain (f - lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.115	0.000
Scissor Lift	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Boom	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Semi Truck	2.564	8.369	0.659	0.008	0.399	372.218	0.350	78.910
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Tug boat	47.028	189.413	7.146	0.128	4.928	0.000	4.534	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Total	117.315	322.900	25.096	0.273	12.847	424.079	11.773	89.905

SHB 5. Falsework

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.9980	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Rough Terrain (f - lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.1153	0.0000
Scissor Lift	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.8045	0.0000
Boom	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Semi Truck	2.564	8.369	0.659	0.008	0.399	204.720	0.3505	43.4006
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Tug boat	47.028	189.413	7.146	0.128	4.928	0.000	4.5337	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.0323	0.0000
Total	117.315	322.900	25.096	0.273	12.847	233.244	11.773	49.448

SHB 6. superstructure - Approach Span Erection

0

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Rough Terrain (f-lift)	7.704	13.608	2.188	0.013	1.150	0.000	1.058	0.000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.219	0.000
Semi Truck	2.154	7.030	0.553	0.007	0.335	14.889	0.294	3.156
Flatbed	9.072	10.065	1.255	0.012	0.362	35.904	0.312	7.612
Pick Up	7.264	0.754	0.744	0.008	0.065	99.733	0.040	21.143
Concrete Truck	12.903	14.314	1.785	0.017	0.516	19.947	0.443	4.229
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.609	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.891	0.000	0.185
Grading	0.000	0.000	0.000	0.000	0.000	2.640	0.000	0.549
Soil loading	0.000	0.000	0.000	0.000	0.000	3.120	0.000	0.649
Total	89.374	157.675	21.008	0.173	8.123	177.124	7.372	37.524

SHB 6. superstructure - Approach Span Erection

0

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Rough Terrain (f-lift)	7.704	13.608	2.188	0.013	1.150	0.000	1.0576	0.0000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.2185	0.0000
Semi Truck	2.154	7.030	0.553	0.007	0.335	8.189	0.2944	1.7360
Flatbed	9.072	10.065	1.255	0.012	0.362	19.747	0.3115	4.1864
Pick Up	7.264	0.754	0.744	0.008	0.065	54.853	0.0404	11.6289
Concrete Truck	12.903	14.314	1.785	0.017	0.516	10.971	0.4431	2.3258
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.3674	0.0000
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.6090	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.0323	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.285	0.0000	0.0593
Grading	0.000	0.000	0.000	0.000	0.000	0.845	0.0000	0.1757
Soil loading	0.000	0.000	0.000	0.000	0.000	0.998	0.0000	0.2077
Total	89.374	157.675	21.008	0.173	8.123	95.888	7.372	20.320

Appendix B:

Table B6: Daily Emissions (Case-in-place) - Alternative 2 (continued)

SHB 7. superstructure - Main Span Erection

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.998	0.000
Rough Terrain (f-lift)	7.704	13.608	2.188	0.013	1.150	0.000	1.058	0.000
140 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.998	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Semi Truck	2.154	7.030	0.553	0.007	0.335	14.889	0.294	3.156
Flatbed	7.560	8.387	1.046	0.010	0.302	29.920	0.260	6.343
Pick Up	7.264	0.754	0.744	0.008	0.065	99.733	0.040	21.143
Concrete Truck	12.903	14.314	1.785	0.017	0.516	19.947	0.443	4.229
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.081	0.000	0.017
Grading	0.000	0.000	0.000	0.000	0.000	1.320	0.000	0.275
Soil loading	0.000	0.000	0.000	0.000	0.000	0.085	0.000	0.018
Total	85.667	157.456	19.973	0.171	7.611	165.974	6.905	35.181

SHB 7. superstructure - Main Span Erection

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.9980	0.0000
Rough Terrain (f-lift)	7.704	13.608	2.188	0.013	1.150	0.000	1.0576	0.0000
140 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.9980	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Semi Truck	2.154	7.030	0.553	0.007	0.335	8.189	0.2944	1.7360
Flatbed	7.560	8.387	1.046	0.010	0.302	16.456	0.2596	3.4887
Pick Up	7.264	0.754	0.744	0.008	0.065	54.853	0.0404	11.6289
Concrete Truck	12.903	14.314	1.785	0.017	0.516	10.971	0.4431	2.3258
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.3674	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.8045	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.0323	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.026	0.0000	0.0054
Grading	0.000	0.000	0.000	0.000	0.000	0.422	0.0000	0.0879
Soil loading	0.000	0.000	0.000	0.000	0.000	0.027	0.0000	0.0057
Total	85.667	157.456	19.973	0.171	7.611	90.944	6.905	19.278

SHB 8. Bridge Demolition (including both approaches)

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	4.359	0.452	0.447	0.005	0.039	59.840	0.024	12.686
Haul Truck	20.161	22.366	2.789	0.027	0.805	39.893	0.692	8.457
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.609	0.000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.219	0.000
Flatbed	6.048	6.710	0.837	0.008	0.242	23.936	0.208	5.074
Backhoe/excavator	12.777	23.125	3.547	0.025	1.789	0.000	1.646	0.000
Loader	9.583	17.344	2.661	0.019	1.342	0.000	1.234	0.000
Worker commute	6.199	0.643	0.635	0.007	0.055	0.000	0.034	0.000
Demolition	0.000	0.000	0.000	0.000	0.000	0.164	0.000	0.034
Excavation	0.000	0.000	0.000	0.000	0.000	0.282	0.000	0.059
Grading	0.000	0.000	0.000	0.000	0.000	2.640	0.000	0.549
Soil loading	0.000	0.000	0.000	0.000	0.000	0.592	0.000	0.123
Total	81.775	116.663	17.954	0.135	7.345	127.348	6.666	26.983

SHB 8. Bridge Demolition (including both approaches)

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	4.359	0.452	0.447	0.005	0.039	32.912	0.0242	6.9773
Haul Truck	20.161	22.366	2.789	0.027	0.805	21.941	0.6923	4.6516
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.6090	0.0000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.2185	0.0000
Flatbed	6.048	6.710	0.837	0.008	0.242	13.165	0.2077	2.7909
Backhoe/excavator	12.777	23.125	3.547	0.025	1.789	0.000	1.6457	0.0000
Loader	9.583	17.344	2.661	0.019	1.342	0.000	1.2343	0.0000
Worker commute	6.199	0.643	0.635	0.007	0.055	0.000	0.0345	0.0000
Demolition	0.000	0.000	0.000	0.000	0.000	0.053	0.0000	0.0109
Excavation	0.000	0.000	0.000	0.000	0.000	0.090	0.0000	0.0188
Grading	0.000	0.000	0.000	0.000	0.000	0.845	0.0000	0.1757
Soil loading	0.000	0.000	0.000	0.000	0.000	0.190	0.0000	0.0394
Total	81.775	116.663	17.954	0.135	7.345	69.195	6.666	14.665

Appendix B:

Table B6: Daily Emissions (Case-in-place) - Alternative 2 (continued)

SHB 9. Barriers and Joints

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	0.484	0.050	0.050	0.001	0.004	5.984	0.003	1.269
Concrete Truck	2.581	2.863	0.357	0.003	0.103	3.989	0.089	0.846
Flatbed Truck	0.806	0.895	0.112	0.001	0.032	3.989	0.028	0.846
Semi Truck	0.539	1.758	0.138	0.002	0.084	3.722	0.074	0.789
Worker commute	3.099	0.322	0.318	0.003	0.028	0.000	0.017	0.000
Total	7.509	5.887	0.974	0.010	0.251	17.685	0.210	3.749

SHB 9. Barriers and Joints

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	0.484	0.050	0.050	0.001	0.004	3.291	0.0027	0.6977
Concrete Truck	2.581	2.863	0.357	0.003	0.103	2.194	0.0886	0.4652
Flatbed Truck	0.806	0.895	0.112	0.001	0.032	2.194	0.0277	0.4652
Semi Truck	0.539	1.758	0.138	0.002	0.084	2.047	0.0736	0.4340
Worker commute	3.099	0.322	0.318	0.003	0.028	0.000	0.0172	0.0000
Total	7.509	5.887	0.974	0.010	0.251	9.727	0.210	2.062

SHB 10. Stripping, Lighting, and Signing

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Paint truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Bucket Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Semi Truck	1.077	3.515	0.277	0.003	0.168	7.444	0.147	1.578
Boom Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	3.874	0.402	0.397	0.004	0.034	0.000	0.022	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.247	0.000	0.051
Total	36.194	91.966	10.225	0.102	3.638	47.585	3.322	10.087

SHB 10. Stripping, Lighting, and Signing

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Paint truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.4022	0.0000
Bucket Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.3674	0.0000
Semi Truck	1.077	3.515	0.277	0.003	0.168	4.094	0.1472	0.8680
Boom Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Worker commute	3.874	0.402	0.397	0.004	0.034	0.000	0.0215	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.079	0.0000	0.0165
Total	36.194	91.966	10.225	0.102	3.638	26.115	3.322	5.536

Appendix B:

Table B6: Daily Emissions (Case-in-place) - Alternative 2 (continued)

SR-103 1. Site Preparation - Earthwork

0

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Haulers (Truck)	12.096	13.420	1.673	0.016	0.483	23.936	0.415	5.074
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	4.359	0.452	0.447	0.005	0.039	59.840	0.024	12.686
Grader	10.285	24.380	2.920	0.024	1.273	0.000	1.171	0.000
Vibratory loader	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Asphalt Paver	4.605	8.257	1.494	0.007	0.591	0.000	0.544	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Total	77.015	128.570	18.466	0.143	7.522	95.744	6.857	20.298

SR-103 1. Site Preparation - Earthwork

0

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Haulers (Truck)	12.096	13.420	1.673	0.016	0.483	13.165	0.4154	2.7909
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	4.359	0.452	0.447	0.005	0.039	32.912	0.0242	6.9773
Grader	10.285	24.380	2.920	0.024	1.273	0.000	1.1714	0.0000
Vibratory loader	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Asphalt Paver	4.605	8.257	1.494	0.007	0.591	0.000	0.5437	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.8045	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.0323	0.0000
Total	77.015	128.570	18.466	0.143	7.522	52.659	6.857	11.164

SR-103 2. Site Preparation - Drilled Shaft Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
200 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Caisson Drill	4.160	9.830	0.929	0.014	0.432	0.000	0.398	0.000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Concrete Truck	6.451	7.157	0.892	0.009	0.258	9.973	0.222	2.114
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.000	0.030	0.000
Demolition	0.000	0.000	0.000	0.000	0.000	0.207	0.000	0.043
Excavation	0.000	0.000	0.000	0.000	0.000	0.248	0.000	0.052
Grading	0.000	0.000	0.000	0.000	0.000	2.640	0.000	0.549
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.181	0.000	0.038
Total	52.147	103.364	12.517	0.117	4.556	65.110	4.146	13.790

SR-103 2. Site Preparation - Drilled Shaft Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
200 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Caisson Drill	4.160	9.830	0.929	0.014	0.432	0.000	0.3979	0.0000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Concrete Truck	6.451	7.157	0.892	0.009	0.258	5.485	0.2215	1.1629
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.4022	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.000	0.0302	0.0000
Demolition	0.000	0.000	0.000	0.000	0.000	0.066	0.0000	0.0138
Excavation	0.000	0.000	0.000	0.000	0.000	0.079	0.0000	0.0165
Grading	0.000	0.000	0.000	0.000	0.000	0.845	0.0000	0.1757
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.058	0.0000	0.0120
Total	52.147	103.364	12.517	0.117	4.556	35.057	4.146	7.428

Appendix B:

Table B6: Daily Emissions (Case-in-place) - Alternative 2 (continued)

SR-103 3. Foundation Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.305	0.000
Haul Truck	8.064	8.947	1.116	0.011	0.322	15.957	0.277	3.383
Pick Up	2.179	0.226	0.223	0.002	0.019	29.920	0.012	6.343
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.995	0.044	0.423
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Pile Driver	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.015	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.034	0.000	0.007
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.024	0.000	0.005
Total	47.221	98.515	11.752	0.109	4.415	47.930	4.026	10.161

SR-103 3. Foundation Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.194	5.781	0.887	0.006	0.447	0.000	0.4114	0.0000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.3046	0.0000
Haul Truck	8.064	8.947	1.116	0.011	0.322	8.777	0.2769	1.8606
Pick Up	2.179	0.226	0.223	0.002	0.019	16.456	0.0121	3.4887
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.097	0.0443	0.2326
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.4022	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Pile Driver	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.0151	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.011	0.0000	0.0023
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.008	0.0000	0.0016
Total	47.221	98.515	11.752	0.109	4.415	26.348	4.026	5.586

SR-103 4. Column Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.305	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Concrete Truck	2.581	2.863	0.357	0.003	0.103	3.989	0.089	0.846
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.015	0.000
Total	27.793	50.945	6.535	0.057	2.328	55.851	2.113	11.840

SR-103 4. Column Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.3046	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Concrete Truck	2.581	2.863	0.357	0.003	0.103	2.194	0.0886	0.4652
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.4022	0.0000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.0151	0.0000
Total	27.793	50.945	6.535	0.057	2.328	30.718	2.113	6.512

Appendix B:

Table B6: Daily Emissions (Case-in-place) - Alternative 2 (continued)

SR-103 5. Falsework

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
100 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Rough Terrain (f - lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.115	0.000
Scissor Lift	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Boom	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Total	56.770	101.321	14.171	0.114	6.083	51.861	5.567	10.995

SR-103 5. Falsework

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
100 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Rough Terrain (f - lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.1153	0.0000
Scissor Lift	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.8045	0.0000
Boom	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.0323	0.0000
Total	56.770	101.321	14.171	0.114	6.083	28.524	5.567	6.047

SR-103 6. Superstructure - Span Erection

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Rough Terrain (f-lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.115	0.000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.219	0.000
Semi Truck	2.154	7.030	0.553	0.007	0.335	14.889	0.294	3.156
Flatbed	6.048	6.710	0.837	0.008	0.242	23.936	0.208	5.074
Pick Up	7.264	0.754	0.744	0.008	0.065	99.733	0.040	21.143
Concrete Truck	15.483	17.177	2.142	0.021	0.619	23.936	0.532	5.074
Concrete Pump Truck	25.378	81.616	8.310	0.085	2.973	0.000	2.735	0.000
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.609	0.000
Worker commute	9.686	1.005	0.992	0.011	0.086	0.000	0.054	0.000
Demolition	0.000	0.000	0.000	0.000	0.000	5.040	0.000	1.048
Excavation	0.000	0.000	0.000	0.000	0.000	0.504	0.000	0.105
grading	0.000	0.000	0.000	0.000	0.000	7.920	0.000	1.647
paving	0.000	0.000	0.393	0.000	0.000	0.000	0.000	0.000
Total	113.198	212.001	28.080	0.232	10.776	175.958	9.804	37.249

SR-103 6. Superstructure - Span Erection

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Rough Terrain (f-lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.1153	0.0000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.2185	0.0000
Semi Truck	2.154	7.030	0.553	0.007	0.335	8.189	0.2944	1.7360
Flatbed	6.048	6.710	0.837	0.008	0.242	13.165	0.2077	2.7909
Pick Up	7.264	0.754	0.744	0.008	0.065	54.853	0.0404	11.6289
Concrete Truck	15.483	17.177	2.142	0.021	0.619	13.165	0.5317	2.7909
Concrete Pump Truck	25.378	81.616	8.310	0.085	2.973	0.000	2.7348	0.0000
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.6090	0.0000
Worker commute	9.686	1.005	0.992	0.011	0.086	0.000	0.0538	0.0000
Demolition	0.000	0.000	0.000	0.000	0.000	1.613	0.0000	0.3355
Excavation	0.000	0.000	0.000	0.000	0.000	0.161	0.0000	0.0335
grading	0.000	0.000	0.000	0.000	0.000	2.534	0.0000	0.5272
paving	0.000	0.000	0.393	0.000	0.000	0.000	0.0000	0.0000
Total	113.198	212.001	28.080	0.232	10.776	93.680	9.804	19.843

Appendix B:

Table B6: Daily Emissions (Case-in-place) - Alternative 2 (continued)

SR-103 7. Drainage
Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
Loader	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
Haulers (Truck)	4.032	4.473	0.558	0.005	0.161	7.979	0.138	1.691
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	6.048	6.710	0.837	0.008	0.242	23.936	0.208	5.074
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Vibratory Roller	6.836	13.065	2.000	0.012	0.918	0.000	0.845	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.995	0.044	0.423
Worker commute	4.649	0.482	0.476	0.005	0.041	0.000	0.026	0.000
Demolition	0.000	0.000	0.000	0.000	0.000	0.277	0.000	0.058
Excavation	0.000	0.000	0.000	0.000	0.000	0.259	0.000	0.054
grading	0.000	0.000	0.000	0.000	0.000	2.640	0.000	0.549
Paving	0.000	0.000	0.175	0.000	0.000	0.000	0.000	0.000
Soil dumping	0.000	0.000	0.000	0.000	0.000	0.008	0.000	0.002
Total	49.819	81.442	11.893	0.092	4.614	76.987	4.197	16.308

SR-103 7. Drainage
Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	3.194	5.781	0.887	0.006	0.447	0.000	0.4114	0.0000
Loader	3.194	5.781	0.887	0.006	0.447	0.000	0.4114	0.0000
Haulers (Truck)	4.032	4.473	0.558	0.005	0.161	4.388	0.1385	0.9303
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Flatbed	6.048	6.710	0.837	0.008	0.242	13.165	0.2077	2.7909
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Vibratory Roller	6.836	13.065	2.000	0.012	0.918	0.000	0.8446	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.8045	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.097	0.0443	0.2326
Worker commute	4.649	0.482	0.476	0.005	0.041	0.000	0.0258	0.0000
Demolition	0.000	0.000	0.000	0.000	0.000	0.089	0.0000	0.0185
Excavation	0.000	0.000	0.000	0.000	0.000	0.083	0.0000	0.0172
grading	0.000	0.000	0.000	0.000	0.000	0.845	0.0000	0.1757
Paving	0.000	0.000	0.175	0.000	0.000	0.000	0.0000	0.0000
Soil dumping	0.000	0.000	0.000	0.000	0.000	0.003	0.0000	0.0005
Total	49.819	81.442	11.893	0.092	4.614	41.610	4.197	8.817

SR-103 8. Retaining Walls and Soundwalls - - MSE Walls at Ramps and Touchdowns
Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Haulers (Truck)	8.064	8.947	1.116	0.011	0.322	15.957	0.277	3.383
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.305	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	1.453	0.151	0.149	0.002	0.013	19.947	0.008	4.229
Vibratory Roller	6.836	13.065	2.000	0.012	0.918	0.000	0.845	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Concrete Truck	2.581	2.863	0.357	0.003	0.103	3.989	0.089	0.846
Worker commute	4.262	0.442	0.437	0.005	0.038	0.000	0.024	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	1.050	0.000	0.218
Grading	0.000	0.000	0.000	0.000	0.000	5.280	0.000	1.098
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.919	0.000	0.191
Total	51.003	83.857	11.861	0.094	4.815	59.110	4.382	12.502

SR-103 8. Retaining Walls and Soundwalls - - MSE Walls at Ramps and Touchdowns
Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Haulers (Truck)	8.064	8.947	1.116	0.011	0.322	8.777	0.2769	1.8606
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.3046	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	1.453	0.151	0.149	0.002	0.013	10.971	0.0081	2.3258
Vibratory Roller	6.836	13.065	2.000	0.012	0.918	0.000	0.8446	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.4022	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Concrete Truck	2.581	2.863	0.357	0.003	0.103	2.194	0.0886	0.4652
Worker commute	4.262	0.442	0.437	0.005	0.038	0.000	0.0237	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.336	0.0000	0.0699
Grading	0.000	0.000	0.000	0.000	0.000	1.690	0.0000	0.3514
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.294	0.0000	0.0612
Total	51.003	83.857	11.861	0.094	4.815	30.843	4.382	6.530

Appendix B:

Table B6: Daily Emissions (Case-in-place) - Alternative 2 (continued)

SR-103 9. Striping, Lighting and Signing
Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Boom	13.732	34.599	3.617	0.041	1.507	0.000	1.386	0.000
Loader	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
Generator	8.108	16.124	2.448	0.017	0.993	0.000	0.914	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	4.359	0.452	0.447	0.005	0.039	59.840	0.024	12.686
Compressor	8.878	18.393	2.831	0.017	1.312	0.000	1.207	0.000
Striper (Truck)	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.000	0.030	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.412	0.000	0.086
Total	53.064	99.671	13.281	0.117	5.210	72.220	4.760	15.309

SR-103 9. Striping, Lighting and Signing
Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Boom	13.732	34.599	3.617	0.041	1.507	0.000	1.3863	0.0000
Loader	3.194	5.781	0.887	0.006	0.447	0.000	0.4114	0.0000
Generator	8.108	16.124	2.448	0.017	0.993	0.000	0.9139	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	4.359	0.452	0.447	0.005	0.039	32.912	0.0242	6.9773
Compressor	8.878	18.393	2.831	0.017	1.312	0.000	1.2067	0.0000
Striper (Truck)	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.000	0.0302	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.132	0.0000	0.0274
Total	53.064	99.671	13.281	0.117	5.210	39.626	4.760	8.400

SHB and SR-103: Stockpile Area
Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Stock piles	0.000	0.000	0.000	0.000	0.000	79.8	0.0	16.6

SHB and SR-103: Stockpile Area
Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

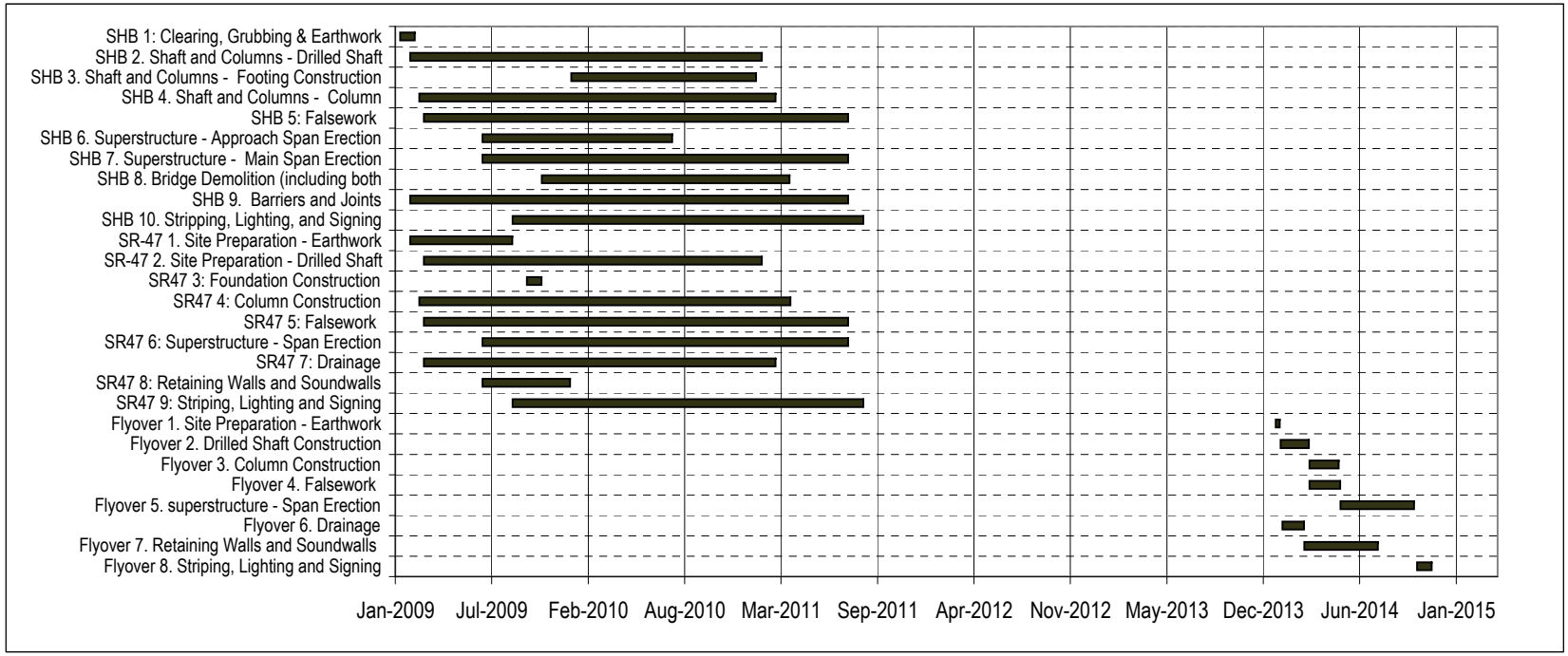
	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Stock piles	0.000	0.000	0.000	0.000	0.000	25.541	0.0000	5.3125

Note: Stock pile areas were not specified or calculated for each construction phases. The maximum areas that might be covered each day by the whole project was used to calculate the total fugitive dust emissions from stock piles.

Appendix C
Construction Emission Calculations – Alternative 3, CIP Method

Appendix C:

Table C1: Construction Schedule (Case-in-place) - Alternative 3



Source: DMJM Harris, May 2005, January 2007

Appendix C:

Table C2: Maximum Construction Emissions: By Source (Case-in-place) - Alternative 3

Maximum Daily Construction Emissions

		CO (lb/day)	NOx (lb/day)	ROG (lb/day)	SOx (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
With Watering to Control Fugitive Dust	Maximum Construction Equipment Exhaust	814	1745	203	1.8	83	76
	Maximum Workers Commute	75	7.8	7.7	0.08	0.67	0.42
	Maximum Fugitive Dust	NA	NA	NA	NA	893	189
	Maximum Combined Daily Emissions	**889**	**1753**	**211**	**1.9**	**976**	**265**
SCAQMD Thresholds		550	100	75	150	150	55
Exceeding Thresholds?		YES	YES	YES	NO	YES	YES

Note: The maximum daily emissions from equipment exhaust, fugitive dust, and workers commute are not additive because these worst case emissions do not always occur on the same day.

Appendix C:
Table C3. Summary of Daily Emissions (Case-in-place) - Alternative 3

		Total Emissions without Watering (lb/day)									
Construction Phases		**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**PM_{10} Fugitive**	**PM_{10} Total**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ Fugitive**	**$PM_{2.5}$ Total**
1	SHB 1: Clearing, Grubbing & Earthwork	7.34	8.24	1.38	0.01	0.55	8.98	9.52	0.49	1.90	2.40
2	SHB 2. Shaft and Columns - Drilled Shaft Construction	52.15	103.36	12.52	0.12	4.56	63.74	68.29	4.15	13.50	17.65
3	SHB 3. Shaft and Columns - Footing Construction	47.63	88.08	10.81	0.10	3.89	57.06	60.95	3.51	12.09	15.61
4	SHB 4. Shaft and Columns - Column Construction	26.76	51.26	6.44	0.06	2.33	32.91	35.24	2.12	6.98	9.10
5	SHB 5: Falsework	117.31	322.90	25.10	0.27	12.85	424.08	436.93	11.77	89.90	101.68
6	SHB 6. Superstructure - Approach Span Erection	89.37	157.67	21.01	0.17	8.12	177.12	185.25	7.37	37.52	44.90
7	SHB 7. Superstructure - Main Span Erection	85.67	157.46	19.97	0.17	7.61	165.97	173.59	6.90	35.18	42.09
8	SHB 8. Bridge Demolition (including both approaches)	81.77	116.66	17.95	0.13	7.34	127.35	134.69	6.67	26.98	33.65
9	SHB 9. Barriers and Joints	7.51	5.89	0.97	0.01	0.25	17.68	17.94	0.21	3.75	3.96
10	SHB 10. Stripping, Lighting, and Signing	36.19	91.97	10.22	0.10	3.64	47.59	51.22	3.32	10.09	13.41
11	SR-47 1. Site Preparation - Earthwork	71.53	123.95	17.76	0.14	7.35	67.82	75.17	6.71	14.38	21.09
12	SR-47 2. Site Preparation - Drilled Shaft Construction	52.15	103.36	12.52	0.12	4.56	64.77	69.32	4.15	13.72	17.87
13	SR47 3: Foundation Construction	64.44	137.71	16.73	0.15	6.43	59.90	66.33	5.88	12.70	18.57
14	SR47 4: Column Construction	27.79	50.95	6.53	0.06	2.33	55.85	58.18	2.11	11.84	13.95
15	SR47 5: Falsework	56.77	101.32	14.17	0.11	6.08	51.86	57.94	5.57	10.99	16.56
16	SR47 6: Superstructure - Span Erection	113.20	212.00	28.08	0.23	10.78	175.96	186.73	9.80	37.25	47.05
17	SR47 7: Drainage	49.82	81.44	11.89	0.09	4.61	76.99	81.60	4.20	16.31	20.51
18	SR47 8: Retaining Walls and Soundwalls	55.37	93.93	13.44	0.10	5.53	57.12	62.65	5.04	12.08	17.12
19	SR47 9: Striping, Lighting and Signing	44.49	81.46	11.20	0.09	4.34	52.27	56.61	3.96	11.08	15.04
20	Flyover 1. Site Preparation - Earthwork	11.34	18.12	2.59	0.03	0.80	9.97	10.77	0.72	2.11	2.84
21	Flyover 2. Drilled Shaft Construction	43.65	72.98	9.52	0.13	3.19	29.96	33.16	2.89	6.35	9.24
22	Flyover 3. Column Construction	27.39	45.09	6.25	0.07	2.21	21.94	24.15	2.00	4.65	6.65
23	Flyover 4. Falsework	59.33	102.79	14.11	0.15	5.63	15.96	21.58	5.16	3.38	8.54
24	Flyover 5. superstructure - Span Erection	72.36	117.94	16.14	0.18	6.28	57.51	63.79	5.69	12.19	17.88
25	Flyover 6. Drainage	25.44	41.89	5.95	0.06	2.30	7.38	9.67	2.10	1.56	3.65
26	Flyover 7. Retaining Walls and Soundwalls	62.50	84.94	12.27	0.14	4.72	35.60	40.33	4.26	7.52	11.77
27	Flyover 8. Striping, Lighting and Signing	15.50	26.74	3.74	0.04	1.34	0.11	1.46	1.23	0.02	1.25
	SHB SR47 Stock Piles (entire project)	0.00	0.00	0.00	0.00	0.00	79.82	79.82	0.00	16.60	16.60
	Overlapping phases										
	2,4,5,9,11,12,14,15,17	462	944	108	1.0	45	936	980	41	198	239
	2,4,5,6,7,9,11,12,14,15,16,17,18	805	1565	190	1.7	77	1512	1589	70	320	390
	2,4,5,6,7,9,10,12,13,14,15,16,17,18,19	879	1753	211	1.9	84	1604	1688	77	339	416
	2,3,4,5,6,7,8,9,10,12,14,15,16,17,19	889	1726	209	1.8	83	1671	1754	76	354	430
	2,3,4,5,7,8,9,10,12,14,15,16,17,19	799	1568	188	1.7	75	1494	1569	68	316	385
	20	11	18	2.6	0.03	0.8	90	91	0.7	18.7	19.4
	21,25	69	115	15	0.19	5.5	117	123	5.0	24.5	29.5
	22,23,26	149	233	33	0.37	12.6	153	166	11.4	32.2	43.6
	27	16	27	3.7	0.04	1.3	80	81	1.2	16.6	17.9
	Max. Daily Emissions	**889**	**1753**	**211**	**1.9**	**84**	**1671**	**1754**	**77**	**354**	**430**

Note:
1. Based on the construction schedule, emissions from overlapping construction phases were added together to evaluate the worst case scenarios. The maximum daily emissions represent the scenario of overlapping phases with the highest emissions.
2. Fugitive dust emissions from stock piles were not calculated for each construction phase. The emissions were calculated separately based on a maximum area that the stock piles will cover during the entire construction duration.
3. The fugitive dusts were assumed to be controlled by 68% by watering the site 3 times per day, and 45% by watering the unpaved roads 3 times a day, according to the control efficiencies in SCAQMD CEQA Air Quality Handbook Table 11-4.

Appendix C:
Table C3. Summary of Daily Emissions (Case-in-place) -

		Total Emissions with Watering (lb/day)									
	Construction Phases	**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**PM_{10} Fugitive**	**PM_{10} Total**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ Fugitive**	**$PM_{2.5}$ Total**
1	SHB 1: Clearing, Grubbing & Earthwork	7.34	8.24	1.38	0.01	0.55	4.94	5.48	0.49	1.05	1.54
2	SHB 2. Shaft and Columns - Drilled Shaft Construction	52.15	103.36	12.52	0.12	4.56	34.62	39.17	4.15	7.34	11.48
3	SHB 3. Shaft and Columns - Footing Construction	47.63	88.08	10.81	0.10	3.89	31.11	34.99	3.51	6.59	10.11
4	SHB 4. Shaft and Columns - Column Construction	26.76	51.26	6.44	0.06	2.33	18.10	20.43	2.12	3.84	5.96
5	SHB 5: Falsework	117.31	322.90	25.10	0.27	12.85	233.24	246.09	11.77	49.45	61.22
6	SHB 6. Superstructure - Approach Span Erection	89.37	157.67	21.01	0.17	8.12	95.89	104.01	7.37	20.32	27.69
7	SHB 7. Superstructure - Main Span Erection	85.67	157.46	19.97	0.17	7.61	90.94	98.56	6.90	19.28	26.18
8	SHB 8. Bridge Demolition (including both approaches)	81.77	116.66	17.95	0.13	7.34	69.20	76.54	6.67	14.66	21.33
9	SHB 9. Barriers and Joints	7.51	5.89	0.97	0.01	0.25	9.73	9.98	0.21	2.06	2.27
10	SHB 10. Stripping, Lighting, and Signing	36.19	91.97	10.22	0.10	3.64	26.11	29.75	3.32	5.54	8.86
11	SR-47 1. Site Preparation - Earthwork	71.53	123.95	17.76	0.14	7.35	37.30	44.65	6.71	7.91	14.62
12	SR-47 2. Site Preparation - Drilled Shaft Construction	52.15	103.36	12.52	0.12	4.56	34.95	39.50	4.15	7.41	11.55
13	SR47 3: Foundation Construction	64.44	137.71	16.73	0.15	6.43	32.93	39.36	5.88	6.98	12.86
14	SR47 4: Column Construction	27.79	50.95	6.53	0.06	2.33	30.72	33.05	2.11	6.51	8.63
15	SR47 5: Falsework	56.77	101.32	14.17	0.11	6.08	28.52	34.61	5.57	6.05	11.61
16	SR47 6: Superstructure - Span Erection	113.20	212.00	28.08	0.23	10.78	93.68	104.46	9.80	19.84	29.65
17	SR47 7: Drainage	49.82	81.44	11.89	0.09	4.61	41.61	46.22	4.20	8.82	13.01
18	SR47 8: Retaining Walls and Soundwalls	55.37	93.93	13.44	0.10	5.53	29.75	35.28	5.04	6.30	11.34
19	SR47 9: Striping, Lighting and Signing	44.49	81.46	11.20	0.09	4.34	28.66	32.99	3.96	6.07	10.04
20	Flyover 1. Site Preparation - Earthwork	11.34	18.12	2.59	0.03	0.80	5.49	6.28	0.72	1.16	1.88
21	Flyover 2. Drilled Shaft Construction	43.65	72.98	9.52	0.13	3.19	16.24	19.43	2.89	3.44	6.33
22	Flyover 3. Column Construction	27.39	45.09	6.25	0.07	2.21	12.07	14.27	2.00	2.56	4.55
23	Flyover 4. Falsework	59.33	102.79	14.11	0.15	5.63	8.78	14.40	5.16	1.86	7.02
24	Flyover 5. superstructure - Span Erection	72.36	117.94	16.14	0.18	6.28	31.63	37.91	5.69	6.71	12.40
25	Flyover 6. Drainage	25.44	41.89	5.95	0.06	2.30	3.59	5.88	2.10	0.76	2.85
26	Flyover 7. Retaining Walls and Soundwalls	62.50	84.94	12.27	0.14	4.72	17.70	22.43	4.26	3.74	8.00
27	Flyover 8. Striping, Lighting and Signing	15.50	26.74	3.74	0.04	1.34	0.04	1.38	1.23	0.01	1.23
	SHB SR47 Stock Piles (entire project)	0.00	0.00	0.00	0.00	0.00	25.54	25.54	0.00	5.31	5.31
	Overlapping phases										
	2,4,5,9,11,12,14,15,17	462	944	108	1.0	45	494	539	41	105	146
	2,4,5,6,7,9,11,12,14,15,16,17,18	805	1565	190	1.7	77	805	882	70	170	241
	2,4,5,6,7,9,10,12,13,14,15,16,17,18,19	879	1753	211	1.9	84	855	939	77	181	258
	2,3,4,5,6,7,8,9,10,12,14,15,16,17,19	889	1726	209	1.8	83	893	976	76	189	265
	2,3,4,5,7,8,9,10,12,14,15,16,17,19	799	1568	188	1.7	75	797	872	68	169	237
	20	11	18	2.59	0.03	0.80	31	32	0.7	6.5	7.2
	21,25	69	115	15.47	0.19	5.49	45	51	5.0	9.5	14.5
	22,23,26	149	233	32.63	0.37	12.56	64	77	11.4	13.5	24.9
	27	16	27	3.74	0.04	1.34	26	27	1.2	5.3	6.5
	Max. Daily Emissions	**889**	**1753**	**211**	**1.9**	**84**	**893**	**976**	**77**	**189**	**265**

Appendix C:
Table C3. Summary of Daily Emissions (Case-in-place) -

		Construction Equipment Exhaust (lb/day)						Workers Commute (lb/day)					
	Construction Phases	**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**$PM_{2.5}$ Exhaust**	**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**$PM_{2.5}$ Exhaust**
1	SHB 1: Clearing, Grubbing & Earthwork	5.79	8.08	1.23	0.01	0.53	0.48	1.550	0.161	0.159	0.002	0.014	0.009
2	SHB 2. Shaft and Columns - Drilled Shaft Construction	46.72	102.80	11.96	0.11	4.51	4.12	5.424	0.563	0.556	0.006	0.048	0.030
3	SHB 3. Shaft and Columns - Footing Construction	45.31	87.82	10.56	0.10	3.86	3.50	2.314	0.257	0.256	0.003	0.024	0.015
4	SHB 4. Shaft and Columns - Column Construction	24.05	50.98	6.17	0.05	2.31	2.10	2.712	0.281	0.278	0.003	0.024	0.015
5	SHB 5: Falsework	111.50	322.30	24.50	0.27	12.80	11.74	5.811	0.603	0.595	0.006	0.052	0.032
6	SHB 6. Superstructure - Approach Span Erection	83.56	157.07	20.41	0.17	8.07	7.34	5.811	0.603	0.595	0.006	0.052	0.032
7	SHB 7. Superstructure - Main Span Erection	79.86	156.85	19.38	0.16	7.56	6.87	5.811	0.603	0.595	0.006	0.052	0.032
8	SHB 8. Bridge Demolition (including both approaches)	75.58	116.02	17.32	0.13	7.29	6.63	6.199	0.643	0.635	0.007	0.055	0.034
9	SHB 9. Barriers and Joints	4.41	5.57	0.66	0.01	0.22	0.19	3.099	0.322	0.318	0.003	0.028	0.017
10	SHB 10. Stripping, Lighting, and Signing	32.32	91.56	9.83	0.10	3.60	3.30	3.874	0.402	0.397	0.004	0.034	0.022
11	SR-47 1. Site Preparation - Earthwork	65.72	123.34	17.16	0.13	7.30	6.68	5.811	0.603	0.595	0.006	0.052	0.032
12	SR-47 2. Site Preparation - Drilled Shaft Construction	46.72	102.80	11.96	0.11	4.51	4.12	5.424	0.563	0.556	0.006	0.048	0.030
13	SR47 3: Foundation Construction	61.73	137.43	16.45	0.15	6.41	5.86	2.712	0.281	0.278	0.003	0.024	0.015
14	SR47 4: Column Construction	25.08	50.66	6.26	0.05	2.30	2.10	2.712	0.281	0.278	0.003	0.024	0.015
15	SR47 5: Falsework	50.96	100.72	13.58	0.11	6.03	5.53	5.811	0.603	0.595	0.006	0.052	0.032
16	SR47 6: Superstructure - Span Erection	103.51	211.00	27.09	0.22	10.69	9.75	9.686	1.005	0.992	0.011	0.086	0.054
17	SR47 7: Drainage	45.17	80.96	11.42	0.09	4.57	4.17	4.649	0.482	0.476	0.005	0.041	0.026
18	SR47 8: Retaining Walls and Soundwalls	51.11	93.49	13.01	0.10	5.49	5.02	4.262	0.442	0.437	0.005	0.038	0.024
19	SR47 9: Striping, Lighting and Signing	39.06	80.90	10.64	0.09	4.29	3.93	5.424	0.563	0.556	0.006	0.048	0.030
20	Flyover 1. Site Preparation - Earthwork	9.75	17.96	2.43	0.03	0.78	0.71	1.585	0.157	0.169	0.003	0.022	0.0142528
21	Flyover 2. Drilled Shaft Construction	41.01	72.72	9.24	0.12	3.16	2.87	2.641	0.262	0.281	0.004	0.037	0.0237546
22	Flyover 3. Column Construction	24.75	44.83	5.97	0.07	2.17	1.97	2.641	0.262	0.281	0.004	0.037	0.0237546
23	Flyover 4. Falsework	56.69	102.53	13.83	0.15	5.59	5.13	2.641	0.262	0.281	0.004	0.037	0.0237546
24	Flyover 5. superstructure - Span Erection	69.19	117.62	15.80	0.18	6.24	5.66	3.170	0.314	0.337	0.005	0.044	0.0285055
25	Flyover 6. Drainage	24.12	41.76	5.81	0.06	2.28	2.08	1.321	0.131	0.140	0.002	0.018	0.0118773
26	Flyover 7. Retaining Walls and Soundwalls	59.33	84.62	11.93	0.14	4.68	4.23	3.170	0.314	0.337	0.005	0.044	0.0285055
27	Flyover 8. Striping, Lighting and Signing	13.92	26.58	3.58	0.04	1.32	1.21	1.585	0.157	0.169	0.003	0.022	0.0142528
	SHB SR47 Stock Piles (entire project)	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000
	Overlapping phases												
	2,4,5,9,11,12,14,15,17	420	940	104	0.9	45	41	41	4.30	4.25	0.05	0.37	0.23
	2,4,5,6,7,9,11,12,14,15,16,17,18	738	1559	184	1.6	76	70	67	6.96	6.87	0.07	0.60	0.37
	2,4,5,6,7,9,10,12,13,14,15,16,17,18,19	806	1745	203	1.8	83	76	73	7.60	7.50	0.08	0.65	0.41
	2,3,4,5,6,7,8,9,10,12,14,15,16,17,19	814	1718	202	1.8	83	75	75	7.78	7.68	0.08	0.67	0.42
	2,3,4,5,7,8,9,10,12,14,15,16,17,19	730	1561	181	1.6	75	68	69	7.17	7.08	0.08	0.62	0.39
	20	10	18	2.4	0.03	0.78	0.71	1.6	0.16	0.17	0.003	0.02	0.01
	21,25	65	114	15	0.19	5.44	4.95	4.0	0.39	0.42	0.006	0.06	0.04
	22,23,26	141	232	32	0.35	12.44	11.33	8.5	0.84	0.90	0.014	0.12	0.08
	27	14	27	3.6	0.04	1.32	1.21	1.6	0.16	0.17	0.003	0.02	0.01
	Max. Daily Emissions	**814**	**1745**	**203**	**1.8**	**83**	**76**	**75**	**7.8**	**7.7**	**0.08**	**0.7**	**0.4**

Appendix C:

Table C4: Construction Equipment Usage (Case-in-place) - Alternative 3

Schuyler Heim Bridge (SHB)

SHB 1: Clearing, Grubbing & Earthwork

Construction duration from 1/11/2009 to 2/11/2009 This work will occur in stages as work areas become available.

Number of construction Workers 4 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe/excavator	NA	1	1	20	8	160	8	NA	NA	NA	NA
Pick Up	NA	1	1	20	4	80	NA	60	1	5	55
Haul Truck	NA	1	1	20	4	80	NA	50	2	4	46
Worker commute	NA	4	NA	NA	NA	NA	NA	40	1	0	40

SHB 2. Shaft and Columns - Drilled Shaft Construction

Construction duration from 2/1/2009 to 2/1/2011

Number of construction Workers 14 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**CIDH**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per CIDH**	**per CIDH**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
200 ton crane	NA	1	87	10	80	6960	8	NA	NA	NA	NA
Caisson Drill	NA	1	87	4	32	2784	8	NA	NA	NA	NA
140 ton crane	NA	1	87	7	56	4872	8	NA	NA	NA	NA
Generator	NA	2	87	10	80	13920	8	NA	NA	NA	NA
Flatbed	NA	2	87	10	80	13920	NA	50	1.5	6	44
Pick Up	NA	4	87	10	80	27840	NA	50	1.5	10	40
Concrete Truck	NA	5	87	2	16	6960	NA	32	2	2	30
Concrete Pump Truck	NA	1	87	2	16	1392	8	NA	NA	NA	NA
Compressor	NA	1	87	1	8	696	8	NA	NA	NA	NA
Water Truck	NA	1	87	4	32	2784	8	NA	NA	NA	NA
Worker commute	NA	14	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	3848	40	ft^3	290
Soil loading	333	47.5	yd^3	7.0

Appendix C:

Table C4: Construction Equipment Usage (Case-in-place) - Alternative 3 (continued)

SHB 3. Shaft and Columns - Footing Construction

Construction duration from 1/1/2010 to 1/20/2011

Number of construction Workers 7 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Embank. Wall**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per Wall**	**per Wall**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe/excavator	NA	1	2	5	40	80	8	NA	NA	NA	NA
140 ton crane	NA	1	2	2	16	32	8	NA	NA	NA	NA
Generator	NA	1	2	10	80	160	8	NA	NA	NA	NA
Haul Truck	NA	4	2	5	40	320	NA	50	2	4	46
Pick Up	NA	2	2	10	80	320	NA	50	1.5	10	40
Concrete Truck	NA	10	2	2	16	320	NA	32	2	2	30
Concrete Pump Truck	NA	1	2	2	16	32	8	NA	NA	NA	NA
Compressor	NA	1	2	10	80	160	8	NA	NA	NA	NA
Water Truck	NA	1	2	4	32	64	8	NA	NA	NA	NA
Worker commute	NA	7	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	2400	86	ft^3	28
Soil loading	207	30	yd^3	7

SHB 4. Shaft and Columns - Column Construction

Construction duration from 2/20/2009 to 3/1/2011

Number of construction Workers 7 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Columns**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per Col.**	**per Col.**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
140 ton crane	NA	1	87	1	8	696	8	NA	NA	NA	NA
Generator	NA	1	87	4	32	2784	8	NA	NA	NA	NA
Flatbed	NA	1	87	2.5	20	1740	NA	50	1.5	6	44
Pick Up	NA	2	87	4	32	5568	NA	50	1.5	10	40
Concrete Truck	NA	3.5	87	1	8	2436	NA	32	2	2	30
Concrete Pump Truck	NA	1	87	1	8	696	8	NA	NA	NA	NA
Compressor	NA	1	87	4	32	2784	8	NA	NA	NA	NA
Worker commute		7	NA	NA	NA	NA	NA	40	1	0	40

Appendix C:

Table C4: Construction Equipment Usage (Case-in-place) - Alternative 3 (continued)

SHB 5: Falsework

Construction duration from 3/1/2009 to 7/30/2011

Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
140 ton crane	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
Generator	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
Flatbed	NA	2	20	400	3200	6400	NA	50	1.5	6	44
Pick Up	NA	4	20	400	3200	12800	NA	50	1.5	10	40
Rough Terrain (f - lift)	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
Scissor Lift	NA	2	15	300	2400	4800	8	NA	NA	NA	NA
Compressor	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
Boom	NA	2	15	300	2400	4800	8	NA	NA	NA	NA
Semi Truck	NA	10	0.5	10	20	200	NA	20	1	20	0
Loader	NA	2	1	20	160	320	8	NA	NA	NA	NA
Tug boat	NA	1	1.5	30	240	240	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

SHB 6. Superstructure - Approach Span Erection

Construction duration from 7/1/2009 to 7/30/2010

Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
275 ton crane	NA	1	18	360	2880	2880	8	NA	NA	NA	NA
Rough Terrain (f-lift)	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
140 ton crane	NA	1	20	400	3200	3200	8	NA	NA	NA	NA
Generator	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
Semi Truck	NA	4	10	200	1600	6400	NA	42	1	2	40
Flatbed	NA	6	12	240	1920	11520	NA	50	1.5	6	44
Pick Up	NA	10	20	400	3200	32000	NA	50	1.5	10	40
Concrete Truck	NA	10	10	200	1600	16000	NA	32	2	2	30
Concrete Pump Truck	NA	2	10	200	1600	3200	8	NA	NA	NA	NA
Compressor	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	127340	2122	ft^3	60
Grading	2	0.1	acre	20
Soil loading	1572	79	yd^3	20

Appendix C:

Table C4: Construction Equipment Usage (Case-in-place) - Alternative 3 (continued)

SHB 7. Superstructure - Main Span Erection

Construction duration from 7/1/2009 to 7/30/2011

Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
275 ton crane	NA	2	8	160	1280	2560	8	NA	NA	NA	NA
Rough Terrain (f-lift)	NA	2	10	200	1600	3200	8	NA	NA	NA	NA
140 ton crane	NA	2	10	200	1600	3200	8	NA	NA	NA	NA
Generator	NA	2	18	360	2880	5760	8	NA	NA	NA	NA
Semi Truck	NA	4	10	200	1600	6400	NA	42	1	2	40
Flatbed	NA	5	18	360	2880	14400	NA	50	1.5	6	44
Pick Up	NA	10	18	360	2880	28800	NA	50	1.5	10	40
Concrete Truck	NA	10	10	200	1600	16000	NA	32	2	2	30
Concrete Pump Truck	NA	2	10	200	1600	3200	8	NA	NA	NA	NA
Compressor	NA	2	18	360	2880	5760	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	11550	192.5	ft^3	60
Grading	1.5	0.1	acre	30
Soil loading	42.8	2	yd^3	20

SHB 8. Bridge Demolition (including both approaches)

Construction duration from 11/1/2009 to 3/30/2011

Number of construction Workers 16 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Pick Up	NA	6	4.5	90	3	1620	NA	50	1.5	10	40
Haul Truck	NA	10	4.5	90	4	3600	NA	50	2	4	46
Compressor	NA	4	4.5	90	8	2880	8	NA	NA	NA	NA
Generator	NA	4	4.5	90	6	2160	8	NA	NA	NA	NA
Flatbed	NA	4	4.5	90	3	1080	NA	50	1.5	6	44
Backhoe/excavator	NA	4	4.5	90	8	2880	8	NA	NA	NA	NA
Loader	NA	3	4.5	90	4	1080	8	NA	NA	NA	NA
Worker commute	NA	16	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Demolition	62500	391	ft^3	160
Excavation	40300	672	ft^4	60
Grading	2	0.1	acre	20
Soil loading	299	15	yd^3	20

Appendix C:

Table C4: Construction Equipment Usage (Case-in-place) - Alternative 3 (continued)

SHB 9. Barriers and Joints

Construction duration from 2/1/2009 to 7/30/2011

Number of construction Workers 8 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Pick Up	NA	1	6	120	480	480	NA	50	1	6	44
Concrete Trucks	NA	2	6	120	960	1920	NA	32	2	2	30
Flatbed Truck	NA	1	6	120	480	480	NA	40	1	4	36
Semi Truck	NA	1	6	120	480	480	NA	42	1	2	40
Worker commute	NA	8	NA	NA	NA	NA	NA	40	1	0	40

SHB 10. Stripping, Lighting, and Signing

Construction duration from 9/1/2009 to 8/30/2011

Number of construction Workers 10 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Pick Up	NA	4	2	40	3	480	NA	50	1.5	10	40
Paint truck	NA	1	1.5	30	7	210	8	NA	NA	NA	NA
Compressor	NA	1	1.5	30	7	210	8	NA	NA	NA	NA
Bucket Truck	NA	2	2	40	5	400	8	NA	NA	NA	NA
Semi Truck	NA	2	0.5	10	4	80	NA	42	1	2	40
Boom Truck	NA	1	0.5	10	6	60	8	NA	NA	NA	NA
Worker commute	NA	10	NA	NA	NA	NA	NA	40	1	0	40
	Total Amount	**Daily Amount**	**Unit**	**duration**							
excavation	11781	589	ft^3	20							

Appendix C:

Table C4: Construction Equipment Usage (Case-in-place) - Alternative 3 (continued)
SR-47 Truck Expressway

SR-47 1. Site Preparation - Earthwork

Construction duration from 2/1/2009 to 9/1/2009
Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	HP rating	Units	Project	work	hours	total time	Maximum daily hours	Miles per round trip	Daily roundtrips	Miles on unpaved road	Miles on paved road
		(Ea.)	Time (mo)	days	(hrs)	(hrs)	(hrs/day)	Miles/RT	RT/day	miles/day	miles/day
Backhoe	NA	2	4	80	640	1280	8	NA	NA	NA	NA
Loader	NA	2	4	80	640	1280	8	NA	NA	NA	NA
Haulers (Truck)	NA	4	2	40	320	1280	NA	50	2	4	46
Generator	NA	2	4	80	640	1280	8	NA	NA	NA	NA
Flatbed	NA	2	4	80	640	1280	NA	50	1.5	6	44
Pick Up	NA	4	4	80	640	2560	NA	50	1.5	10	40
Grader	NA	2	1	20	160	320	8	NA	NA	NA	NA
Vibratory loader	NA	2	1	20	160	320	8	NA	NA	NA	NA
Asphalt Paver	NA	1	1	20	160	160	8	NA	NA	NA	NA
Compressor	NA	2	4	80	640	1280	8	NA	NA	NA	NA
Water Truck	NA	1	4	80	640	640	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

SR-47 2. Site Preparation - Drilled Shaft Construction

Construction duration from 3/1/2009 to 2/1/2011
Number of construction Workers 14 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	HP rating	Units	CIDH	work days	hours	total time	Maximum daily hours	Miles per round trip	Daily roundtrips	Miles on unpaved road	Miles on paved road
		(Ea.)	(Ea.)	per CIDH	per CIDH	(hrs)	(hrs/day)	Miles/RT	RT/day	miles/day	miles/day
200 ton crane	NA	1	120	10	80	9600	8	NA	NA	NA	NA
Caisson Drill	NA	1	120	4	32	3840	8	NA	NA	NA	NA
140 ton crane	NA	1	120	7	56	6720	8	NA	NA	NA	NA
Generator	NA	2	120	10	80	19200	8	NA	NA	NA	NA
Flatbed	NA	2	120	10	80	19200	NA	50	1.5	6	44
Pick Up	NA	4	120	10	80	38400	NA	50	1.5	10	40
Concrete Truck	NA	5	120	2	16	9600	NA	32	2	2	30
Concrete Pump Truck	NA	1	120	2	16	1920	8	NA	NA	NA	NA
Compressor	NA	1	120	1	8	960	8	NA	NA	NA	NA
Water Truck	NA	1	120	4	32	3840	8	NA	NA	NA	NA
Worker commute	NA	14	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	Daily Amount	Unit	duration
Demolition	13572	226	ft^3	60
Excavation	16286	271	ft^3	60
Grading	2	0.1	acre	20
Soil Loading	42	2	yd^3	20

Appendix C:

Table C4: Construction Equipment Usage (Case-in-place) - Alternative 3 (continued)

SR47 3: Foundation Construction

Construction duration from 10/1/2009 to 11/1/2009
Number of construction Workers 7 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe/excavator	NA	2	1	20	160	320	8	NA	NA	NA	NA
140 ton crane	NA	1	1	20	160	160	8	NA	NA	NA	NA
Generator	NA	2	1	20	160	320	8	NA	NA	NA	NA
Haul Truck	NA	4	1	20	160	640	NA	50	2	4	46
Pick Up	NA	4	1	20	160	640	NA	50	1.5	10	40
Concrete Truck	NA	2	0.25	5	40	20	NA	32	2	2	30
Concrete Pump Truck	NA	2	0.25	5	40	20	8	NA	NA	NA	NA
Compressor	NA	2	1	20	160	320	8	NA	NA	NA	NA
Water Truck	NA	1	1	20	160	160	8	NA	NA	NA	NA
Pile Driver	NA	2	1	20	160	320	8	NA	NA	NA	NA
Worker commute	NA	7	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	408	81.6	ft^3	5
Soil Loading	3.0	0.6	yd^3	5

SR47 5: Falsework

Construction duration from 2/20/2009 to 4/1/2011
Number of construction Workers 7 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Columns**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per Col.**	**per Col.**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
140 ton crane	NA	1	120	1	8	960	8	NA	NA	NA	NA
Generator	NA	1	120	4	32	3840	8	NA	NA	NA	NA
Flatbed	NA	2	120	2	16	3840	NA	50	1.5	6	44
Pick Up	NA	4	120	4	32	15360	NA	50	1.5	10	40
Concrete Truck	NA	2	120	1	8	1920	NA	32	2	2	30
Concrete Pump Truck	NA	1	120	1	8	960	8	NA	NA	NA	NA
Compressor	NA	1	120	4	32	3840	8	NA	NA	NA	NA
Worker commute	NA	7	NA	NA	NA	NA	NA	40	1	0	40

Appendix C:

Table C4: Construction Equipment Usage (Case-in-place) - Alternative 3 (continued)

SR47 5: Falsework

Construction duration from 3/1/2009 to 7/30/2011
Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
100 ton crane	NA	1	30	600	4800	4800	8	NA	NA	NA	NA
Generator	NA	2	30	600	4800	9600	8	NA	NA	NA	NA
Flatbed	NA	2	30	600	4800	9600	NA	50	1.5	6	44
Pick Up	NA	4	30	600	4800	19200	NA	50	1.5	10	40
Rough Terrain (f - lift)	NA	4	30	600	4800	19200	8	NA	NA	NA	NA
Scissor Lift	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
Compressor	NA	2	30	600	4800	9600	8	NA	NA	NA	NA
Boom	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

SR47 6: Superstructure - Span Erection

Construction duration from 7/1/2009 to 7/30/2011
Number of construction Workers 25 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
275 ton crane	NA	1	18	360	2880	2880	8	NA	NA	NA	NA
Rough Terrain (f-lift)	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
140 ton crane	NA	1	20	400	3200	3200	8	NA	NA	NA	NA
Generator	NA	4	18	360	2880	11520	8	NA	NA	NA	NA
Semi Truck	NA	4	16	320	2560	10240	NA	42	1	2	40
Flatbed	NA	4	20	400	3200	12800	NA	50	1.5	6	44
Pick Up	NA	10	20	400	3200	32000	NA	50	1.5	10	40
Concrete Truck	NA	12	9	180	1440	17280	NA	32	2	2	30
Concrete Pump Truck	NA	4	9	180	1440	5760	8	NA	NA	NA	NA
Compressor	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
Worker commute	NA	25	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Demolition	120000	12000	ft^3	10
Excavation	12000	1200	ft^3	10
grading	1.5	0.3	acre	5
paving	1.5	0.15	acre	10

Appendix C:

Table C4: Construction Equipment Usage (Case-in-place) - Alternative 3 (continued)

SR47 7: Drainage

Construction duration from 3/1/2009 to 3/1/2011

Number of construction Workers 12 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe	NA	1	2	40	320	320	8	NA	NA	NA	NA
Loader	NA	1	2	40	320	320	8	NA	NA	NA	NA
Haulers (Truck)	NA	2	0.5	10	80	160	NA	50	2	4	46
Generator	NA	2	2	40	320	640	8	NA	NA	NA	NA
Flatbed	NA	4	2	40	320	1280	NA	50	1.5	6	44
Pick Up	NA	4	2	40	320	1280	NA	50	1.5	10	40
Vibratory Roller	NA	2	1	20	160	320	8	NA	NA	NA	NA
Compressor	NA	2	2	40	320	640	8	NA	NA	NA	NA
Water Truck	NA	1	1	20	160	160	8	NA	NA	NA	NA
Concrete Truck	NA	1	0.25	5	40	40	NA	32	2	2	30
Worker commute	NA	12	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Demolition	105600	660	ft^3	160
Excavation	73920	616	ft^4	120
grading	2	0.10	acre	20
Paving	2	0.07	acre	30
Soil dumping	10	0.5	yd^3	60

SR47 8: Retaining Walls and Soundwalls

Construction duration from 7/1/2009 to 12/30/2009

Number of construction Workers 11 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe	NA	2	3	60	480	960	8	NA	NA	NA	NA
Loader	NA	2	3	60	480	960	8	NA	NA	NA	NA
Haulers (Truck)	NA	4	2	40	320	1280	NA	50	2	4	46
Generator	NA	2	3	60	480	960	8	NA	NA	NA	NA
Flatbed	NA	2	2	40	320	640	NA	50	1.5	6	44
Pick Up	NA	2	3	60	480	960	NA	50	1.5	10	40
Vibratory Roller	NA	2	2	40	320	640	8	NA	NA	NA	NA
Compressor	NA	2	3	60	480	960	8	NA	NA	NA	NA
Water Truck	NA	1	3	60	480	480	8	NA	NA	NA	NA
Concrete Truck	NA	1	0.25	5	40	40	NA	32	2	2	30
Worker commute	NA	11	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	100000	2500	ft^3	40
Grading	2	0.2	acre	10
Soil Loading	231	23	yd^3	10

Appendix C:

Table C4: Construction Equipment Usage (Case-in-place) - Alternative 3 (continued)

SR47 9: Striping, Lighting and Signing

Construction duration from 9/1/2009 to 8/30/2011

Number of construction Workers 14 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Boom	NA	2	2	40	320	640	8	NA	NA	NA	NA
Loader	NA	1	1.5	30	240	240	8	NA	NA	NA	NA
Generator	NA	4	3	60	480	1920	8	NA	NA	NA	NA
Flatbed	NA	2	3	60	480	960	NA	50	1.5	6	44
Pick Up	NA	4	3	60	480	1920	NA	50	1.5	10	40
Compressor	NA	2	3	60	480	960	8	NA	NA	NA	NA
Striper (Truck)	NA	1	1	20	160	160	8	NA	NA	NA	NA
Worker commute	NA	14	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	29452	982	ft^3	30

SHB and SR-47: Stockpile Area

Construction duration from 1/11/2009 to 8/30/2011

	Maximum Area Covered	**Unit**
Stock Piles	2	acres/day

1. Construction data provided by DMJM Harris, May 2005
2. Stock pile areas were not specified for each construction phases. The maximum areas that might be covered each day by the whole project was used to calculate the total fugitive dust emissions from stock piles.
3. Detailed Flyover construction emission calculations are presented in Appendix A1.

Appendix C:

Table C5: Emission Factors (Case-in-place) - Alternative 3

SHB 1: Clearing, Grubbing & Earthwork

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe/excavator	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.05143	0.000
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Haul Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.00069	0.211
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211

SHB 2. Shaft and Columns - Drilled Shaft Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
200 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.06237	0.000
Caisson Drill	Bore/Drill Rigs	2009	lb/hr	0.520	1.229	0.116	0.002	0.054	0.000	0.04974	0.000
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.06237	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.03808	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.00069	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.0008	0.997	0.00069	0.211
Concrete Pump Truc	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.08546	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.05028	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.08546	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.00000	0.000
Soil loading	Soil loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.00000	0.008
Stock piles											

Appendix C:

Table C5: Emission Factors (Case-in-place) - Alternative 3 (continued)

SHB 3. Shaft and Columns - Footing Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe/excavator	Tractors/Loaders/Backhoes	2010	lb/hr	0.393	0.675	0.102	0.001	0.052	0.000	0.04789	0.000
140 ton crane	Cranes	2010	lb/hr	0.543	1.451	0.159	0.001	0.064	0.000	0.05908	0.000
Generator	Generator Sets	2010	lb/hr	0.329	0.644	0.096	0.001	0.040	0.000	0.03646	0.000
Haul Truck	On-road Delivery	2010	lb/VMT	0.018	0.021	0.003	0.00003	0.00075	0.997	0.00064	0.211
Pick Up	On-road passenger	2010	lb/VMT	0.008	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Concrete Truck	On-road Delivery	2010	lb/VMT	0.018	0.021	0.003	0.00003	0.0008	0.997	0.00064	0.211
Concrete Pump Truc	Off-Highway Trucks	2010	lb/hr	0.743	2.388	0.248	0.003	0.088	0.000	0.08051	0.000
Compressor	Air compressor	2010	lb/hr	0.361	0.732	0.112	0.001	0.053	0.000	0.04843	0.000
Water Truck	Off-Highway Trucks	2010	lb/hr	0.743	2.388	0.248	0.003	0.088	0.000	0.08051	0.000
Worker commute	On-road passenger	2010	lb/VMT	0.008	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Excavation	Excavation	2010	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.00000	0.000
Soil loading	Soil loading	2010	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.00000	0.008
Stock piles											

SHB 4. Shaft and Columns - Column Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.06237	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.03808	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.00069	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.0008	0.997	0.00069	0.211
Concrete Pump Truc	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.08546	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.05028	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211

Appendix C:

Table C5: Emission Factors (Case-in-place) - Alternative 3 (continued)

SHB 5: Falsework

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.06237	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.03808	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.00069	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Rough Terrain (f - lif	Rough Terrain Forklifts	2009	lb/hr	0.482	0.851	0.137	0.001	0.072	0.000	0.06610	0.000
Scissor Lift	Other Construction Equipme	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.04332	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.05028	0.000
Boom	Other Construction Equipme	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.04332	0.000
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.00200	1.861	0.00175	0.395
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.05143	0.000
Tug boat	Ship	2009	lb/VMT	5.878	23.677	0.893	0.016	0.616	0.000	0.56671	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211

SHB 6. Superstructure - Approach Span Erection

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
275 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.06237	0.000
Rough Terrain (f-lift)	Rough Terrain Forklifts	2009	lb/hr	0.482	0.851	0.137	0.001	0.072	0.000	0.06610	0.000
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.06237	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.03808	0.000
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.00200	1.861	0.00175	0.395
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.00069	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.0008	0.997	0.00069	0.211
Concrete Pump Truc	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.08546	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.05028	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.00000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.00000	5.491
Soil loading	Soil loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.00000	0.008
Stock piles											

Appendix C:

Table C5: Emission Factors (Case-in-place) - Alternative 3 (continued)

SHB 7. Superstructure - Main Span Erection

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
275 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.06237	0.000
Rough Terrain (f-lift)	Rough Terrain Forklifts	2009	lb/hr	0.482	0.851	0.137	0.001	0.072	0.000	0.06610	0.000
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.06237	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.03808	0.000
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.00200	1.861	0.00175	0.395
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.00069	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.0008	0.997	0.00069	0.211
Concrete Pump Truc	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.08546	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.05028	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.00000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.00000	5.491
Soil loading	Soil loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.00000	0.008
Stock piles											

SHB 8. Bridge Demolition (including both approaches)

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Haul Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.00069	0.211
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.05028	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.03808	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.00069	0.211
Backhoe/excavator	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.05143	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.05143	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Demolition	Demolition	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.00000	0.000
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.00000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.00000	5.491
Soil loading	Soil loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.00000	0.008
Stock piles											

Appendix C:

Table C5: Emission Factors (Case-in-place) - Alternative 3 (continued)

SHB 9. Barriers and Joints

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.9973	0.00005	0.211
Concrete Trucks	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.9973	0.00069	0.211
Flatbed Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.9973	0.00069	0.211
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.00200	1.8611	0.00175	0.395
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.9973	0.00005	0.211

SHB 10. Stripping, Lighting, and Signing

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Paint truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.08546	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.05028	0.000
Bucket Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.08546	0.000
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.00200	1.861	0.00175	0.395
Boom Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.08546	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.00000	0.000

Appendix C:

Table C5: Emission Factors (Case-in-place) - Alternative 3 (continued)

SR-47 1. Site Preparation - Earthwork

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Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.05143	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.05143	0.000
Haulers (Truck)	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.00069	0.211
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.03808	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.00069	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Grader	Graders	2009	lb/hr	0.643	1.524	0.183	0.001	0.080	0.000	0.07321	0.000
Vibratory loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.05143	0.000
Asphalt Paver	Pavers	2009	lb/hr	0.576	1.032	0.187	0.001	0.074	0.000	0.06797	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.05028	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.08546	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211

SR-47 2. Site Preparation - Drilled Shaft Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
200 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.06237	0.000
Caisson Drill	Bore/Drill Rigs	2009	lb/hr	0.520	1.229	0.116	0.002	0.054	0.000	0.04974	0.000
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.06237	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.03808	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.00069	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.0008	0.997	0.00069	0.211
Concrete Pump Truc	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.08546	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.05028	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.08546	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Demolition	Demolition	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.00000	0.000
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.00000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.00000	5.491
Soil Loading	Soil Loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.00000	0.008
Stock piles											

Appendix C:

Table C5: Emission Factors (Case-in-place) - Alternative 3 (continued)

SR47 3: Foundation Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe/excavator	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.05143	0.000
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.06237	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.03808	0.000
Haul Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.00069	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.0008	0.997	0.00069	0.211
Concrete Pump Truc	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.08546	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.05028	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.08546	0.000
Pile Driver	Other Construction Equipme	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.04332	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.00000	0.000
Soil Loading	Soil Loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.00000	0.008
Stock piles											

SR47 5: Falsework

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.06237	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.03808	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.00069	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.0008	0.997	0.00069	0.211
Concrete Pump Truc	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.08546	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.05028	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211

Appendix C:

Table C5: Emission Factors (Case-in-place) - Alternative 3 (continued)

SR47 5: Falsework

Emission Factors (see Appendix I for details and reference of emission factors)

Equipment Descripti	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
100 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.06237	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.03808	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.00069	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Rough Terrain (f - lif	Rough Terrain Forklifts	2009	lb/hr	0.482	0.851	0.137	0.001	0.072	0.000	0.06610	0.000
Scissor Lift	Other Construction Equipme	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.04332	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.05028	0.000
Boom	Other Construction Equipme	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.04332	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211

SR47 6: Superstructure - Span Erection

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
275 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.06237	0.000
Rough Terrain (f-lift)	Rough Terrain Forklifts	2009	lb/hr	0.482	0.851	0.137	0.001	0.072	0.000	0.06610	0.000
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.06237	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.03808	0.000
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.00200	1.861	0.00175	0.395
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.00069	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.0008	0.997	0.00069	0.211
Concrete Pump Truc	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.08546	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.05028	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Demolition	Demolition	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.00000	0.00009
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.00000	0.00009
grading	grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.00000	5.491
paving	paving	2009	lb ROG / acre	0.000	0.000	2.620	0.000	0.000	0.000	0.00000	0.000

Appendix C:

Table C5: Emission Factors (Case-in-place) - Alternative 3 (continued)

SR47 7: Drainage

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.05143	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.05143	0.000
Haulers (Truck)	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.00069	0.211
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.03808	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.00069	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Vibratory Roller	Rollers	2009	lb/hr	0.427	0.817	0.125	0.001	0.057	0.000	0.05279	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.05028	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.08546	0.000
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.0008	0.997	0.00069	0.211
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Demolition	Demolition	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.00000	0.000
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.00000	0.000
grading	grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.00000	5.491
Paving	Paving	2009	lb ROG / acre	0.000	0.000	2.620	0.000	0.000	0.000	0.00000	0.000
Soil dumping	Soil dumping	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.016	0.00000	0.003
Stock piles											

SR47 8: Retaining Walls and Soundwalls

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.05143	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.05143	0.000
Haulers (Truck)	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.00069	0.211
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.03808	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.00069	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Vibratory Roller	Rollers	2009	lb/hr	0.427	0.817	0.125	0.001	0.057	0.000	0.05279	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.05028	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.08546	0.000
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.0008	0.997	0.00069	0.211
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.0004	0.00000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.00000	5.491
Soil Loading	Soil Loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.00000	0.008
stock piles											

Appendix C:

Table C5: Emission Factors (Case-in-place) - Alternative 3 (continued)

SR47 9: Striping, Lighting and Signing

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Boom	Other Construction Equipme	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.04332	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.05143	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.03808	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.00069	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.05028	0.000
Striper (Truck)	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.08546	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.00005	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.000	0.00000	0.000

SHB and SR-47: Stockpile Area

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Stock piles	Stock piles	All	lb/acre/day	0.000	0.000	0.000	0.000	0.000	39.908	0.00000	8.301

Note:

1. Stock pile areas were not specified or calculated for each construction phases. The maximum areas that might be covered each day by the whole project was used to calculate the total fugitive dust emissions from stock piles.
2. Detailed references of the emission factors are in Appendix I.

Appendix C:

Table C6: Daily Emissions (Case-in-place) - Alternative 3

SHB 1: Clearing, Grubbing & Earthwork

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
Pick Up	0.581	0.060	0.060	0.001	0.005	4.987	0.003	1.057
Haul Truck	2.016	2.237	0.279	0.003	0.081	3.989	0.069	0.846
Worker commute	1.550	0.161	0.159	0.002	0.014	0.000	0.009	0.000
Total	7.341	8.239	1.384	0.011	0.547	8.976	0.493	1.903

SHB 1: Clearing, Grubbing & Earthwork

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.1943	5.7812	0.8869	0.0062	0.4472	0.0000	0.4114	0.0000
Pick Up	0.5811	0.0603	0.0595	0.0006	0.0052	2.7427	0.0032	0.5814
Haul Truck	2.0161	2.2366	0.2789	0.0027	0.0805	2.1941	0.0692	0.4652
Worker commute	1.5497	0.1608	0.1588	0.0017	0.0138	0.0000	0.0086	0.0000
Total	7.3412	8.2390	1.3841	0.0112	0.5467	4.9368	0.4925	1.0466

0

SHB 2. Shaft and Columns - Drilled Shaft Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
200 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Caisson Drill	4.160	9.830	0.929	0.014	0.432	0.000	0.398	0.000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Concrete Truck	6.451	7.157	0.892	0.009	0.258	9.973	0.222	2.114
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.000	0.030	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.017	0.000	0.003
Soil loading	0.000	0.000	0.000	0.000	0.000	1.886	0.000	0.392
Total	52.147	103.364	12.517	0.117	4.556	63.737	4.146	13.505

0

SHB 2. Shaft and Columns - Drilled Shaft Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
200 ton crane	4.564	12.235	1.347	0.011	0.542	0.0000	0.4990	0.0000
Caisson Drill	4.160	9.830	0.929	0.014	0.432	0.0000	0.3979	0.0000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.0000	0.4990	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.0000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.5824	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.9413	0.0162	4.6516
Concrete Truck	6.451	7.157	0.892	0.009	0.258	5.4853	0.2215	1.1629
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.0000	0.6837	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.0000	0.4022	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.0000	0.6837	0.0000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.0000	0.0302	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.0054	0.0000	0.0011
Soil loading	0.000	0.000	0.000	0.000	0.000	0.6034	0.0000	0.1255
Total	52.147	103.364	12.517	0.117	4.556	34.618	4.146	7.337

Appendix C:

Table C6: Daily Emissions (Case-in-place) - Alternative 3 (continued)

SHB 3. Shaft and Columns - Footing Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.144	5.398	0.816	0.006	0.416	0.000	0.383	0.000
140 ton crane	4.345	11.612	1.275	0.011	0.514	0.000	0.473	0.000
Generator	2.634	5.152	0.769	0.006	0.317	0.000	0.292	0.000
Haul Truck	7.375	8.250	1.036	0.011	0.300	15.957	0.257	3.383
Pick Up	1.239	0.138	0.137	0.002	0.013	19.947	0.008	4.229
Concrete Truck	11.800	13.200	1.657	0.017	0.481	19.947	0.411	4.229
Concrete Pump Truck	5.943	19.108	1.984	0.021	0.700	0.000	0.644	0.000
Compressor	2.890	5.856	0.896	0.006	0.421	0.000	0.387	0.000
Water Truck	5.943	19.108	1.984	0.021	0.700	0.000	0.644	0.000
Worker commute	2.314	0.257	0.256	0.003	0.024	0.000	0.015	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.036	0.000	0.007
Soil loading	0.000	0.000	0.000	0.000	0.000	1.176	0.000	0.245
Total	47.628	88.079	10.811	0.104	3.887	57.063	3.515	12.092

SHB 3. Shaft and Columns - Footing Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.144	5.398	0.816	0.006	0.416	0.0000	0.3831	0.0000
140 ton crane	4.345	11.612	1.275	0.011	0.514	0.0000	0.4726	0.0000
Generator	2.634	5.152	0.769	0.006	0.317	0.0000	0.2917	0.0000
Haul Truck	7.375	8.250	1.036	0.011	0.300	8.7765	0.2569	1.8606
Pick Up	1.239	0.138	0.137	0.002	0.013	10.9707	0.0082	2.3258
Concrete Truck	11.800	13.200	1.657	0.017	0.481	10.9707	0.4111	2.3258
Concrete Pump Truck	5.943	19.108	1.984	0.021	0.700	0.0000	0.6441	0.0000
Compressor	2.890	5.856	0.896	0.006	0.421	0.0000	0.3874	0.0000
Water Truck	5.943	19.108	1.984	0.021	0.700	0.0000	0.6441	0.0000
Worker commute	2.314	0.257	0.256	0.003	0.024	0.0000	0.0153	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.0115	0.0000	0.0024
Soil loading	0.000	0.000	0.000	0.000	0.000	0.3763	0.0000	0.0783
Total	47.628	88.079	10.811	0.104	3.887	31.106	3.515	6.593

SHB 4. Shaft and Columns - Column Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.305	0.000
Flatbed	1.512	1.677	0.209	0.002	0.060	5.984	0.052	1.269
Pick Up	1.453	0.151	0.149	0.002	0.013	19.947	0.008	4.229
Concrete Truck	4.516	5.010	0.625	0.006	0.180	6.981	0.155	1.480
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.015	0.000
Total	26.764	51.264	6.444	0.056	2.332	32.912	2.120	6.977

SHB 4. Shaft and Columns - Column Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.3046	0.0000
Flatbed	1.512	1.677	0.209	0.002	0.060	3.291	0.0519	0.6977
Pick Up	1.453	0.151	0.149	0.002	0.013	10.971	0.0081	2.3258
Concrete Truck	4.516	5.010	0.625	0.006	0.180	3.840	0.1551	0.8140
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.4022	0.0000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.0151	0.0000
Total	26.764	51.264	6.444	0.056	2.332	18.102	2.120	3.838

Appendix C:

Table C6: Daily Emissions (Case-in-place) - Alternative 3 (continued)

SHB 5: Falsework

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.998	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Rough Terrain (f - lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.115	0.000
Scissor Lift	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Boom	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Semi Truck	2.564	8.369	0.659	0.008	0.399	372.218	0.350	78.910
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Tug boat	47.028	189.413	7.146	0.128	4.928	0.000	4.534	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Total	117.315	322.900	25.096	0.273	12.847	424.079	11.773	89.905

SHB 5: Falsework

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.9980	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Rough Terrain (f - lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.1153	0.0000
Scissor Lift	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.8045	0.0000
Boom	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Semi Truck	2.564	8.369	0.659	0.008	0.399	204.720	0.3505	43.4006
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Tug boat	47.028	189.413	7.146	0.128	4.928	0.000	4.5337	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.0323	0.0000
Total	117.315	322.900	25.096	0.273	12.847	233.244	11.773	49.448

0

SHB 6. Superstructure - Approach Span Erection

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Rough Terrain (f-lift)	7.704	13.608	2.188	0.013	1.150	0.000	1.058	0.000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.219	0.000
Semi Truck	2.154	7.030	0.553	0.007	0.335	14.889	0.294	3.156
Flatbed	9.072	10.065	1.255	0.012	0.362	35.904	0.312	7.612
Pick Up	7.264	0.754	0.744	0.008	0.065	99.733	0.040	21.143
Concrete Truck	12.903	14.314	1.785	0.017	0.516	19.947	0.443	4.229
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.609	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.891	0.000	0.185
Grading	0.000	0.000	0.000	0.000	0.000	2.640	0.000	0.549
Soil loading	0.000	0.000	0.000	0.000	0.000	3.120	0.000	0.649
Total	89.374	157.675	21.008	0.173	8.123	177.124	7.372	37.524

0

SHB 6. Superstructure - Approach Span Erection

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Rough Terrain (f-lift)	7.704	13.608	2.188	0.013	1.150	0.000	1.0576	0.0000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.2185	0.0000
Semi Truck	2.154	7.030	0.553	0.007	0.335	8.189	0.2944	1.7360
Flatbed	9.072	10.065	1.255	0.012	0.362	19.747	0.3115	4.1864
Pick Up	7.264	0.754	0.744	0.008	0.065	54.853	0.0404	11.6289
Concrete Truck	12.903	14.314	1.785	0.017	0.516	10.971	0.4431	2.3258
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.3674	0.0000
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.6090	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.0323	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.285	0.0000	0.0593
Grading	0.000	0.000	0.000	0.000	0.000	0.845	0.0000	0.1757
Soil loading	0.000	0.000	0.000	0.000	0.000	0.998	0.0000	0.2077
Total	89.374	157.675	21.008	0.173	8.123	95.888	7.372	20.320

Appendix C:

Table C6: Daily Emissions (Case-in-place) - Alternative 3 (continued)

SHB 7. Superstructure - Main Span Erection

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.998	0.000
Rough Terrain (f-lift)	7.704	13.608	2.188	0.013	1.150	0.000	1.058	0.000
140 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.998	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Semi Truck	2.154	7.030	0.553	0.007	0.335	14.889	0.294	3.156
Flatbed	7.560	8.387	1.046	0.010	0.302	29.920	0.260	6.343
Pick Up	7.264	0.754	0.744	0.008	0.065	99.733	0.040	21.143
Concrete Truck	12.903	14.314	1.785	0.017	0.516	19.947	0.443	4.229
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.081	0.000	0.017
Grading	0.000	0.000	0.000	0.000	0.000	1.320	0.000	0.275
Soil loading	0.000	0.000	0.000	0.000	0.000	0.085	0.000	0.018
Total	85.667	157.456	19.973	0.171	7.611	165.974	6.905	35.181

SHB 7. Superstructure - Main Span Erection

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.9980	0.0000
Rough Terrain (f-lift)	7.704	13.608	2.188	0.013	1.150	0.000	1.0576	0.0000
140 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.9980	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Semi Truck	2.154	7.030	0.553	0.007	0.335	8.189	0.2944	1.7360
Flatbed	7.560	8.387	1.046	0.010	0.302	16.456	0.2596	3.4887
Pick Up	7.264	0.754	0.744	0.008	0.065	54.853	0.0404	11.6289
Concrete Truck	12.903	14.314	1.785	0.017	0.516	10.971	0.4431	2.3258
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.3674	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.8045	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.0323	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.026	0.0000	0.0054
Grading	0.000	0.000	0.000	0.000	0.000	0.422	0.0000	0.0879
Soil loading	0.000	0.000	0.000	0.000	0.000	0.027	0.0000	0.0057
Total	85.667	157.456	19.973	0.171	7.611	90.944	6.905	19.278

SHB 8. Bridge Demolition (including both approaches)

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	4.359	0.452	0.447	0.005	0.039	59.840	0.024	12.686
Haul Truck	20.161	22.366	2.789	0.027	0.805	39.893	0.692	8.457
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.609	0.000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.219	0.000
Flatbed	6.048	6.710	0.837	0.008	0.242	23.936	0.208	5.074
Backhoe/excavator	12.777	23.125	3.547	0.025	1.789	0.000	1.646	0.000
Loader	9.583	17.344	2.661	0.019	1.342	0.000	1.234	0.000
Worker commute	6.199	0.643	0.635	0.007	0.055	0.000	0.034	0.000
Demolition	0.000	0.000	0.000	0.000	0.000	0.164	0.000	0.034
Excavation	0.000	0.000	0.000	0.000	0.000	0.282	0.000	0.059
Grading	0.000	0.000	0.000	0.000	0.000	2.640	0.000	0.549
Soil loading	0.000	0.000	0.000	0.000	0.000	0.592	0.000	0.123
Total	81.775	116.663	17.954	0.135	7.345	127.348	6.666	26.983

SHB 8. Bridge Demolition (including both approaches)

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	4.359	0.452	0.447	0.005	0.039	32.912	0.0242	6.9773
Haul Truck	20.161	22.366	2.789	0.027	0.805	21.941	0.6923	4.6516
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.6090	0.0000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.2185	0.0000
Flatbed	6.048	6.710	0.837	0.008	0.242	13.165	0.2077	2.7909
Backhoe/excavator	12.777	23.125	3.547	0.025	1.789	0.000	1.6457	0.0000
Loader	9.583	17.344	2.661	0.019	1.342	0.000	1.2343	0.0000
Worker commute	6.199	0.643	0.635	0.007	0.055	0.000	0.0345	0.0000
Demolition	0.000	0.000	0.000	0.000	0.000	0.053	0.0000	0.0109
Excavation	0.000	0.000	0.000	0.000	0.000	0.090	0.0000	0.0188
Grading	0.000	0.000	0.000	0.000	0.000	0.845	0.0000	0.1757
Soil loading	0.000	0.000	0.000	0.000	0.000	0.190	0.0000	0.0394
Total	81.775	116.663	17.954	0.135	7.345	69.195	6.666	14.665

Appendix C:

Table C6: Daily Emissions (Case-in-place) - Alternative 3 (continued)

SHB 9. Barriers and Joints

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	0.484	0.050	0.050	0.001	0.004	5.984	0.003	1.269
Concrete Trucks	2.581	2.863	0.357	0.003	0.103	3.989	0.089	0.846
Flatbed Truck	0.806	0.895	0.112	0.001	0.032	3.989	0.028	0.846
Semi Truck	0.539	1.758	0.138	0.002	0.084	3.722	0.074	0.789
Worker commute	3.099	0.322	0.318	0.003	0.028	0.000	0.017	0.000
Total	7.509	5.887	0.974	0.010	0.251	17.685	0.210	3.749

SHB 9. Barriers and Joints

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	0.484	0.050	0.050	0.001	0.004	3.291	0.0027	0.6977
Concrete Trucks	2.581	2.863	0.357	0.003	0.103	2.194	0.0886	0.4652
Flatbed Truck	0.806	0.895	0.112	0.001	0.032	2.194	0.0277	0.4652
Semi Truck	0.539	1.758	0.138	0.002	0.084	2.047	0.0736	0.4340
Worker commute	3.099	0.322	0.318	0.003	0.028	0.000	0.0172	0.0000
Total	7.509	5.887	0.974	0.010	0.251	9.727	0.210	2.062

SHB 10. Stripping, Lighting, and Signing

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Paint truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Bucket Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Semi Truck	1.077	3.515	0.277	0.003	0.168	7.444	0.147	1.578
Boom Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	3.874	0.402	0.397	0.004	0.034	0.000	0.022	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.247	0.000	0.051
Total	36.194	91.966	10.225	0.102	3.638	47.585	3.322	10.087

SHB 10. Stripping, Lighting, and Signing

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Paint truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.4022	0.0000
Bucket Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.3674	0.0000
Semi Truck	1.077	3.515	0.277	0.003	0.168	4.094	0.1472	0.8680
Boom Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Worker commute	3.874	0.402	0.397	0.004	0.034	0.000	0.0215	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.079	0.0000	0.0165
Total	36.194	91.966	10.225	0.102	3.638	26.115	3.322	5.536

Appendix C:

Table C6: Daily Emissions (Case-in-place) - Alternative 3 (continued)

SR-47 1. Site Preparation - Earthwork

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Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Haulers (Truck)	8.064	8.947	1.116	0.011	0.322	15.957	0.277	3.383
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Grader	10.285	24.380	2.920	0.024	1.273	0.000	1.171	0.000
Vibratory loader	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Asphalt Paver	4.605	8.257	1.494	0.007	0.591	0.000	0.544	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Total	71.530	123.946	17.759	0.136	7.348	67.819	6.710	14.378

SR-47 1. Site Preparation - Earthwork

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Haulers (Truck)	8.064	8.947	1.116	0.011	0.322	8.777	0.2769	1.8606
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Grader	10.285	24.380	2.920	0.024	1.273	0.000	1.1714	0.0000
Vibratory loader	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Asphalt Paver	4.605	8.257	1.494	0.007	0.591	0.000	0.5437	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.8045	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.0323	0.0000
Total	71.530	123.946	17.759	0.136	7.348	37.300	6.710	7.908

SR-47 2. Site Preparation - Drilled Shaft Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
200 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Caisson Drill	4.160	9.830	0.929	0.014	0.432	0.000	0.398	0.000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Concrete Truck	6.451	7.157	0.892	0.009	0.258	9.973	0.222	2.114
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.000	0.030	0.000
Demolition	0.000	0.000	0.000	0.000	0.000	0.095	0.000	0.020
Excavation	0.000	0.000	0.000	0.000	0.000	0.114	0.000	0.024
Grading	0.000	0.000	0.000	0.000	0.000	2.640	0.000	0.549
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.083	0.000	0.017
Total	52.147	103.364	12.517	0.117	4.556	64.767	4.146	13.719

SR-47 2. Site Preparation - Drilled Shaft Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
200 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Caisson Drill	4.160	9.830	0.929	0.014	0.432	0.000	0.3979	0.0000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Concrete Truck	6.451	7.157	0.892	0.009	0.258	5.485	0.2215	1.1629
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.4022	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.000	0.0302	0.0000
Demolition	0.000	0.000	0.000	0.000	0.000	0.030	0.0000	0.0063
Excavation	0.000	0.000	0.000	0.000	0.000	0.036	0.0000	0.0076
Grading	0.000	0.000	0.000	0.000	0.000	0.845	0.0000	0.1757
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.027	0.0000	0.0055
Total	52.147	103.364	12.517	0.117	4.556	34.947	4.146	7.405

Appendix C:

Table C6: Daily Emissions (Case-in-place) - Alternative 3 (continued)

SR47 3: Foundation Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Haul Truck	8.064	8.947	1.116	0.011	0.322	15.957	0.277	3.383
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Concrete Truck	2.581	2.863	0.357	0.003	0.103	3.989	0.089	0.846
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Pile Driver	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.015	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.034	0.000	0.007
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.024	0.000	0.005
Total	64.439	137.713	16.729	0.150	6.432	59.898	5.877	12.698

SR47 3: Foundation Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Haul Truck	8.064	8.947	1.116	0.011	0.322	8.777	0.2769	1.8606
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Concrete Truck	2.581	2.863	0.357	0.003	0.103	2.194	0.0886	0.4652
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.3674	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.8045	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Pile Driver	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.0151	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.011	0.0000	0.0023
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.008	0.0000	0.0016
Total	64.439	137.713	16.729	0.150	6.432	32.931	5.877	6.981

SR47 5: Falsework

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.305	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Concrete Truck	2.581	2.863	0.357	0.003	0.103	3.989	0.089	0.846
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.015	0.000
Total	27.793	50.945	6.535	0.057	2.328	55.851	2.113	11.840

SR47 5: Falsework

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.3046	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Concrete Truck	2.581	2.863	0.357	0.003	0.103	2.194	0.0886	0.4652
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.4022	0.0000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.0151	0.0000
Total	27.793	50.945	6.535	0.057	2.328	30.718	2.113	6.512

Appendix C:

Table C6: Daily Emissions (Case-in-place) - Alternative 3 (continued)

SR47 5: Falsework

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
100 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Rough Terrain (f - lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.115	0.000
Scissor Lift	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Boom	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Total	56.770	101.321	14.171	0.114	6.083	51.861	5.567	10.995

SR47 5: Falsework

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
100 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Rough Terrain (f - lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.1153	0.0000
Scissor Lift	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.8045	0.0000
Boom	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.0323	0.0000
Total	56.770	101.321	14.171	0.114	6.083	28.524	5.567	6.047

SR47 6: Superstructure - Span Erection

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Rough Terrain (f-lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.115	0.000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.219	0.000
Semi Truck	2.154	7.030	0.553	0.007	0.335	14.889	0.294	3.156
Flatbed	6.048	6.710	0.837	0.008	0.242	23.936	0.208	5.074
Pick Up	7.264	0.754	0.744	0.008	0.065	99.733	0.040	21.143
Concrete Truck	15.483	17.177	2.142	0.021	0.619	23.936	0.532	5.074
Concrete Pump Truck	25.378	81.616	8.310	0.085	2.973	0.000	2.735	0.000
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.609	0.000
Worker commute	9.686	1.005	0.992	0.011	0.086	0.000	0.054	0.000
Demolition	0.000	0.000	0.000	0.000	0.000	5.040	0.000	1.048
Excavation	0.000	0.000	0.000	0.000	0.000	0.504	0.000	0.105
grading	0.000	0.000	0.000	0.000	0.000	7.920	0.000	1.647
paving	0.000	0.000	0.393	0.000	0.000	0.000	0.000	0.000
Total	113.198	212.001	28.080	0.232	10.776	175.958	9.804	37.249

SR47 6: Superstructure - Span Erection

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Rough Terrain (f-lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.1153	0.0000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.2185	0.0000
Semi Truck	2.154	7.030	0.553	0.007	0.335	8.189	0.2944	1.7360
Flatbed	6.048	6.710	0.837	0.008	0.242	13.165	0.2077	2.7909
Pick Up	7.264	0.754	0.744	0.008	0.065	54.853	0.0404	11.6289
Concrete Truck	15.483	17.177	2.142	0.021	0.619	13.165	0.5317	2.7909
Concrete Pump Truck	25.378	81.616	8.310	0.085	2.973	0.000	2.7348	0.0000
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.6090	0.0000
Worker commute	9.686	1.005	0.992	0.011	0.086	0.000	0.0538	0.0000
Demolition	0.000	0.000	0.000	0.000	0.000	1.613	0.0000	0.3355
Excavation	0.000	0.000	0.000	0.000	0.000	0.161	0.0000	0.0335
grading	0.000	0.000	0.000	0.000	0.000	2.534	0.0000	0.5272
paving	0.000	0.000	0.393	0.000	0.000	0.000	0.0000	0.0000
Total	113.198	212.001	28.080	0.232	10.776	93.680	9.804	19.843

Appendix C:

Table C6: Daily Emissions (Case-in-place) - Alternative 3 (continued)

SR47 7: Drainage
Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
Loader	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
Haulers (Truck)	4.032	4.473	0.558	0.005	0.161	7.979	0.138	1.691
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	6.048	6.710	0.837	0.008	0.242	23.936	0.208	5.074
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Vibratory Roller	6.836	13.065	2.000	0.012	0.918	0.000	0.845	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.995	0.044	0.423
Worker commute	4.649	0.482	0.476	0.005	0.041	0.000	0.026	0.000
Demolition	0.000	0.000	0.000	0.000	0.000	0.277	0.000	0.058
Excavation	0.000	0.000	0.000	0.000	0.000	0.259	0.000	0.054
grading	0.000	0.000	0.000	0.000	0.000	2.640	0.000	0.549
Paving	0.000	0.000	0.175	0.000	0.000	0.000	0.000	0.000
Soil dumping	0.000	0.000	0.000	0.000	0.000	0.008	0.000	0.002
Total	49.819	81.442	11.893	0.092	4.614	76.987	4.197	16.308

SR47 7: Drainage
Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	3.194	5.781	0.887	0.006	0.447	0.000	0.4114	0.0000
Loader	3.194	5.781	0.887	0.006	0.447	0.000	0.4114	0.0000
Haulers (Truck)	4.032	4.473	0.558	0.005	0.161	4.388	0.1385	0.9303
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Flatbed	6.048	6.710	0.837	0.008	0.242	13.165	0.2077	2.7909
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Vibratory Roller	6.836	13.065	2.000	0.012	0.918	0.000	0.8446	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.8045	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.097	0.0443	0.2326
Worker commute	4.649	0.482	0.476	0.005	0.041	0.000	0.0258	0.0000
Demolition	0.000	0.000	0.000	0.000	0.000	0.089	0.0000	0.0185
Excavation	0.000	0.000	0.000	0.000	0.000	0.083	0.0000	0.0172
grading	0.000	0.000	0.000	0.000	0.000	0.845	0.0000	0.1757
Paving	0.000	0.000	0.175	0.000	0.000	0.000	0.0000	0.0000
Soil dumping	0.000	0.000	0.000	0.000	0.000	0.003	0.0000	0.0005
Total	49.819	81.442	11.893	0.092	4.614	41.610	4.197	8.817

SR47 8: Retaining Walls and Soundwalls
Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Haulers (Truck)	8.064	8.947	1.116	0.011	0.322	15.957	0.277	3.383
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	1.453	0.151	0.149	0.002	0.013	19.947	0.008	4.229
Vibratory Roller	6.836	13.065	2.000	0.012	0.918	0.000	0.845	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.995	0.044	0.423
Worker commute	4.262	0.442	0.437	0.005	0.038	0.000	0.024	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	1.050	0.000	0.218
Grading	0.000	0.000	0.000	0.000	0.000	5.280	0.000	1.098
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.919	0.000	0.191
Total	55.375	93.931	13.443	0.104	5.532	57.115	5.045	12.079

SR47 8: Retaining Walls and Soundwalls
Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Haulers (Truck)	8.064	8.947	1.116	0.011	0.322	8.777	0.2769	1.8606
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	1.453	0.151	0.149	0.002	0.013	10.971	0.0081	2.3258
Vibratory Roller	6.836	13.065	2.000	0.012	0.918	0.000	0.8446	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.8045	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.097	0.0443	0.2326
Worker commute	4.262	0.442	0.437	0.005	0.038	0.000	0.0237	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.336	0.0000	0.0699
Grading	0.000	0.000	0.000	0.000	0.000	1.690	0.0000	0.3514
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.294	0.0000	0.0612
Total	55.375	93.931	13.443	0.104	5.532	29.746	5.045	6.297

Appendix C:

Table C6: Daily Emissions (Case-in-place) - Alternative 3 (continued)

SR47 9: Striping, Lighting and Signing
Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Boom	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Loader	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.219	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Striper (Truck)	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.000	0.030	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.412	0.000	0.086
Total	44.488	81.465	11.196	0.095	4.338	52.274	3.961	11.080

SR47 9: Striping, Lighting and Signing
Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Boom	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Loader	3.194	5.781	0.887	0.006	0.447	0.000	0.4114	0.0000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.2185	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.8045	0.0000
Striper (Truck)	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.000	0.0302	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.132	0.0000	0.0274
Total	44.488	81.465	11.196	0.095	4.338	28.656	3.961	6.074

SHB and SR-47: Stockpile Area
Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Stock piles	0.000	0.000	0.000	0.000	0.000	79.8	0.0	16.6

SHB and SR-47: Stockpile Area
Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day

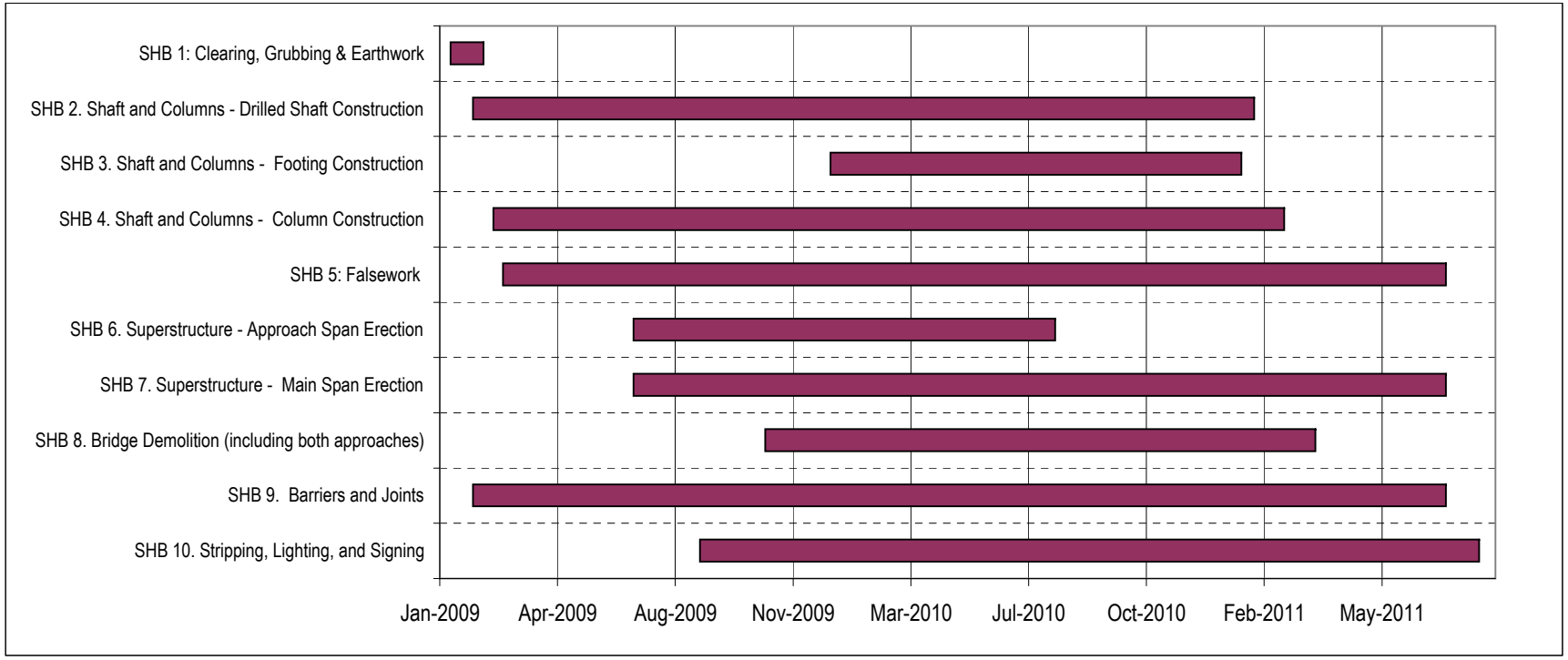
	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Stock piles	0.000	0.000	0.000	0.000	0.000	25.541	0.0000	5.3125

Note:
Stock pile areas were not specified or calculated for each construction phases. The maximum areas that might be covered each day by the whole project was used to calculate the total fugitive dust emissions from stock piles.

Appendix D
Construction Emission Calculations – Alternative 4, CIP Method

Appendix D:

Table D1: Construction Schedule (Case-in-place) - Alternative 4



Source: DMJM Harris, May 2005

Appendix D:

Table D2: Maximum Construction Emissions: By Source (Case-in-place) - Alternative 4

Maximum Daily Construction Emissions

		CO (lb/day)	NOx (lb/day)	ROG (lb/day)	SOx (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
With Watering to Control Fugitive Dust	Maximum Construction Equipment Exhaust	503	1091	121	1	50	236
	Maximu Workers Commute	41	4.3	4.2	0.05	0.37	0.23
	Maximum Fugitive Dust	NA	NA	NA	NA	635	134
	Maximum Combined Daily Emissions	**544**	**1095**	**125**	**1.1**	**685**	**180**
SCAQMD Thresholds		550	100	75	150	150	55
Exceeding Thresholds?		NO	YES	YES	NO	YES	YES

Note:The maximum daily emissions from equipment exhaust, fugitive dust, and workers commute are not additive because these worst case emissions do not always occur on the same day.

Appendix D:
Table D3. Summary of Daily Emissions (Case-in-place) - Alternative 4

Construction Phases		Total Emissions without Watering (lb/day)									
		CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	PM_{10} Total	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Total
1	SHB 1: Clearing, Grubbing & Earthwork	7.34	8.24	1.38	0.01	0.55	8.98	9.52	1.90	1.90	3.81
2	SHB 2. Shaft and Columns - Drilled Shaft Construction	52.15	103.36	12.52	0.12	4.56	63.74	68.29	13.50	13.50	27.01
3	SHB 3. Shaft and Columns - Footing Construction	47.63	88.08	10.81	0.10	3.89	57.06	60.95	12.09	12.09	24.18
4	SHB 4. Shaft and Columns - Column Construction	26.76	51.26	6.44	0.06	2.33	32.91	35.24	6.98	6.98	13.95
5	SHB 5: Falsework	117.31	322.90	25.10	0.27	12.85	424.08	436.93	89.90	89.90	179.81
6	SHB 6. Superstructure - Approach Span Erection	89.37	157.67	21.01	0.17	8.12	177.12	185.25	37.52	37.52	75.05
7	SHB 7. Superstructure - Main Span Erection	85.67	157.46	19.97	0.17	7.61	165.97	173.59	35.18	35.18	70.36
8	SHB 8. Bridge Demolition (including both approaches)	81.77	116.66	17.95	0.13	7.34	127.35	134.69	26.98	26.98	53.97
9	SHB 9. Barriers and Joints	7.51	5.89	0.97	0.01	0.25	17.68	17.94	3.75	3.75	7.50
10	SHB 10. Stripping, Lighting, and Signing	36.19	91.97	10.22	0.10	3.64	47.75	51.39	10.12	10.12	20.24
	SHB SR47 Stock Piles (entire project)	0.00	0.00	0.00	0.00	0.00	79.82	79.82	0.00	16.60	16.60
	Overlapping phases										
	2,3,4,5,6,7,8,9,10	544	1095	125	1.1	51	1193	1244	236	253	489
	Max. Daily Emissions	**544**	**1095**	**125**	**1.1**	**51**	**1193**	**1244**	**236**	**253**	**489**

Note:
1. Based on the construction schedule, emissions from overlapping construction phases were added together to evaluate the worst case scenarios. The maximum daily emissions represent the scenario of overlapping phases with the highest emissions.
2. Fugitive dust emissions from stock piles were not calculated for each construction phase. The emissions were calculated separately based on a maximum area that the stock piles will cover during the entire construction duration.
3. The fugitive dusts were assumed to be controlled by 68% by watering the site 3 times per day, and 45% by watering the unpaved roads 3 times a day, according to the control efficiencies in SCAQMD CEQA Air Quality Handbook Table 11-4.

Appendix D:
Table D3. Summary of Daily Emissions (Case-in-plac

Construction Phases		Total Emissions with Watering (lb/day)									
		CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	PM_{10} Total	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Total
1	SHB 1: Clearing, Grubbing & Earthwork	7.34	8.24	1.38	0.01	0.55	4.94	5.48	0.49	1.05	1.54
2	SHB 2. Shaft and Columns - Drilled Shaft Construction	52.15	103.36	12.52	0.12	4.56	34.62	39.17	4.15	7.34	11.48
3	SHB 3. Shaft and Columns - Footing Construction	47.63	88.08	10.81	0.10	3.89	31.11	34.99	3.51	6.59	10.11
4	SHB 4. Shaft and Columns - Column Construction	26.76	51.26	6.44	0.06	2.33	18.10	20.43	2.12	3.84	5.96
5	SHB 5: Falsework	117.31	322.90	25.10	0.27	12.85	233.24	246.09	11.77	49.45	61.22
6	SHB 6. Superstructure - Approach Span Erection	89.37	157.67	21.01	0.17	8.12	95.89	104.01	7.37	20.32	27.69
7	SHB 7. Superstructure - Main Span Erection	85.67	157.46	19.97	0.17	7.61	90.94	98.56	6.90	19.28	26.18
8	SHB 8. Bridge Demolition (including both approaches)	81.77	116.66	17.95	0.13	7.34	69.20	76.54	6.67	14.66	21.33
9	SHB 9. Barriers and Joints	7.51	5.89	0.97	0.01	0.25	9.73	9.98	0.21	2.06	2.27
10	SHB 10. Stripping, Lighting, and Signing	36.19	91.97	10.22	0.10	3.64	26.17	29.81	3.32	5.55	8.87
	SHB SR47 Stock Piles (entire project)	0.00	0.00	0.00	0.00	0.00	25.54	25.54	0.00	5.31	5.31
	Overlapping phases										
	2,3,4,5,6,7,8,9,10	544	1095	125	1.1	51	635	685	46	134	180
	Max. Daily Emissions	**544**	**1095**	**125**	**1.1**	**51**	**635**	**685**	**46**	**134**	**180**

Appendix D:
Table D3. Summary of Daily Emissions (Case-in-plac

		Construction Equipment Exhaust (lb/day)						Workers Commute (lb/day)					
Construction Phases		**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**$PM_{2.5}$ Exhaust**	**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**$PM_{2.5}$ Exhaust**
1	SHB 1: Clearing, Grubbing & Earthwork	5.79	8.08	1.23	0.01	0.53	1.89	1.550	0.161	0.159	0.002	0.014	0.009
2	SHB 2. Shaft and Columns - Drilled Shaft Construction	46.72	102.80	11.96	0.11	4.51	13.47	5.424	0.563	0.556	0.006	0.048	0.030
3	SHB 3. Shaft and Columns - Footing Construction	45.31	87.82	10.56	0.10	3.86	12.08	2.314	0.257	0.256	0.003	0.024	0.015
4	SHB 4. Shaft and Columns - Column Construction	24.05	50.98	6.17	0.05	2.31	6.96	2.712	0.281	0.278	0.003	0.024	0.015
5	SHB 5: Falsework	111.50	322.30	24.50	0.27	12.80	89.87	5.811	0.603	0.595	0.006	0.052	0.032
6	SHB 6. Superstructure - Approach Span Erection	83.56	157.07	20.41	0.17	8.07	37.49	5.811	0.603	0.595	0.006	0.052	0.032
7	SHB 7. Superstructure - Main Span Erection	79.86	156.85	19.38	0.16	7.56	35.15	5.811	0.603	0.595	0.006	0.052	0.032
8	SHB 8. Bridge Demolition (including both approaches)	75.58	116.02	17.32	0.13	7.29	26.95	6.199	0.643	0.635	0.007	0.055	0.034
9	SHB 9. Barriers and Joints	4.41	5.57	0.66	0.01	0.22	3.73	3.099	0.322	0.318	0.003	0.028	0.017
10	SHB 10. Stripping, Lighting, and Signing	32.32	91.56	9.83	0.10	3.60	10.10	3.874	0.402	0.397	0.004	0.034	0.022
	SHB SR47 Stock Piles (entire project)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Overlapping phases												
	2,3,4,5,6,7,8,9,10	503	1091	121	1.1	50	236	41	4.28	4.23	0.05	0.37	0.23
	Max. Daily Emissions	**503**	**1091**	**121**	**1.1**	**50**	**236**	**41**	**4.28**	**4.23**	**0.05**	**0.37**	**0.23**

Appendix D:

Table D4: Construction Equipment Usage (Case-in-place) - Alternative 4

Schuyler Heim Bridge (SHB)

SHB 1: Clearing, Grubbing & Earthwork

Construction duration from 1/11/2009 to 2/11/2009 This work will occur in stages as work areas become available.

Number of construction Workers 4 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe/excavator	NA	1	1	20	8	160	8	NA	NA	NA	NA
Pick Up	NA	1	1	20	4	80	NA	60	1	5	55
Haul Truck	NA	1	1	20	4	80	NA	50	2	4	46
Worker commute	NA	4	NA	NA	NA	NA	NA	40	1	0	40

SHB 2. Shaft and Columns - Drilled Shaft Construction

Construction duration from 2/1/2009 to 2/1/2011

Number of construction Workers 14 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**CIDH**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per CIDH**	**per CIDH**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
200 ton crane	NA	1	87	10	80	6960	8	NA	NA	NA	NA
Caisson Drill	NA	1	87	4	32	2784	8	NA	NA	NA	NA
140 ton crane	NA	1	87	7	56	4872	8	NA	NA	NA	NA
Generator	NA	2	87	10	80	13920	8	NA	NA	NA	NA
Flatbed	NA	2	87	10	80	13920	NA	50	1.5	6	44
Pick Up	NA	4	87	10	80	27840	NA	50	1.5	10	40
Concrete Truck	NA	5	87	2	16	6960	NA	32	2	2	30
Concrete Pump Truck	NA	1	87	2	16	1392	8	NA	NA	NA	NA
Compressor	NA	1	87	1	8	696	8	NA	NA	NA	NA
Water Truck	NA	1	87	4	32	2784	8	NA	NA	NA	NA
Worker commute	NA	14	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	3848	40	ft^3	290
Soil loading	333	47.5	yd^3	7.0

Appendix D:

Table D4: Construction Equipment Usage (Case-in-place) - Alternative 4 (continued)

SHB 3. Shaft and Columns - Footing Construction

Construction duration from 1/1/2010 to 1/20/2011

Number of construction Workers 7 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Embank. Wall**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per Wall**	**per Wall**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe/excavator	NA	1	2	5	40	80	8	NA	NA	NA	NA
140 ton crane	NA	1	2	2	16	32	8	NA	NA	NA	NA
Generator	NA	1	2	10	80	160	8	NA	NA	NA	NA
Haul Truck	NA	4	2	5	40	320	NA	50	2	4	46
Pick Up	NA	2	2	10	80	320	NA	50	1.5	10	40
Concrete Truck	NA	10	2	2	16	320	NA	32	2	2	30
Concrete Pump Truck	NA	1	2	2	16	32	8	NA	NA	NA	NA
Compressor	NA	1	2	10	80	160	8	NA	NA	NA	NA
Water Truck	NA	1	2	4	32	64	8	NA	NA	NA	NA
Worker commute	NA	7	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	2400	86	ft^3	28
Soil loading	207	30	yd^3	7

SHB 4. Shaft and Columns - Column Construction

Construction duration from 2/20/2009 to 3/1/2011

Number of construction Workers 7 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Columns**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per Col.**	**per Col.**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
140 ton crane	NA	1	87	1	8	696	8	NA	NA	NA	NA
Generator	NA	1	87	4	32	2784	8	NA	NA	NA	NA
Flatbed	NA	1	87	2.5	20	1740	NA	50	1.5	6	44
Pick Up	NA	2	87	4	32	5568	NA	50	1.5	10	40
Concrete Truck	NA	3.5	87	1	8	2436	NA	32	2	2	30
Concrete Pump Truck	NA	1	87	1	8	696	8	NA	NA	NA	NA
Compressor	NA	1	87	4	32	2784	8	NA	NA	NA	NA
Worker commute	NA	7	NA	NA	NA	NA	NA	40	1	0	40

Appendix D:

Table D4: Construction Equipment Usage (Case-in-place) - Alternative 4 (continued)

SHB 5: Falsework

Construction duration from 3/1/2009 to 7/30/2011

Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
140 ton crane	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
Generator	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
Flatbed	NA	2	20	400	3200	6400	NA	50	1.5	6	44
Pick Up	NA	4	20	400	3200	12800	NA	50	1.5	10	40
Rough Terrain (f - lift)	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
Scissor Lift	NA	2	15	300	2400	4800	8	NA	NA	NA	NA
Compressor	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
Boom	NA	2	15	300	2400	4800	8	NA	NA	NA	NA
Semi Truck	NA	10	0.5	10	20	200	8	20	1	20	0
Loader	NA	2	1	20	160	320	8	NA	NA	NA	NA
Tug boat	NA	1	1.5	30	240	240	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

SHB 6. Superstructure - Approach Span Erection

Construction duration from 7/1/2009 to 7/30/2010

Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
275 ton crane	NA	1	18	360	2880	2880	8	NA	NA	NA	NA
Rough Terrain (f-lift)	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
140 ton crane	NA	1	20	400	3200	3200	8	NA	NA	NA	NA
Generator	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
Semi Truck	NA	4	10	200	1600	6400		42	1	2	40
Flatbed	NA	6	12	240	1920	11520	NA	50	1.5	6	44
Pick Up	NA	10	20	400	3200	32000	NA	50	1.5	10	40
Concrete Truck	NA	10	10	200	1600	16000	NA	32	2	2	30
Concrete Pump Truck	NA	2	10	200	1600	3200	8	NA	NA	NA	NA
Compressor	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	127340	2122	ft^3	60
Grading	2	0.1	acre	20
Soil loading	1572	79	yd^3	20

Appendix D:

Table D4: Construction Equipment Usage (Case-in-place) - Alternative 4 (continued)

SHB 7. Superstructure - Main Span Erection

Construction duration from 7/1/2009 to 7/30/2011

Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
275 ton crane	NA	2	8	160	1280	2560	8	NA	NA	NA	NA
Rough Terrain (f-lift)	NA	2	10	200	1600	3200	8	NA	NA	NA	NA
140 ton crane	NA	2	10	200	1600	3200	8	NA	NA	NA	NA
Generator	NA	2	18	360	2880	5760	8	NA	NA	NA	NA
Semi Truck	NA	4	10	200	1600	6400	NA	42	1	2	40
Flatbed	NA	5	18	360	2880	14400	NA	50	1.5	6	44
Pick Up	NA	10	18	360	2880	28800	NA	50	1.5	10	40
Concrete Truck	NA	10	10	200	1600	16000	NA	32	2	2	30
Concrete Pump Truck	NA	2	10	200	1600	3200	8	NA	NA	NA	NA
Compressor	NA	2	18	360	2880	5760	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	11550	192.5	ft^3	60
Grading	1.5	0.1	acre	30
Soil loading	42.8	2	yd^3	20

SHB 8. Bridge Demolition (including both approaches)

Construction duration from 11/1/2009 to 3/30/2011

Number of construction Workers 16 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Pick Up	NA	6	6	120	3	2160	NA	50	1.5	10	40
Haul Truck	NA	10	6	120	4	4800	NA	50	2	4	46
Compressor	NA	4	6	120	8	3840	8	NA	NA	NA	NA
Generator	NA	4	6	120	6	2880	8	NA	NA	NA	NA
Flatbed	NA	4	6	120	3	1440	NA	50	1.5	6	44
Backhoe/excavator	NA	4	6	120	8	3840	8	NA	NA	NA	NA
Loader	NA	3	6	120	4	1440	8	NA	NA	NA	NA
Worker commute	NA	16	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Demolition	62500	391	ft^3	160
Excavation	40300	672	ft^4	60
Grading	2	0.1	acre	20
Soil loading	299	15	yd^3	20

Appendix D:

Table D4: Construction Equipment Usage (Case-in-place) - Alternative 4 (continued)

SHB 9. Barriers and Joints

Construction duration from 2/1/2009 to 7/30/2011

Number of construction Workers 8 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Pick Up	NA	1	4	80	320	320	NA	50	1	6	44
Concrete Trucks	NA	2	4	80	640	1280	NA	32	2	2	30
Flatbed Truck	NA	1	4	80	320	320	NA	40	1	4	36
Semi Truck	NA	1	4	80	320	320		42	1	2	40
Worker commute	NA	8	NA	NA	NA	NA	NA	40	1	0	40

SHB 10. Stripping, Lighting, and Signing

Construction duration from 9/1/2009 to 8/30/2011

Number of construction Workers 10 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Pick Up	NA	4	1.5	30	3	360	NA	50	1.5	10	40
Paint truck	NA	1	1	20	7	140	8	NA	NA	NA	NA
Compressor	NA	1	1	20	7	140	8	NA	NA	NA	NA
Bucket Truck	NA	2	1.5	30	5	300	8	NA	NA	NA	NA
Semi Truck	NA	2	0.5	10	4	80		42	1	2	40
Boom Truck	NA	1	0.5	10	6	60	8	NA	NA	NA	NA
Worker commute	NA	10	NA	NA	NA	NA	NA	40	1	0	40
	Total Amount	**Daily Amount**	**Unit**	**duration**							
excavation	29452	982	ft^3	30							

SHB: Stockpile Area

Construction duration from 1/11/2009 to 8/30/2011

	Maximum Area Covered	Unit
Stock Piles	2	acres/day

1. Construction data provided by DMJM Harris, May 2005
2. Stock pile areas were not specified for each construction phases. The maximum areas that might be covered each day by the whole project was used to calculate the total fugitive dust emissions from stock piles.
3. Detailed Flyover construction emission calculations are presented in Appendix A1.

Appendix D:

Table D5: Emission Factors (Case-in-place) - Alternative 4

SHB 1: Clearing, Grubbing & Earthwork

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe/excavator	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Haul Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211

SHB 2. Shaft and Columns - Drilled Shaft Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
200 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Caisson Drill	Bore/Drill Rigs	2009	lb/hr	0.520	1.229	0.116	0.002	0.054	0.000	0.050	0.000
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Soil loading	Soil loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

Appendix D:

Table D5: Emission Factors (Case-in-place) - Alternative 4 (continued)

SHB 3. Shaft and Columns - Footing Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe/excavator	Tractors/Loaders/Backhoes	2010	lb/hr	0.393	0.675	0.102	0.001	0.052	0.000	0.048	0.000
140 ton crane	Cranes	2010	lb/hr	0.543	1.451	0.159	0.001	0.064	0.000	0.059	0.000
Generator	Generator Sets	2010	lb/hr	0.329	0.644	0.096	0.001	0.040	0.000	0.036	0.000
Haul Truck	On-road Delivery	2010	lb/VMT	0.018	0.021	0.003	0.00003	0.00075	0.997	0.001	0.211
Pick Up	On-road passenger	2010	lb/VMT	0.008	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2010	lb/VMT	0.018	0.021	0.003	0.00003	0.00075	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2010	lb/hr	0.743	2.388	0.248	0.003	0.088	0.000	0.081	0.000
Compressor	Air compressor	2010	lb/hr	0.361	0.732	0.112	0.001	0.053	0.000	0.048	0.000
Water Truck	Off-Highway Trucks	2010	lb/hr	0.743	2.388	0.248	0.003	0.088	0.000	0.081	0.000
Worker commute	On-road passenger	2010	lb/VMT	0.008	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2010	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Soil loading	Soil loading	2010	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

SHB 4. Shaft and Columns - Column Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211

Appendix D:

Table D5: Emission Factors (Case-in-place) - Alternative 4 (continued)

SHB 5: Falsework

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Rough Terrain (f - lift)	Rough Terrain Forklifts	2009	lb/hr	0.482	0.851	0.137	0.001	0.072	0.000	0.066	0.000
Scissor Lift	Other Construction Equipmer	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.043	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Boom	Other Construction Equipmer	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.043	0.000
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.002	1.861	0.002	0.395
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Tug boat	Ship	2009	lb/VMT	5.878	23.677	0.893	0.016	0.616	0.000	0.567	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211

SHB 6. Superstructure - Approach Span Erection

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
275 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Rough Terrain (f-lift)	Rough Terrain Forklifts	2009	lb/hr	0.482	0.851	0.137	0.001	0.072	0.000	0.066	0.000
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.002	1.861	0.002	0.395
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Soil loading	Soil loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

Appendix D:

Table D5: Emission Factors (Case-in-place) - Alternative 4 (continued)

SHB 7. Superstructure - Main Span Erection

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
275 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Rough Terrain (f-lift)	Rough Terrain Forklifts	2009	lb/hr	0.482	0.851	0.137	0.001	0.072	0.000	0.066	0.000
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.002	1.861	0.002	0.395
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Soil loading	Soil loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

SHB 8. Bridge Demolition (including both approaches)

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Haul Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Backhoe/excavator	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Demolition	Demolition	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Soil loading	Soil loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

Appendix D:

Table D5: Emission Factors (Case-in-place) - Alternative 4 (continued)

SHB 9. Barriers and Joints

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.9973	0.000	0.211
Concrete Trucks	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.9973	0.001	0.211
Flatbed Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.9973	0.001	0.211
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.002	1.8611	0.002	0.395
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.9973	0.000	0.211

SHB 10. Stripping, Lighting, and Signing

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Paint truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Bucket Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.002	1.861	0.002	0.395
Boom Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000

SHB: Stockpile Area

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Stock piles	Stock piles	All	lb/acre/day	0.000	0.000	0.000	0.000	0.000	39.90780	0.00000	8.30082

Note:
1. Stock pile areas were not specified or calculated for each construction phases. The maximum areas that might be covered each day by the whole project was used to calculate the total fugitive dust emissions from stock piles.
2. Detailed references of the emission factors are in Appendix I.

Appendix D:

Table D6: Daily Emissions (Case-in-place) - Alternative 4

SHB 1: Clearing, Grubbing & Earthwork

Emissions without Watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
Pick Up	0.581	0.060	0.060	0.001	0.005	4.987	0.003	1.057
Haul Truck	2.016	2.237	0.279	0.003	0.081	3.989	0.069	0.846
Worker commute	1.550	0.161	0.159	0.002	0.014	0.000	0.009	0.000
Total	7.341	8.239	1.384	0.011	0.547	8.976	1.903	1.903

SHB 1: Clearing, Grubbing & Earthwork

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.1943	5.7812	0.8869	0.0062	0.4472	0.0000	0.4114	0.0000
Pick Up	0.5811	0.0603	0.0595	0.0006	0.0052	2.7427	0.0032	0.5814
Haul Truck	2.0161	2.2366	0.2789	0.0027	0.0805	2.1941	0.0692	0.4652
Worker commute	1.5497	0.1608	0.1588	0.0017	0.0138	0.0000	0.0086	0.0000
Total	7.3412	8.2390	1.3841	0.0112	0.5467	4.9368	0.4925	1.0466

0

SHB 2. Shaft and Columns - Drilled Shaft Construction

Emissions without Watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day		
200 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Caisson Drill	4.160	9.830	0.929	0.014	0.432	0.000	0.398	0.000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Concrete Truck	6.451	7.157	0.892	0.009	0.258	9.973	0.222	2.114
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.000	0.030	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.017	0.000	0.003
Soil loading	0.000	0.000	0.000	0.000	0.000	1.886	0.000	0.392
Total	52.147	103.364	12.517	0.117	4.556	63.737	13.505	13.505

0

SHB 2. Shaft and Columns - Drilled Shaft Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
200 ton crane	4.564	12.235	1.347	0.011	0.542	0.0000	0.4990	0.0000
Caisson Drill	4.160	9.830	0.929	0.014	0.432	0.0000	0.3979	0.0000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.0000	0.4990	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.0000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.5824	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.9413	0.0162	4.6516
Concrete Truck	6.451	7.157	0.892	0.009	0.258	5.4853	0.2215	1.1629
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.0000	0.6837	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.0000	0.4022	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.0000	0.6837	0.0000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.0000	0.0302	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.0054	0.0000	0.0011
Soil loading	0.000	0.000	0.000	0.000	0.000	0.6034	0.0000	0.1255
Total	52.147	103.364	12.517	0.117	4.556	34.618	4.146	7.337

Appendix D:

Table D6: Daily Emissions (Case-in-place) - Alternative 4 (continued)

SHB 3. Shaft and Columns - Footing Construction

Emissions without Watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day		
Backhoe/excavator	3.144	5.398	0.816	0.006	0.416	0.000	0.383	0.000
140 ton crane	4.345	11.612	1.275	0.011	0.514	0.000	0.473	0.000
Generator	2.634	5.152	0.769	0.006	0.317	0.000	0.292	0.000
Haul Truck	7.375	8.250	1.036	0.011	0.300	15.957	0.257	3.383
Pick Up	1.239	0.138	0.137	0.002	0.013	19.947	0.008	4.229
Concrete Truck	11.800	13.200	1.657	0.017	0.481	19.947	0.411	4.229
Concrete Pump Truck	5.943	19.108	1.984	0.021	0.700	0.000	0.644	0.000
Compressor	2.890	5.856	0.896	0.006	0.421	0.000	0.387	0.000
Water Truck	5.943	19.108	1.984	0.021	0.700	0.000	0.644	0.000
Worker commute	2.314	0.257	0.256	0.003	0.024	0.000	0.015	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.036	0.000	0.007
Soil loading	0.000	0.000	0.000	0.000	0.000	1.176	0.000	0.245
Total	47.628	88.079	10.811	0.104	3.887	57.063	12.092	12.092

SHB 3. Shaft and Columns - Footing Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.144	5.398	0.816	0.006	0.416	0.0000	0.3831	0.0000
140 ton crane	4.345	11.612	1.275	0.011	0.514	0.0000	0.4726	0.0000
Generator	2.634	5.152	0.769	0.006	0.317	0.0000	0.2917	0.0000
Haul Truck	7.375	8.250	1.036	0.011	0.300	8.7765	0.2569	1.8606
Pick Up	1.239	0.138	0.137	0.002	0.013	10.9707	0.0082	2.3258
Concrete Truck	11.800	13.200	1.657	0.017	0.481	10.9707	0.4111	2.3258
Concrete Pump Truck	5.943	19.108	1.984	0.021	0.700	0.0000	0.6441	0.0000
Compressor	2.890	5.856	0.896	0.006	0.421	0.0000	0.3874	0.0000
Water Truck	5.943	19.108	1.984	0.021	0.700	0.0000	0.6441	0.0000
Worker commute	2.314	0.257	0.256	0.003	0.024	0.0000	0.0153	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.0115	0.0000	0.0024
Soil loading	0.000	0.000	0.000	0.000	0.000	0.3763	0.0000	0.0783
Total	47.628	88.079	10.811	0.104	3.887	31.106	3.515	6.593

SHB 4. Shaft and Columns - Column Construction

Emissions without Watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day		
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.305	0.000
Flatbed	1.512	1.677	0.209	0.002	0.060	5.984	0.052	1.269
Pick Up	1.453	0.151	0.149	0.002	0.013	19.947	0.008	4.229
Concrete Truck	4.516	5.010	0.625	0.006	0.180	6.981	0.155	1.480
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.015	0.000
Total	26.764	51.264	6.444	0.056	2.332	32.912	6.977	6.977

SHB 4. Shaft and Columns - Column Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.0000	0.4990	0.0000
Generator	2.703	5.375	0.816	0.006	0.331	0.0000	0.3046	0.0000
Flatbed	1.512	1.677	0.209	0.002	0.060	3.2912	0.0519	0.6977
Pick Up	1.453	0.151	0.149	0.002	0.013	10.9707	0.0081	2.3258
Concrete Truck	4.516	5.010	0.625	0.006	0.180	3.8397	0.1551	0.8140
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.0000	0.6837	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.0000	0.4022	0.0000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.0000	0.0151	0.0000
Total	26.764	51.264	6.444	0.056	2.332	18.102	2.120	3.838

Appendix D:

Table D6: Daily Emissions (Case-in-place) - Alternative 4 (continued)

SHB 5: Falsework

Emissions without Watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day		
140 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.998	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Rough Terrain (f - lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.115	0.000
Scissor Lift	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Boom	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Semi Truck	2.564	8.369	0.659	0.008	0.399	372.218	0.350	78.910
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Tug boat	47.028	189.413	7.146	0.128	4.928	0.000	4.534	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Total	117.315	322.900	25.096	0.273	12.847	424.079	89.905	89.905

SHB 5: Falsework

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	9.128	24.470	2.693	0.022	1.085	0.0000	0.9980	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.0000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.5824	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.9413	0.0162	4.6516
Rough Terrain (f - lift)	15.408	27.216	4.377	0.026	2.299	0.0000	2.1153	0.0000
Scissor Lift	6.866	17.299	1.808	0.020	0.753	0.0000	0.6932	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.0000	0.8045	0.0000
Boom	6.866	17.299	1.808	0.020	0.753	0.0000	0.6932	0.0000
Semi Truck	2.564	8.369	0.659	0.008	0.399	204.7199	0.3505	43.4006
Loader	6.389	11.562	1.774	0.012	0.894	0.0000	0.8229	0.0000
Tug boat	47.028	189.413	7.146	0.128	4.928	0.0000	4.5337	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.0000	0.0323	0.0000
Total	117.315	322.900	25.096	0.273	12.847	233.244	11.773	49.448

0

SHB 6. Superstructure - Approach Span Erection

Emissions without Watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day		
275 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Rough Terrain (f-lift)	7.704	13.608	2.188	0.013	1.150	0.000	1.058	0.000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.219	0.000
Semi Truck	2.154	7.030	0.553	0.007	0.335	14.889	0.294	3.156
Flatbed	9.072	10.065	1.255	0.012	0.362	35.904	0.312	7.612
Pick Up	7.264	0.754	0.744	0.008	0.065	99.733	0.040	21.143
Concrete Truck	12.903	14.314	1.785	0.017	0.516	19.947	0.443	4.229
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.609	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.891	0.000	0.185
Grading	0.000	0.000	0.000	0.000	0.000	2.640	0.000	0.549
Soil loading	0.000	0.000	0.000	0.000	0.000	3.120	0.000	0.649
Total	89.374	157.675	21.008	0.173	8.123	177.124	37.524	37.524

0

SHB 6. Superstructure - Approach Span Erection

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	4.564	12.235	1.347	0.011	0.542	0.0000	0.4990	0.0000
Rough Terrain (f-lift)	7.704	13.608	2.188	0.013	1.150	0.0000	1.0576	0.0000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.0000	0.4990	0.0000
Generator	10.811	21.498	3.264	0.022	1.324	0.0000	1.2185	0.0000
Semi Truck	2.154	7.030	0.553	0.007	0.335	8.1888	0.2944	1.7360
Flatbed	9.072	10.065	1.255	0.012	0.362	19.7472	0.3115	4.1864
Pick Up	7.264	0.754	0.744	0.008	0.065	54.8533	0.0404	11.6289
Concrete Truck	12.903	14.314	1.785	0.017	0.516	10.9707	0.4431	2.3258
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.0000	1.3674	0.0000
Compressor	11.837	24.524	3.774	0.023	1.749	0.0000	1.6090	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.0000	0.0323	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.2852	0.0000	0.0593
Grading	0.000	0.000	0.000	0.000	0.000	0.8448	0.0000	0.1757
Soil loading	0.000	0.000	0.000	0.000	0.000	0.9983	0.0000	0.2077
Total	89.374	157.675	21.008	0.173	8.123	95.888	7.372	20.320

Appendix D:

Table D6: Daily Emissions (Case-in-place) - Alternative 4 (continued)

SHB 7. Superstructure - Main Span Erection

Emissions without Watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day		
275 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.998	0.000
Rough Terrain (f-lift)	7.704	13.608	2.188	0.013	1.150	0.000	1.058	0.000
140 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.998	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Semi Truck	2.154	7.030	0.553	0.007	0.335	14.889	0.294	3.156
Flatbed	7.560	8.387	1.046	0.010	0.302	29.920	0.260	6.343
Pick Up	7.264	0.754	0.744	0.008	0.065	99.733	0.040	21.143
Concrete Truck	12.903	14.314	1.785	0.017	0.516	19.947	0.443	4.229
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.081	0.000	0.017
Grading	0.000	0.000	0.000	0.000	0.000	1.320	0.000	0.275
Soil loading	0.000	0.000	0.000	0.000	0.000	0.085	0.000	0.018
Total	85.667	157.456	19.973	0.171	7.611	165.974	35.181	35.181

SHB 7. Superstructure - Main Span Erection

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	9.128	24.470	2.693	0.022	1.085	0.0000	0.9980	0.0000
Rough Terrain (f-lift)	7.704	13.608	2.188	0.013	1.150	0.0000	1.0576	0.0000
140 ton crane	9.128	24.470	2.693	0.022	1.085	0.0000	0.9980	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.0000	0.6093	0.0000
Semi Truck	2.154	7.030	0.553	0.007	0.335	8.1888	0.2944	1.7360
Flatbed	7.560	8.387	1.046	0.010	0.302	16.4560	0.2596	3.4887
Pick Up	7.264	0.754	0.744	0.008	0.065	54.8533	0.0404	11.6289
Concrete Truck	12.903	14.314	1.785	0.017	0.516	10.9707	0.4431	2.3258
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.0000	1.3674	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.0000	0.8045	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.0000	0.0323	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.0259	0.0000	0.0054
Grading	0.000	0.000	0.000	0.000	0.000	0.4224	0.0000	0.0879
Soil loading	0.000	0.000	0.000	0.000	0.000	0.0272	0.0000	0.0057
Total	85.667	157.456	19.973	0.171	7.611	90.944	6.905	19.278

SHB 8. Bridge Demolition (including both approaches)

Emissions without Watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day		
Pick Up	4.359	0.452	0.447	0.005	0.039	59.840	0.024	12.686
Haul Truck	20.161	22.366	2.789	0.027	0.805	39.893	0.692	8.457
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.609	0.000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.219	0.000
Flatbed	6.048	6.710	0.837	0.008	0.242	23.936	0.208	5.074
Backhoe/excavator	12.777	23.125	3.547	0.025	1.789	0.000	1.646	0.000
Loader	9.583	17.344	2.661	0.019	1.342	0.000	1.234	0.000
Worker commute	6.199	0.643	0.635	0.007	0.055	0.000	0.034	0.000
Demolition	0.000	0.000	0.000	0.000	0.000	0.164	0.000	0.034
Excavation	0.000	0.000	0.000	0.000	0.000	0.282	0.000	0.059
Grading	0.000	0.000	0.000	0.000	0.000	2.640	0.000	0.549
Soil loading	0.000	0.000	0.000	0.000	0.000	0.592	0.000	0.123
Total	81.775	116.663	17.954	0.135	7.345	127.348	26.983	26.983

SHB 8. Bridge Demolition (including both approaches)

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	4.359	0.452	0.447	0.005	0.039	32.9120	0.0242	6.9773
Haul Truck	20.161	22.366	2.789	0.027	0.805	21.9413	0.6923	4.6516
Compressor	11.837	24.524	3.774	0.023	1.749	0.0000	1.6090	0.0000
Generator	10.811	21.498	3.264	0.022	1.324	0.0000	1.2185	0.0000
Flatbed	6.048	6.710	0.837	0.008	0.242	13.1648	0.2077	2.7909
Backhoe/excavator	12.777	23.125	3.547	0.025	1.789	0.0000	1.6457	0.0000
Loader	9.583	17.344	2.661	0.019	1.342	0.0000	1.2343	0.0000
Worker commute	6.199	0.643	0.635	0.007	0.055	0.0000	0.0345	0.0000
Demolition	0.000	0.000	0.000	0.000	0.000	0.0525	0.0000	0.0109
Excavation	0.000	0.000	0.000	0.000	0.000	0.0903	0.0000	0.0188
Grading	0.000	0.000	0.000	0.000	0.000	0.8448	0.0000	0.1757
Soil loading	0.000	0.000	0.000	0.000	0.000	0.1896	0.0000	0.0394
Total	81.775	116.663	17.954	0.135	7.345	69.195	6.666	14.665

Appendix D:

Table D6: Daily Emissions (Case-in-place) - Alternative 4 (continued)

SHB 9. Barriers and Joints

Emissions without Watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	0.484	0.050	0.050	0.001	0.004	5.984	0.003	1.269
Concrete Trucks	2.581	2.863	0.357	0.003	0.103	3.989	0.089	0.846
Flatbed Truck	0.806	0.895	0.112	0.001	0.032	3.989	0.028	0.846
Semi Truck	0.539	1.758	0.138	0.002	0.084	3.722	0.074	0.789
Worker commute	3.099	0.322	0.318	0.003	0.028	0.000	0.017	0.000
Total	7.509	5.887	0.974	0.010	0.251	17.685	3.749	3.749

SHB 9. Barriers and Joints

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	0.484	0.050	0.050	0.001	0.004	3.2912	0.0027	0.6977
Concrete Trucks	2.581	2.863	0.357	0.003	0.103	2.1941	0.0886	0.4652
Flatbed Truck	0.806	0.895	0.112	0.001	0.032	2.1941	0.0277	0.4652
Semi Truck	0.539	1.758	0.138	0.002	0.084	2.0472	0.0736	0.4340
Worker commute	3.099	0.322	0.318	0.003	0.028	0.0000	0.0172	0.0000
Total	7.509	5.887	0.974	0.010	0.251	9.727	0.210	2.062

SHB 10. Stripping, Lighting, and Signing

Emissions without Watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Paint truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Bucket Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Semi Truck	1.077	3.515	0.277	0.003	0.168	7.444	0.147	1.578
Boom Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	3.874	0.402	0.397	0.004	0.034	0.000	0.022	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.412	0.000	0.086
Total	36.194	91.966	10.225	0.102	3.638	47.750	10.121	10.121

SHB 10. Stripping, Lighting, and Signing

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	2.906	0.302	0.298	0.003	0.026	21.9413	0.0162	4.6516
Paint truck	6.344	20.404	2.077	0.021	0.743	0.0000	0.6837	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.0000	0.4022	0.0000
Bucket Truck	12.689	40.808	4.155	0.043	1.486	0.0000	1.3674	0.0000
Semi Truck	1.077	3.515	0.277	0.003	0.168	4.0944	0.1472	0.8680
Boom Truck	6.344	20.404	2.077	0.021	0.743	0.0000	0.6837	0.0000
Worker commute	3.874	0.402	0.397	0.004	0.034	0.0000	0.0215	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.1319	0.0000	0.0274
Total	36.194	91.966	10.225	0.102	3.638	26.168	3.322	5.547

SHB: Stockpile Area

Emissions without Watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Stock piles	0.000	0.000	0.000	0.000	0.000	79.8	0.0	16.6

SHB: Stockpile Area

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Stock piles	0.000	0.000	0.000	0.000	0.000	25.5410	0.0000	5.3125

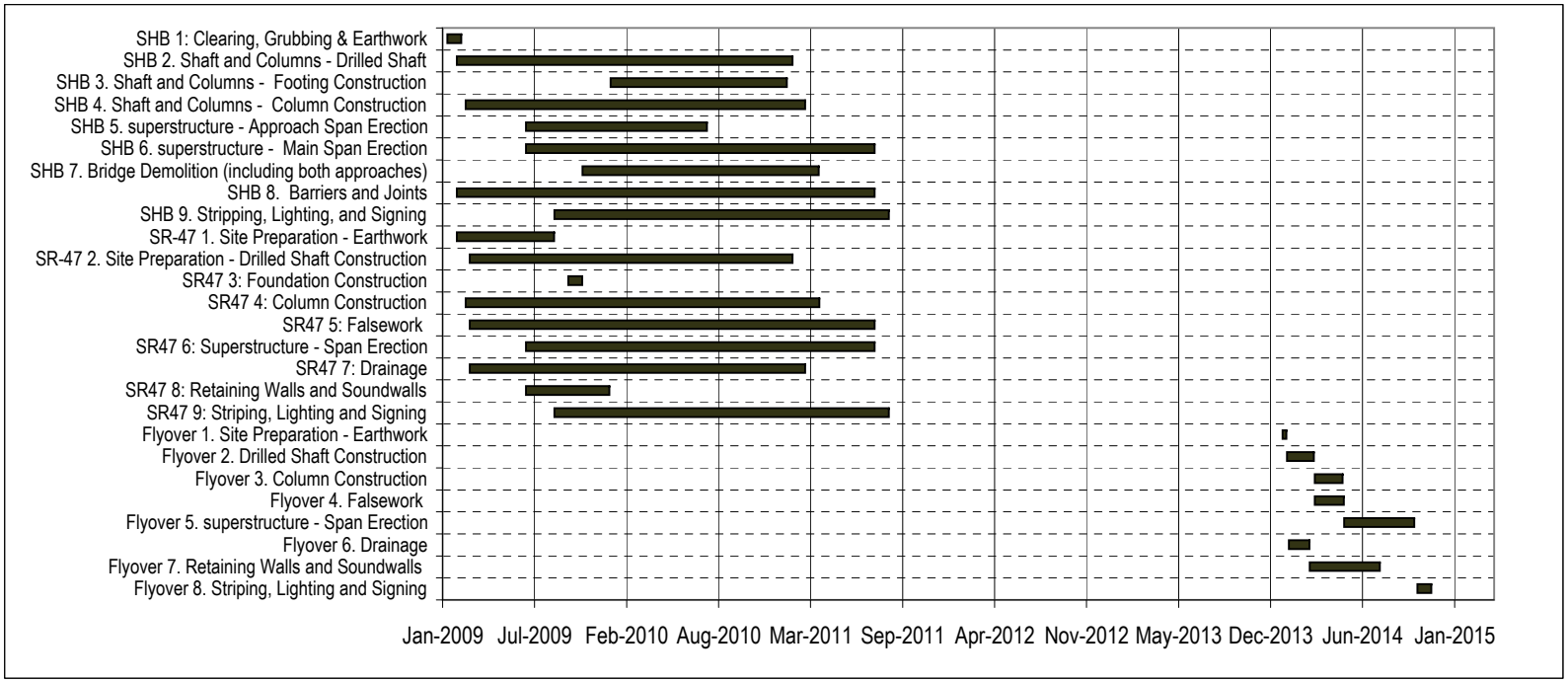
Note:

Stock pile areas were not specified or calculated for each construction phases. The maximum areas that might be covered each day by the whole project was used to calculate the total fugitive dust emissions from stock piles.

Appendix E
Construction Emission Calculations – Alternative 1, Segmental Method

Appendix E:

Table E1: Construction Schedule (Segmental) - Alternative 1



Source: DMJM Harris, May 2005 and January 2007

Appendix E:

Table E2: Maximum Construction Emissions (Segmental): By Source - Alternative 1

Maximum Daily Construction Emissions

		CO (lb/day)	NOx (lb/day)	ROG (lb/day)	SOx (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
With Mitigation to Control Fugitive Dust	Maximum Construction Equipment Exhaust	764	1546	194	1.7	78	71
	Maximum Workers Commute	67	7.0	6.9	0.07	0.60	0.35
	Maximum Fugitive Dust	NA	NA	NA	NA	716	152
	Maximum Combined Daily Emissions	**831**	**1553**	**201**	**1.7**	**795**	**223**
SCAQMD Thresholds		550	100	75	150	150	55
Exceeding Thresholds?		YES	YES	YES	NO	YES	YES

Note: The maximum daily emissions from equipment exhaust, fugitive dust, and workers commute are not additive because these worst case emissions do not always occur on the same day.

Appendix E:
Table E3. Summary of Daily Emissions (Segmental): by Construction Phase - Alternative 1

		Total Emissions without Watering (lb/day)									
	Construction Phases	**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**PM_{10} Fugitive**	**PM_{10} Total**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ Fugitive**	**$PM_{2.5}$ Total**
1	SHB 1: Clearing, Grubbing & Earthwork	7.34	8.24	1.38	0.01	0.55	8.98	9.52	0.49	1.90	2.40
2	SHB 2. Shaft and Columns - Drilled Shaft Construction	74.77	154.36	18.24	0.17	6.75	71.84	78.59	6.15	15.23	21.38
3	SHB 3. Shaft and Columns - Footing Construction	59.07	115.22	13.94	0.13	5.10	60.00	65.10	4.62	12.72	17.34
4	SHB 4. Shaft and Columns - Column Construction	33.75	72.38	8.61	0.08	3.10	33.91	37.01	2.83	7.19	10.01
5	SHB 5. Superstructure - Approach Span Erection	91.47	164.64	21.40	0.18	8.46	199.46	207.92	7.66	42.26	49.92
6	SHB 6. Superstructure - Main Span Erection	95.33	183.47	23.55	0.20	10.29	213.56	223.85	9.33	45.27	54.60
7	SHB 7. Bridge Demolition (including both approaches)	81.77	116.66	17.95	0.13	7.34	127.35	134.69	6.67	26.98	33.65
8	SHB 8. Barriers and Joints	6.73	5.81	0.89	0.01	0.24	17.68	17.93	0.21	3.75	3.95
9	SHB 9. Stripping, Lighting, and Signing	36.19	91.97	10.22	0.10	3.64	47.59	51.22	3.32	10.09	13.41
10	SR-47 1. Site Preparation - Earthwork	77.01	128.57	18.47	0.14	7.52	95.74	103.27	6.86	20.30	27.15
11	SR-47 2. Site Preparation - Drilled Shaft Construction	52.15	103.36	12.52	0.12	4.56	64.77	69.32	4.15	13.72	17.87
12	SR47 3: Foundation Construction	47.22	98.51	11.75	0.11	4.41	47.93	52.35	4.03	10.16	14.19
13	SR47 4: Column Construction	27.79	50.95	6.53	0.06	2.33	55.85	58.18	2.11	11.84	13.95
14	SR47 5: Falsework	56.77	101.32	14.17	0.11	6.08	51.86	57.94	5.57	10.99	16.56
15	SR47 6: Superstructure - Span Erection	113.20	212.00	28.08	0.23	10.78	175.96	186.73	9.80	37.25	47.05
16	SR47 7: Drainage	49.82	81.44	11.89	0.09	4.61	76.99	81.60	4.20	16.31	20.51
17	SR47 8: Retaining Walls and Soundwalls	51.00	83.86	11.86	0.09	4.82	59.11	63.93	4.38	12.50	16.88
18	SR47 9: Striping, Lighting and Signing	52.29	99.59	13.20	0.12	5.20	72.22	77.42	4.76	15.31	20.07
20	Flyover 1. Site Preparation - Earthwork	11.34	18.12	2.59	0.03	0.80	9.97	10.77	0.72	2.11	2.84
21	Flyover 2. Drilled Shaft Construction	43.65	72.98	9.52	0.13	3.19	29.96	33.16	2.89	6.35	9.24
22	Flyover 3. Column Construction	27.39	45.09	6.25	0.07	2.21	21.94	24.15	2.00	4.65	6.65
23	Flyover 4. Falsework	59.33	102.79	14.11	0.15	5.63	15.96	21.58	5.16	3.38	8.54
24	Flyover 5. superstructure - Span Erection	72.36	117.94	16.14	0.18	6.28	57.51	63.79	5.69	12.19	17.88
25	Flyover 6. Drainage	25.44	41.89	5.95	0.06	2.30	7.38	9.67	2.10	1.56	3.65
26	Flyover 7. Retaining Walls and Soundwalls	62.50	84.94	12.27	0.14	4.72	35.60	40.33	4.26	7.52	11.77
27	Flyover 8. Striping, Lighting and Signing	15.50	26.74	3.74	0.04	1.34	0.11	1.46	1.23	0.02	1.25
	SHB SR47 Stock Piles (entire project)	0.00	0.00	0.00	0.00	0.00	79.82	79.82	0.00	16.60	16.60
	Overlapping phases										
	2,4,8,10,11,13,14,16	379	698	91	0.8	35	548	584	32	116	148
	2,4,5,6,8,10,11,13,14,15,16,17	730	1342	176	1.5	70	1197	1266	63	253	316
	2,4,5,6,8,9,11,12,13,14,15,16,17,18	788	1504	193	1.7	75	1269	1344	68	268	337
	2,3,4,5,6,7,8,9,11,13,14,15,16,18	831	1553	201	1.7	78	1349	1427	71	286	357
	2,3,4,6,7,8,9,11,13,14,15,16,18	740	1389	180	1.6	70	1149	1219	64	243	307
	20	15	28	3.6	0.03	1.2	90	91	1.1	19	20
	21,25	67	113	15	0.20	5.3	117	122	4.9	25	29
	22,23,26	143	229	32	0.38	12.1	153	165	11.1	32	43
	27	15	27	3.8	0.04	1.3	80	81	1.2	17	18
	Max. Daily Emissions	**831**	**1553**	**201**	**1.7**	**78**	**1349**	**1427**	**71**	**286**	**357**

Note:
1. Based on the construction schedule, emissions from overlapping construction phases were added together to evaluate the worst case scenarios. The maximum daily emissions represent the scenario of overlapping phases with the highest emissions.
2. Fugitive dust emissions from stock piles were not calculated for each construction phase. The emissions were calculated separately based on a maximum area that the stock piles will cover during the entire construction duration.
3. The fugitive dusts were assumed to be controlled by 68% by watering the site 3 times per day, and 45% by watering the unpaved roads 3 times a day, according to the control efficiencies in SCAQMD CEQA Air Quality Handbook Table 11-4.

Appendix E:
Table E3. Summary of Daily Emissions (Segmental): by

		Total Emissions with Watering (lb/day)									
	Construction Phases	**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**PM_{10} Fugitive**	**PM_{10} Total**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ Fugitive**	**$PM_{2.5}$ Total**
1	SHB 1: Clearing, Grubbing & Earthwork	7.34	8.24	1.38	0.01	0.55	4.94	5.48	0.49	1.05	1.54
2	SHB 2. Shaft and Columns - Drilled Shaft Construction	74.77	154.36	18.24	0.17	6.75	39.51	46.25	6.15	8.38	14.52
3	SHB 3. Shaft and Columns - Footing Construction	59.07	115.22	13.94	0.13	5.10	32.96	38.06	4.62	6.99	11.61
4	SHB 4. Shaft and Columns - Column Construction	33.75	72.38	8.61	0.08	3.10	18.65	21.75	2.83	3.95	6.78
5	SHB 5. Superstructure - Approach Span Erection	91.47	164.64	21.40	0.18	8.46	108.17	116.63	7.66	22.92	30.59
6	SHB 6. Superstructure - Main Span Erection	95.33	183.47	23.55	0.20	10.29	117.12	127.40	9.33	24.83	34.16
7	SHB 7. Bridge Demolition (including both approaches)	81.77	116.66	17.95	0.13	7.34	69.20	76.54	6.67	14.66	21.33
8	SHB 8. Barriers and Joints	6.73	5.81	0.89	0.01	0.24	9.73	9.97	0.21	2.06	2.27
9	SHB 9. Stripping, Lighting, and Signing	36.19	91.97	10.22	0.10	3.64	26.11	29.75	3.32	5.54	8.86
10	SR-47 1. Site Preparation - Earthwork	77.01	128.57	18.47	0.14	7.52	52.66	60.18	6.86	11.16	18.02
11	SR-47 2. Site Preparation - Drilled Shaft Construction	52.15	103.36	12.52	0.12	4.56	34.95	39.50	4.15	7.41	11.55
12	SR47 3: Foundation Construction	47.22	98.51	11.75	0.11	4.41	26.35	30.76	4.03	5.59	9.61
13	SR47 4: Column Construction	27.79	50.95	6.53	0.06	2.33	30.72	33.05	2.11	6.51	8.63
14	SR47 5: Falsework	56.77	101.32	14.17	0.11	6.08	28.52	34.61	5.57	6.05	11.61
15	SR47 6: Superstructure - Span Erection	113.20	212.00	28.08	0.23	10.78	93.68	104.46	9.80	19.84	29.65
16	SR47 7: Drainage	49.82	81.44	11.89	0.09	4.61	41.61	46.22	4.20	8.82	13.01
17	SR47 8: Retaining Walls and Soundwalls	51.00	83.86	11.86	0.09	4.82	30.84	35.66	4.38	6.53	10.91
18	SR47 9: Striping, Lighting and Signing	52.29	99.59	13.20	0.12	5.20	39.63	44.83	4.76	8.40	13.16
20	Flyover 1. Site Preparation - Earthwork	11.34	18.12	2.59	0.03	0.80	5.49	6.28	0.72	1.16	1.88
21	Flyover 2. Drilled Shaft Construction	43.65	72.98	9.52	0.13	3.19	16.24	19.43	2.89	3.44	6.33
22	Flyover 3. Column Construction	27.39	45.09	6.25	0.07	2.21	12.07	14.27	2.00	2.56	4.55
23	Flyover 4. Falsework	59.33	102.79	14.11	0.15	5.63	8.78	14.40	5.16	1.86	7.02
24	Flyover 5. superstructure - Span Erection	72.36	117.94	16.14	0.18	6.28	31.63	37.91	5.69	6.71	12.40
25	Flyover 6. Drainage	25.44	41.89	5.95	0.06	2.30	3.59	5.88	2.10	0.76	2.85
26	Flyover 7. Retaining Walls and Soundwalls	62.50	84.94	12.27	0.14	4.72	17.70	22.43	4.26	3.74	8.00
27	Flyover 8. Striping, Lighting and Signing	15.50	26.74	3.74	0.04	1.34	0.04	1.38	1.23	0.01	1.23
	SHB SR47 Stock Piles (entire project)	0.00	0.00	0.00	0.00	0.00	25.54	25.54	0.00	5.31	5.31
	Overlapping phases										
	2,4,8,10,11,13,14,16	379	698	91	0.8	35	282	317	32	60	92
	2,4,5,6,8,10,11,13,14,15,16,17	730	1342	176	1.5	70	632	701	63	134	197
	2,4,5,6,8,9,11,12,13,14,15,16,17,18	788	1504	193	1.7	75	671	746	68	142	211
	2,3,4,5,6,7,8,9,11,13,14,15,16,18	831	1553	201	1.7	78	716	795	71	152	223
	2,3,4,6,7,8,9,11,13,14,15,16,18	740	1389	180	1.6	70	608	678	64	129	192
	20	15	28	4	0.03	1.2	31	32	1.1	6.5	7.6
	21,25	67	113	15	0.20	5.3	45	51	4.9	10	14
	22,23,26	143	229	32	0.38	12	64	76	11.1	13	25
	27	15	27	4	0.04	1.3	26	27	1.2	5.3	6.5
	Max. Daily Emissions	**831**	**1553**	**201**	**1.7**	**78**	**716**	**795**	**71**	**152**	**223**

Appendix E:
Table E3. Summary of Daily Emissions (Segmental): by

		Construction Equipment Exhaust (lb/day)						Workers Commute (lb/day)					
	Construction Phases	**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**$PM_{2.5}$ Exhaust**	**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**$PM_{2.5}$ Exhaust**
1	SHB 1: Clearing, Grubbing & Earthwork	5.79	8.08	1.23	0.01	0.53	0.48	1.550	0.161	0.159	0.002	0.014	0.009
2	SHB 2. Shaft and Columns - Drilled Shaft Construction	69.34	153.79	17.68	0.17	6.70	6.12	5.424	0.563	0.556	0.006	0.048	0.030
3	SHB 3. Shaft and Columns - Footing Construction	56.76	114.97	13.69	0.13	5.08	4.61	2.314	0.257	0.256	0.003	0.024	0.015
4	SHB 4. Shaft and Columns - Column Construction	31.04	72.10	8.33	0.08	3.08	2.81	2.712	0.281	0.278	0.003	0.024	0.015
5	SHB 5. Superstructure - Approach Span Erection	85.66	164.03	20.80	0.18	8.41	7.63	5.811	0.603	0.595	0.006	0.052	0.032
6	SHB 6. Superstructure - Main Span Erection	89.52	182.87	22.95	0.19	10.23	9.30	5.811	0.603	0.595	0.006	0.052	0.032
7	SHB 7. Bridge Demolition (including both approaches)	75.58	116.02	17.32	0.13	7.29	6.63	6.199	0.643	0.635	0.007	0.055	0.034
8	SHB 8. Barriers and Joints	4.41	5.57	0.66	0.01	0.22	0.19	2.325	0.241	0.238	0.003	0.021	0.013
9	SHB 9. Stripping, Lighting, and Signing	32.32	91.56	9.83	0.10	3.60	3.30	3.874	0.402	0.397	0.004	0.034	0.022
10	SR-47 1. Site Preparation - Earthwork	71.20	127.97	17.87	0.14	7.47	6.82	5.811	0.603	0.595	0.006	0.052	0.032
11	SR-47 2. Site Preparation - Drilled Shaft Construction	46.72	102.80	11.96	0.11	4.51	4.12	5.424	0.563	0.556	0.006	0.048	0.030
12	SR47 3: Foundation Construction	44.51	98.23	11.47	0.11	4.39	4.01	2.712	0.281	0.278	0.003	0.024	0.015
13	SR47 4: Column Construction	25.08	50.66	6.26	0.05	2.30	2.10	2.712	0.281	0.278	0.003	0.024	0.015
14	SR47 5: Falsework	50.96	100.72	13.58	0.11	6.03	5.53	5.811	0.603	0.595	0.006	0.052	0.032
15	SR47 6: Superstructure - Span Erection	103.51	211.00	27.09	0.22	10.69	9.75	9.686	1.005	0.992	0.011	0.086	0.054
16	SR47 7: Drainage	45.17	80.96	11.42	0.09	4.57	4.17	4.649	0.482	0.476	0.005	0.041	0.026
17	SR47 8: Retaining Walls and Soundwalls	46.74	83.41	11.42	0.09	4.78	4.36	4.262	0.442	0.437	0.005	0.038	0.024
18	SR47 9: Striping, Lighting and Signing	47.64	99.11	12.73	0.11	5.16	4.76	4.649	0.482	0.476	0.005	0.041	0.000
20	Flyover 1. Site Preparation - Earthwork	9.75	17.96	2.43	0.03	0.78	0.71	1.585	0.157	0.169	0.003	0.022	0.014
21	Flyover 2. Drilled Shaft Construction	41.01	72.72	9.24	0.12	3.16	2.87	2.641	0.262	0.281	0.004	0.037	0.024
22	Flyover 3. Column Construction	24.75	44.83	5.97	0.07	2.17	1.97	2.641	0.262	0.281	0.004	0.037	0.024
23	Flyover 4. Falsework	56.69	102.53	13.83	0.15	5.59	5.13	2.641	0.262	0.281	0.004	0.037	0.024
24	Flyover 5. superstructure - Span Erection	69.19	117.62	15.80	0.18	6.24	5.66	3.170	0.314	0.337	0.005	0.044	0.029
25	Flyover 6. Drainage	24.12	41.76	5.81	0.06	2.28	2.08	1.321	0.131	0.140	0.002	0.018	0.012
26	Flyover 7. Retaining Walls and Soundwalls	59.33	84.62	11.93	0.14	4.68	4.23	3.170	0.314	0.337	0.005	0.044	0.029
27	Flyover 8. Striping, Lighting and Signing	13.92	26.58	3.58	0.04	1.32	1.21	1.585	0.157	0.169	0.003	0.022	0.014
	SHB SR47 Stock Piles (entire project)	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000
	Overlapping phases												
	2,4,8,10,11,13,14,16	344	695	88	0.7	35	32	35	3.6	3.57	0.0	0.31	0.19
	2,4,5,6,8,10,11,13,14,15,16,17	669	1336	170	1.4	69	63	60	6.3	6.19	0.07	0.54	0.34
	2,4,5,6,8,9,11,12,13,14,15,16,17,18	723	1497	186	1.6	75	68	66	6.8	6.75	0.073	0.58	0.34
	2,3,4,5,6,7,8,9,11,13,14,15,16,18	764	1546	194	1.7	78	71	67	7.0	6.93	0.075	0.60	0.35
	2,3,4,6,7,8,9,11,13,14,15,16,18	678	1382	173	1.5	69	63	62	6.4	6.33	0.07	0.55	0.32
	20	12	27	3.3	0.03	1.2	1.1	2.6	0.3	0.3	0.002	0.02	0.02
	21,25	63	113	15	0.19	5.2	4.8	4.3	0.4	0.5	0.005	0.05	0.05
	22,23,26	134	228	31	0.36	12	11	9.2	0.9	1.0	0.012	0.11	0.10
	27	14	26	3.6	0.04	1.3	1.2	1.7	0.2	0.2	0.002	0.02	0.02
	Max. Daily Emissions	**764**	**1546**	**194**	**1.7**	**78**	**71**	**67**	**7.0**	**6.9**	**0.07**	**0.6**	**0.4**

Appendix E:

Table E4: Construction Equipment Usage (Segmental) - Alternative 1

Schuyler Heim Bridge (SHB)

SHB 1: Clearing, Grubbing & Earthwork

Construction duration from 1/11/2009 to 2/11/2009 This work will occur in stages as work areas become available.

Number of construction Workers 4 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe/excavator	NA	1	1	20	8	160	8	NA	NA	NA	NA
Pick Up	NA	1	1	20	4	80	NA	60	1	5	55
Haul Truck	NA	1	1	20	4	80	NA	50	2	4	46
Worker commute	NA	4	NA	NA	NA	NA	NA	40	1	0	40

SHB 2. Shaft and Columns - Drilled Shaft Construction

Construction duration from 2/1/2009 to 2/1/2011

Number of construction Workers 14 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**CIDH**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per CIDH**	**per CIDH**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
200 ton crane	NA	2	87	10	80	13920	8	NA	NA	NA	NA
Caisson Drill	NA	1	87	4	32	2784	8	NA	NA	NA	NA
200 ton gantry	NA	2	87	7	56	9744	8	NA	NA	NA	NA
Generator	NA	2	87	10	80	13920	8	NA	NA	NA	NA
Flatbed	NA	2	87	8	64	11136	NA	50	1.5	6	44
Pick Up	NA	4	87	10	80	27840	NA	50	1.5	10	40
Concrete Truck	NA	10	87	3	24	20880	NA	32	2	2	30
Concrete Pump Truck	NA	2	87	3	24	4176	8	NA	NA	NA	NA
Compressor	NA	2	87	10	80	13920	8	NA	NA	NA	NA
Water Truck	NA	1	87	4	32	2784	8	NA	NA	NA	NA
Worker commute	NA	14	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	3848	40	ft^3	290
Soil loading	3	0.5	yd^3	7.0

Appendix E:

Table E4: Construction Equipment Usage (Segmental) - Alternative 1 (continued)

SHB 3. Shaft and Columns - Footing Construction

Construction duration from 1/1/2010 to 9/30/1900

Number of construction Workers 7 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Embank. Wall**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per Wall**	**per Wall**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe/excavator	NA	2	2	5	40	160	8	NA	NA	NA	NA
200 ton crane	NA	1	2	2	16	32	8	NA	NA	NA	NA
Generator	NA	1	2	10	80	160	8	NA	NA	NA	NA
Haul Truck	NA	4	2	5	40	320	NA	50	2	4	46
Pick Up	NA	2	2	10	80	320	NA	50	1.5	10	40
Concrete Truck	NA	12	2	3	24	576	NA	32	2	2	30
Concrete Pump Truck	NA	2	2	3	24	96	8	NA	NA	NA	NA
Compressor	NA	1	2	10	80	160	8	NA	NA	NA	NA
Water Truck	NA	1	2	4	32	64	8	NA	NA	NA	NA
Worker commute	NA	7	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	2400	86	ft^3	28
Soil loading	22	3	yd^3	7

SHB 4. Shaft and Columns - Column Construction

Construction duration from 2/20/2009 to 6/11/1901

Number of construction Workers 7 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Columns**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per Col.**	**per Col.**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
140 ton crane	NA	1	87	1	8	696	8	NA	NA	NA	NA
Generator	NA	1	87	4	32	2784	8	NA	NA	NA	NA
Flatbed	NA	1	87	2.5	20	1740	NA	50	1.5	6	44
Pick Up	NA	2	87	4	32	5568	NA	50	1.5	10	40
Concrete Truck	NA	4	87	2	16	5568	NA	32	2	2	30
Concrete Pump Truck	NA	2	87	2	16	2784	8	NA	NA	NA	NA
Compressor	NA	1	87	4	32	2784	8	NA	NA	NA	NA
Worker commute	NA	7	NA	NA	NA	NA	NA	40	1	0	40

Appendix E:

Table E4: Construction Equipment Usage (Segmental) - Alternative 1 (continued)

SHB 5. superstructure - Approach Span Erection

Construction duration from 7/1/2009 to 7/30/2010

Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
275 ton crane	NA	1	18	360	2880	2880	8	NA	NA	NA	NA
Rough Terrain (f-lift)	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
200 ton gantry	NA	1	20	400	3200	3200	8	NA	NA	NA	NA
Generator	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
Semi Truck	NA	10	10	200	1600	16000	NA	42	1	2	40
Flatbed	NA	6	12	240	1920	11520	NA	50	1.5	6	44
Pick Up	NA	10	20	400	3200	32000	NA	50	1.5	10	40
Concrete Truck	NA	10	10	200	1600	16000	NA	32	2	2	30
Concrete Pump Truck	NA	2	10	200	1600	3200	8	NA	NA	NA	NA
Compressor	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40
	Total Amount	**Daily Amount**	**Unit**	**duration**							
Excavation	127340	2122	ft^3	60							
Grading	2	0.1	acre	20							
Soil loading	1572	79	yd^3	20							

SHB 6. superstructure - Main Span Erection

Construction duration from 7/1/2009 to 7/30/2011

Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
400 ton crane	NA	2	10	200	1600	3200	8	NA	NA	NA	NA
Rough Terrain (f-lift)	NA	4	10	200	1600	6400	8	NA	NA	NA	NA
200 ton gantry	NA	2	14	280	2240	4480	8	NA	NA	NA	NA
Generator	NA	3	20	400	3200	9600	8	NA	NA	NA	NA
Semi Truck	NA	20	10	200	1600	32000	NA	42	1	2	40
Flatbed	NA	6	18	360	2880	17280	NA	50	1.5	6	44
Pick Up	NA	10	18	360	2880	28800	NA	50	1.5	10	40
Concrete Truck	NA	1	5	50	400	400	NA	32	2	2	30
Concrete Pump Truck	NA	1	5	50	400	400	8	NA	NA	NA	NA
Compressor	NA	3	20	400	3200	9600	8	NA	NA	NA	NA
Loader	NA	2	1	20	160	320	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40
	Total Amount	**Daily Amount**	**Unit**	**duration**							
Excavation	11550	192.5	ft^3	60							
Grading	1.5	0.1	acre	30							
Soil loading	42.8	2	yd^3	20							

Appendix E:

SHB 7. Bridge Demolition (including both approaches)

Construction duration from 11/1/2009 to 3/30/2011

Number of construction Workers 16 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Pick Up	NA	6	6	120	3	2160	NA	50	1.5	10	40
Haul Truck	NA	10	6	120	4	4800	NA	50	2	4	46
Compressor	NA	4	6	120	8	3840	8	NA	NA	NA	NA
Generator	NA	4	6	120	6	2880	8	NA	NA	NA	NA
Flatbed	NA	4	6	120	3	1440	NA	50	1.5	6	44
Backhoe/excavator	NA	4	6	120	8	3840	8	NA	NA	NA	NA
Loader	NA	3	6	120	4	1440	8	NA	NA	NA	NA
Worker commute	NA	16	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Demolition	62500	391	ft^3	160
Excavation	40300	672	ft^4	60
Grading	2	0.1	acre	20
Soil loading	299	15	yd^3	20

Appendix E:

Table E4: Construction Equipment Usage (Segmental) - Alternative 1 (continued)

SHB 8. Barriers and Joints

Construction duration from 2/1/2009 to 7/30/2011

Number of construction Workers 6 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Pick Up	NA	1	6	120	480	480	NA	50	1	6	44
Concrete Trucks	NA	2	6	120	960	1920	NA	32	2	2	30
Flatbed Truck	NA	1	6	120	480	480	NA	40	1	4	36
Semi Truck	NA	1	6	120	480	480	NA	42	1	2	40
Worker commute	NA	6	NA	NA	NA	NA	NA	40	1	0	40

SHB 9. Stripping, Lighting, and Signing

Construction duration from 9/1/2009 to 8/30/2011

Number of construction Workers 10 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Pick Up	NA	4	2	40	3	480	NA	50	1.5	10	40
Paint truck	NA	1	1.5	30	7	210	8	NA	NA	NA	NA
Compressor	NA	1	1.5	30	7	210	8	NA	NA	NA	NA
Bucket Truck	NA	2	2	40	5	400	8	NA	NA	NA	NA
Semi Truck	NA	2	0.5	10	4	80	NA	42	1	2	40
Boom Truck	NA	1	0.5	10	6	60	8	NA	NA	NA	NA
Worker commute	NA	10	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
excavation	11781	589	ft^3	20

Appendix E:

Table E4: Construction Equipment Usage (Segmental) - Alternative 1 (continued)

SR-47 Truck Expressway

SR-47 1. Site Preparation - Earthwork

Construction duration from 2/1/2009 to 9/1/2009

Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Loader	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Haulers (Truck)	NA	6	4	80	640	3840	NA	50	2	4	46
Generator	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Flatbed	NA	2	6	120	960	1920	NA	50	1.5	6	44
Pick Up	NA	6	6	120	960	5760	NA	50	1.5	10	40
Grader	NA	2	3	60	480	960	8	NA	NA	NA	NA
Vibratory loader	NA	2	3	60	480	960	8	NA	NA	NA	NA
Asphalt Paver	NA	1	2	40	320	320	8	NA	NA	NA	NA
Compressor	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Water Truck	NA	1	5	100	800	800	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

SR-47 2. Site Preparation - Drilled Shaft Construction

Construction duration from 3/1/2009 to 2/1/2011

Number of construction Workers 14 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**CIDH**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per CIDH**	**per CIDH**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
200 ton crane	NA	1	120	10	80	9600	8	NA	NA	NA	NA
Caisson Drill	NA	1	120	4	32	3840	8	NA	NA	NA	NA
140 ton crane	NA	1	120	7	56	6720	8	NA	NA	NA	NA
Generator	NA	2	120	10	80	19200	8	NA	NA	NA	NA
Flatbed	NA	2	120	10	80	19200	NA	50	1.5	6	44
Pick Up	NA	4	120	10	80	38400	NA	50	1.5	10	40
Concrete Truck	NA	5	120	2	16	9600	NA	32	2	2	30
Concrete Pump Truck	NA	1	120	2	16	1920	8	NA	NA	NA	NA
Compressor	NA	1	120	1	8	960	8	NA	NA	NA	NA
Water Truck	NA	1	120	4	32	3840	8	NA	NA	NA	NA
Worker commute	NA	14	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Demolition	13572	226	ft^3	60
Excavation	16286	271	ft^3	60
Grading	2	0.1	acre	20
Soil Loading	42	2	yd^3	20

Appendix E:

Table E4: Construction Equipment Usage (Segmental) - Alternative 1 (continued)

SR47 3: Foundation Construction

Construction duration from 10/1/2009 to 11/1/2009
Number of construction Workers 7 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe/excavator	NA	1	1	20	160	160	8	NA	NA	NA	NA
140 ton crane	NA	1	0.5	10	80	40	8	NA	NA	NA	NA
Generator	NA	1	1	20	160	160	8	NA	NA	NA	NA
Haul Truck	NA	4	0.5	10	80	160	NA	50	2	4	46
Pick Up	NA	3	1	20	160	480	NA	50	1.5	10	40
Concrete Truck	NA	1	0.25	5	40	10	NA	32	2	2	30
Concrete Pump Truck	NA	1	0.25	5	40	10	8	NA	NA	NA	NA
Compressor	NA	1	0.5	10	80	40	8	NA	NA	NA	NA
Water Truck	NA	1	0.5	10	80	40	8	NA	NA	NA	NA
Pile Driver	NA	2	1	20	160	320	8	NA	NA	NA	NA
Worker commute	NA	7	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	408	81.6	ft^3	5
Soil Loading	3.0	0.6	yd^3	5

SR47 4: Column Construction

Construction duration from 2/20/2009 to 4/1/2011
Number of construction Workers 7 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Columns**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per Col.**	**per Col.**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
140 ton crane	NA	1	120	1	8	960	8	NA	NA	NA	NA
Generator	NA	1	120	4	32	3840	8	NA	NA	NA	NA
Flatbed	NA	2	120	2	16	3840	NA	50	1.5	6	44
Pick Up	NA	4	120	4	32	15360	NA	50	1.5	10	40
Concrete Truck	NA	2	120	1	8	1920	NA	32	2	2	30
Concrete Pump Truck	NA	1	120	1	8	960	8	NA	NA	NA	NA
Compressor	NA	1	120	4	32	3840	8	NA	NA	NA	NA
Worker commute	NA	7	NA	NA	NA	NA	NA	40	1	0	40

Appendix E:

Table E4: Construction Equipment Usage (Segmental) - Alternative 1 (continued)

SR47 5: Falsework

Construction duration from 3/1/2009 to 7/30/2011
Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
100 ton crane	NA	1	30	600	4800	4800	8	NA	NA	NA	NA
Generator	NA	2	30	600	4800	9600	8	NA	NA	NA	NA
Flatbed	NA	2	30	600	4800	9600	NA	50	1.5	6	44
Pick Up	NA	4	30	600	4800	19200	NA	50	1.5	10	40
Rough Terrain (f - lift)	NA	4	30	600	4800	19200	8	NA	NA	NA	NA
Scissor Lift	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
Compressor	NA	2	30	600	4800	9600	8	NA	NA	NA	NA
Boom	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

SR47 6: Superstructure - Span Erection

Construction duration from 7/1/2009 to 7/30/2011
Number of construction Workers 25 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
275 ton crane	NA	1	18	360	2880	2880	8	NA	NA	NA	NA
Rough Terrain (f-lift)	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
140 ton crane	NA	1	20	400	3200	3200	8	NA	NA	NA	NA
Generator	NA	4	18	360	2880	11520	8	NA	NA	NA	NA
Semi Truck	NA	4	16	320	2560	10240	NA	42	1	2	40
Flatbed	NA	4	20	400	3200	12800	NA	50	1.5	6	44
Pick Up	NA	10	20	400	3200	32000	NA	50	1.5	10	40
Concrete Truck	NA	12	9	180	1440	17280	NA	32	2	2	30
Concrete Pump Truck	NA	4	9	180	1440	5760	8	NA	NA	NA	NA
Compressor	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
Worker commute	NA	25	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Demolition	120000	12000	ft^3	10
Excavation	12000	1200	ft^3	10
grading	1.5	0.3	acre	5
paving	1.5	0.15	acre	10

Appendix E:

Table E4: Construction Equipment Usage (Segmental) - Alternative 1 (continued)

SR47 7: Drainage

Construction duration from 3/1/2009 to 3/1/2011

Number of construction Workers 12 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe	NA	1	6	120	960	960	8	NA	NA	NA	NA
Loader	NA	1	6	120	960	960	8	NA	NA	NA	NA
Haulers (Truck)	NA	2	2	40	320	640	NA	50	2	4	46
Generator	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Flatbed	NA	4	6	120	960	3840	NA	50	1.5	6	44
Pick Up	NA	4	6	120	960	3840	NA	50	1.5	10	40
Vibratory Roller	NA	2	3	60	480	960	8	NA	NA	NA	NA
Compressor	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Water Truck	NA	1	3	60	480	480	8	NA	NA	NA	NA
Concrete Truck	NA	1	1	20	160	160	NA	32	2	2	30
Worker commute	NA	12	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Demolition	105600	660	ft^3	160
Excavation	73920	616	ft^4	120
grading	2	0.10	acre	20
Paving	2	0.07	acre	30
Soil dumping	10	0.5	yd^3	60

SR47 8: Retaining Walls and Soundwalls

Construction duration from 7/1/2009 to 12/30/2009

Number of construction Workers 11 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Loader	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Haulers (Truck)	NA	4	5	100	800	3200	NA	50	2	4	46
Generator	NA	1	6	120	960	960	8	NA	NA	NA	NA
Flatbed	NA	2	4	80	640	1280	NA	50	1.5	6	44
Pick Up	NA	2	6	120	960	1920	NA	50	1.5	10	40
Vibratory Roller	NA	2	3	60	480	960	8	NA	NA	NA	NA
Compressor	NA	1	6	120	960	960	8	NA	NA	NA	NA
Water Truck	NA	1	4	80	640	640	8	NA	NA	NA	NA
Concrete Truck	NA	2	1	20	160	320	NA	32	2	2	30
Worker commute	NA	11	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	100000	2500	ft^3	40
Grading	2	0.2	acre	10
Soil Loading	231	23	yd^3	10

Appendix E:

Table E4: Construction Equipment Usage (Segmental) - Alternative 1 (continued)

SR47 9: Striping, Lighting and Signing

Construction duration from 9/1/2009 to 12/30/2009

Number of construction Workers 12 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Boom	NA	4	4	80	640	2560	8	NA	NA	NA	NA
Loader	NA	1	2	40	320	320	8	NA	NA	NA	NA
Generator	NA	3	6	120	960	2880	8	NA	NA	NA	NA
Flatbed	NA	2	6	120	960	1920	NA	50	1.5	6	44
Pick Up	NA	6	6	120	960	5760	NA	50	1.5	10	40
Compressor	NA	3	6	120	960	2880	8	NA	NA	NA	NA
Striper (Truck)	NA	1	4	80	640	640	8	NA	NA	NA	NA
Worker commute	NA	12	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	29452	982	ft^3	30

SHB and SR-47: Stockpile Area

Construction duration from 1/11/2009 to 8/30/2011

	Maximum Area Covered	**Unit**
Stock Piles	2	acres/day

1. Construction data provided by DMJM Harris, May 2005
2. Stock pile areas were not specified for each construction phases. The maximum areas that might be covered each day by the whole project was used to calculate the total fugitive dust emissions from stock piles.
3. Detailed Flyover construction emission calculations are presented in Appendix A1.

Appendix E:

Table E5: Emission Factors (Segmental) - Alternative 1

SHB 1: Clearing, Grubbing & Earthwork

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe/excavator	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Haul Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211

SHB 2. Shaft and Columns - Drilled Shaft Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
200 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Caisson Drill	Bore/Drill Rigs	2009	lb/hr	0.520	1.229	0.116	0.002	0.054	0.000	0.050	0.000
200 ton gantry	Other Construction Equipment	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.043	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Soil loading	Soil loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

Appendix E:

Table E5: Emission Factors (Segmental) - Alternative 1 (continued)

SHB 3. Shaft and Columns - Footing Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe/excavator	Tractors/Loaders/Backhoes	2010	lb/hr	0.393	0.675	0.102	0.001	0.052	0.000	0.048	0.000
200 ton crane	Cranes	2010	lb/hr	0.543	1.451	0.159	0.001	0.064	0.000	0.059	0.000
Generator	Generator Sets	2010	lb/hr	0.329	0.644	0.096	0.001	0.040	0.000	0.036	0.000
Haul Truck	On-road Delivery	2010	lb/VMT	0.018	0.021	0.003	0.00003	0.00075	0.997	0.001	0.211
Pick Up	On-road passenger	2010	lb/VMT	0.008	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2010	lb/VMT	0.018	0.021	0.003	0.00003	0.00075	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2010	lb/hr	0.743	2.388	0.248	0.003	0.088	0.000	0.081	0.000
Compressor	Air compressor	2010	lb/hr	0.361	0.732	0.112	0.001	0.053	0.000	0.048	0.000
Water Truck	Off-Highway Trucks	2010	lb/hr	0.743	2.388	0.248	0.003	0.088	0.000	0.081	0.000
Worker commute	On-road passenger	2010	lb/VMT	0.008	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2010	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Soil loading	Soil loading	2010	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

SHB 4. Shaft and Columns - Column Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211

Appendix E:

Table E5: Emission Factors (Segmental) - Alternative 1 (continued)

SHB 5. superstructure - Approach Span Erection

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
275 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Rough Terrain (f-lift)	Rough Terrain Forklifts	2009	lb/hr	0.482	0.851	0.137	0.001	0.072	0.000	0.066	0.000
200 ton gantry	Other Construction Equipment	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.043	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.002	1.861	0.002	0.395
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Soil loading	Soil loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

SHB 6. superstructure - Main Span Erection

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
400 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Rough Terrain (f-lift)	Rough Terrain Forklifts	2009	lb/hr	0.482	0.851	0.137	0.001	0.072	0.000	0.066	0.000
200 ton gantry	Other Construction Equipment	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.043	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.002	1.861	0.002	0.395
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Soil loading	Soil loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

Appendix E:

SHB 7. Bridge Demolition (including both approaches)

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Haul Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Backhoe/excavator	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Demolition	Demolition	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Soil loading	Soil loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

Appendix E:

Table E5: Emission Factors (Segmental) - Alternative 1 (continued)

SHB 8. Barriers and Joints

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.9973	0.000	0.211
Concrete Trucks	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.9973	0.001	0.211
Flatbed Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.9973	0.001	0.211
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.002	1.8611	0.002	0.395
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.9973	0.000	0.211

SHB 9. Stripping, Lighting, and Signing

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Paint truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Bucket Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.002	1.861	0.002	0.395
Boom Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000

Appendix E:

Table E5: Emission Factors (Segmental) - Alternative 1 (continued)

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SR-47 1. Site Preparation - Earthwork

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Haulers (Truck)	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Grader	Graders	2009	lb/hr	0.643	1.524	0.183	0.001	0.080	0.000	0.073	0.000
Vibratory loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Asphalt Paver	Pavers	2009	lb/hr	0.576	1.032	0.187	0.001	0.074	0.000	0.068	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211

SR-47 2. Site Preparation - Drilled Shaft Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
200 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Caisson Drill	Bore/Drill Rigs	2009	lb/hr	0.520	1.229	0.116	0.002	0.054	0.000	0.050	0.000
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Demolition	Demolition	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Soil Loading	Soil Loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

Appendix E:

Table E5: Emission Factors (Segmental) - Alternative 1 (continued)

SR47 3: Foundation Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe/excavator	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Haul Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Pile Driver	Other Construction Equipment	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.043	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000054	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Soil Loading	Soil Loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

SR47 4: Column Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211

Appendix E:

Table E5: Emission Factors (Segmental) - Alternative 1 (continued)

SR47 5: Falsework

Emission Factors (see Appendix I for details and reference of emission factors)

Equipment Description	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
0											
100 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Rough Terrain (f - lift)	Rough Terrain Forklifts	2009	lb/hr	0.482	0.851	0.137	0.001	0.072	0.000	0.066	0.000
Scissor Lift	Other Construction Equipment	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.043	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Boom	Other Construction Equipment	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.043	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211

SR47 6: Superstructure - Span Erection

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
275 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Rough Terrain (f-lift)	Rough Terrain Forklifts	2009	lb/hr	0.482	0.851	0.137	0.001	0.072	0.000	0.066	0.000
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.002	1.861	0.002	0.395
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Demolition	Demolition	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
grading	grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
paving	paving	2009	lb ROG / acre	0.000	0.000	2.620	0.000	0.000	0.000	0.000	0.000

Table E5: Emission Factors (Segmental) - Alternative 1 (continued)

SR47 7: Drainage

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Haulers (Truck)	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Vibratory Roller	Rollers	2009	lb/hr	0.427	0.817	0.125	0.001	0.057	0.000	0.053	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Demolition	Demolition	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
grading	grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Paving	Paving	2009	lb ROG / acre	0.000	0.000	2.620	0.000	0.000	0.000	0.000	0.000
Soil dumping	Soil dumping	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.016	0.000	0.003

SR47 8: Retaining Walls and Soundwalls

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Haulers (Truck)	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Vibratory Roller	Rollers	2009	lb/hr	0.427	0.817	0.125	0.001	0.057	0.000	0.053	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.0004	0.000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Soil Loading	Soil Loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

Appendix E:

Table E5: Emission Factors (Segmental) - Alternative 1 (continued)

SR47 9: Striping, Lighting and Signing

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Boom	Other Construction Equipment	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.043	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Striper (Truck)	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

SHB and SR-47: Stockpile Area

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Stock piles	Stock piles	All	lb/acre/day	0.000	0.000	0.000	0.000	0.000	39.908	0.000	8.301

Note:

1. Stock pile areas were not specified or calculated for each construction phases. The maximum areas that might be covered each day by the whole project was used to calculate the total fugitive dust emissions from stock piles.
2. Detailed references of the emission factors are in Appendix I.

Appendix E:

Table E6: Daily Emissions (Segmental) - Alternative 1

SHB 1: Clearing, Grubbing & Earthwork

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
Pick Up	0.581	0.060	0.060	0.001	0.005	4.987	0.003	1.057
Haul Truck	2.016	2.237	0.279	0.003	0.081	3.989	0.069	0.846
Worker commute	1.550	0.161	0.159	0.002	0.014	0.000	0.009	0.000
Total	7.341	8.239	1.384	0.011	0.547	8.976	0.493	1.903

SHB 1: Clearing, Grubbing & Earthwork

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.1943	5.7812	0.8869	0.0062	0.4472	0.0000	0.4114	0.0000
Pick Up	0.5811	0.0603	0.0595	0.0006	0.0052	2.7427	0.0032	0.5814
Haul Truck	2.0161	2.2366	0.2789	0.0027	0.0805	2.1941	0.0692	0.4652
Worker commute	1.5497	0.1608	0.1588	0.0017	0.0138	0.0000	0.0086	0.0000
Total	7.3412	8.2390	1.3841	0.0112	0.5467	4.9368	0.4925	1.0466

0

SHB 2. Shaft and Columns - Drilled Shaft Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
200 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.998	0.000
Caisson Drill	4.160	9.830	0.929	0.014	0.432	0.000	0.398	0.000
200 ton gantry	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Concrete Truck	12.903	14.314	1.785	0.017	0.516	19.947	0.443	4.229
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.000	0.030	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.017	0.000	0.003
Soil loading	0.000	0.000	0.000	0.000	0.000	0.020	0.000	0.004
Total	74.768	154.356	18.239	0.173	6.747	71.844	6.147	15.231

0

SHB 2. Shaft and Columns - Drilled Shaft Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
200 ton crane	9.128	24.470	2.693	0.022	1.085	0.0000	0.9980	0.0000
Caisson Drill	4.160	9.830	0.929	0.014	0.432	0.0000	0.3979	0.0000
200 ton gantry	6.866	17.299	1.808	0.020	0.753	0.0000	0.6932	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.0000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.5824	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.9413	0.0162	4.6516
Concrete Truck	12.903	14.314	1.785	0.017	0.516	10.9707	0.4431	2.3258
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.0000	1.3674	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.0000	0.8045	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.0000	0.6837	0.0000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.0000	0.0302	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.0054	0.0000	0.0011
Soil loading	0.000	0.000	0.000	0.000	0.000	0.0062	0.0000	0.0013
Total	74.768	154.356	18.239	0.173	6.747	39.506	6.147	8.375

Appendix E:

Table E6: Daily Emissions (Segmental) - Alternative 1 (continued)

SHB 3. Shaft and Columns - Footing Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	6.287	10.796	1.633	0.012	0.833	0.000	0.766	0.000
200 ton crane	4.345	11.612	1.275	0.011	0.514	0.000	0.473	0.000
Generator	2.634	5.152	0.769	0.006	0.317	0.000	0.292	0.000
Haul Truck	7.375	8.250	1.036	0.011	0.300	15.957	0.257	3.383
Pick Up	1.239	0.138	0.137	0.002	0.013	19.947	0.008	4.229
Concrete Truck	14.160	15.840	1.989	0.021	0.577	23.936	0.493	5.074
Concrete Pump Truck	11.886	38.216	3.968	0.043	1.400	0.000	1.288	0.000
Compressor	2.890	5.856	0.896	0.006	0.421	0.000	0.387	0.000
Water Truck	5.943	19.108	1.984	0.021	0.700	0.000	0.644	0.000
Worker commute	2.314	0.257	0.256	0.003	0.024	0.000	0.015	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.036	0.000	0.007
Soil loading	0.000	0.000	0.000	0.000	0.000	0.126	0.000	0.026
Total	59.074	115.225	13.943	0.135	5.100	60.002	4.624	12.720

SHB 3. Shaft and Columns - Footing Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	6.287	10.796	1.633	0.012	0.833	0.0000	0.7662	0.0000
200 ton crane	4.345	11.612	1.275	0.011	0.514	0.0000	0.4726	0.0000
Generator	2.634	5.152	0.769	0.006	0.317	0.0000	0.2917	0.0000
Haul Truck	7.375	8.250	1.036	0.011	0.300	8.7765	0.2569	1.8606
Pick Up	1.239	0.138	0.137	0.002	0.013	10.9707	0.0082	2.3258
Concrete Truck	14.160	15.840	1.989	0.021	0.577	13.1648	0.4933	2.7909
Concrete Pump Truck	11.886	38.216	3.968	0.043	1.400	0.0000	1.2881	0.0000
Compressor	2.890	5.856	0.896	0.006	0.421	0.0000	0.3874	0.0000
Water Truck	5.943	19.108	1.984	0.021	0.700	0.0000	0.6441	0.0000
Worker commute	2.314	0.257	0.256	0.003	0.024	0.0000	0.0153	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.0115	0.0000	0.0024
Soil loading	0.000	0.000	0.000	0.000	0.000	0.0403	0.0000	0.0084
Total	59.074	115.225	13.943	0.135	5.100	32.964	4.624	6.988

SHB 4. Shaft and Columns - Column Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.305	0.000
Flatbed	1.512	1.677	0.209	0.002	0.060	5.984	0.052	1.269
Pick Up	1.453	0.151	0.149	0.002	0.013	19.947	0.008	4.229
Concrete Truck	5.161	5.726	0.714	0.007	0.206	7.979	0.177	1.691
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.015	0.000
Total	33.753	72.384	8.611	0.078	3.101	33.909	2.826	7.189

SHB 4. Shaft and Columns - Column Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.3046	0.0000
Flatbed	1.512	1.677	0.209	0.002	0.060	3.291	0.0519	0.6977
Pick Up	1.453	0.151	0.149	0.002	0.013	10.971	0.0081	2.3258
Concrete Truck	5.161	5.726	0.714	0.007	0.206	4.388	0.1772	0.9303
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.3674	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.4022	0.0000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.0151	0.0000
Total	33.753	72.384	8.611	0.078	3.101	18.650	2.826	3.954

Appendix E:

Table E6: Daily Emissions (Segmental) - Alternative 1 (continued)

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SHB 5. superstructure - Approach Span Erection

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Rough Terrain (f-lift)	7.704	13.608	2.188	0.013	1.150	0.000	1.058	0.000
200 ton gantry	3.433	8.650	0.904	0.010	0.377	0.000	0.347	0.000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.219	0.000
Semi Truck	5.385	17.575	1.383	0.017	0.838	37.222	0.736	7.891
Flatbed	9.072	10.065	1.255	0.012	0.362	35.904	0.312	7.612
Pick Up	7.264	0.754	0.744	0.008	0.065	99.733	0.040	21.143
Concrete Truck	12.903	14.314	1.785	0.017	0.516	19.947	0.443	4.229
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.609	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.891	0.000	0.185
Grading	0.000	0.000	0.000	0.000	0.000	2.640	0.000	0.549
Soil loading	0.000	0.000	0.000	0.000	0.000	3.120	0.000	0.649
Total	91.475	164.635	21.396	0.182	8.461	199.457	7.661	42.258

SHB 5. superstructure - Approach Span Erection

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Rough Terrain (f-lift)	7.704	13.608	2.188	0.013	1.150	0.000	1.0576	0.0000
200 ton gantry	3.433	8.650	0.904	0.010	0.377	0.000	0.3466	0.0000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.2185	0.0000
Semi Truck	5.385	17.575	1.383	0.017	0.838	20.472	0.7360	4.3401
Flatbed	9.072	10.065	1.255	0.012	0.362	19.747	0.3115	4.1864
Pick Up	7.264	0.754	0.744	0.008	0.065	54.853	0.0404	11.6289
Concrete Truck	12.903	14.314	1.785	0.017	0.516	10.971	0.4431	2.3258
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.3674	0.0000
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.6090	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.0323	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.285	0.0000	0.0593
Grading	0.000	0.000	0.000	0.000	0.000	0.845	0.0000	0.1757
Soil loading	0.000	0.000	0.000	0.000	0.000	0.998	0.0000	0.2077
Total	91.475	164.635	21.396	0.182	8.461	108.172	7.661	22.924

SHB 6. superstructure - Main Span Erection

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
400 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.998	0.000
Rough Terrain (f-lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.115	0.000
200 ton gantry	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Generator	8.108	16.124	2.448	0.017	0.993	0.000	0.914	0.000
Semi Truck	10.771	35.151	2.766	0.034	1.676	74.444	1.472	15.782
Flatbed	9.072	10.065	1.255	0.012	0.362	35.904	0.312	7.612
Pick Up	7.264	0.754	0.744	0.008	0.065	99.733	0.040	21.143
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.995	0.044	0.423
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	8.878	18.393	2.831	0.017	1.312	0.000	1.207	0.000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.081	0.000	0.017
Grading	0.000	0.000	0.000	0.000	0.000	1.320	0.000	0.275
Soil loading	0.000	0.000	0.000	0.000	0.000	0.085	0.000	0.018
Total	95.331	183.473	23.548	0.198	10.287	213.561	9.334	45.269

SHB 6. superstructure - Main Span Erection

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
400 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.9980	0.0000
Rough Terrain (f-lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.1153	0.0000
200 ton gantry	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Generator	8.108	16.124	2.448	0.017	0.993	0.000	0.9139	0.0000
Semi Truck	10.771	35.151	2.766	0.034	1.676	40.944	1.4719	8.6801
Flatbed	9.072	10.065	1.255	0.012	0.362	19.747	0.3115	4.1864
Pick Up	7.264	0.754	0.744	0.008	0.065	54.853	0.0404	11.6289
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.097	0.0443	0.2326
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	8.878	18.393	2.831	0.017	1.312	0.000	1.2067	0.0000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.0323	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.026	0.0000	0.0054
Grading	0.000	0.000	0.000	0.000	0.000	0.422	0.0000	0.0879
Soil loading	0.000	0.000	0.000	0.000	0.000	0.027	0.0000	0.0057
Total	95.331	183.473	23.548	0.198	10.287	117.117	9.334	24.827

Appendix E:

SHB 7. Bridge Demolition (including both approaches)

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	4.359	0.452	0.447	0.005	0.039	59.840	0.024	12.686
Haul Truck	20.161	22.366	2.789	0.027	0.805	39.893	0.692	8.457
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.609	0.000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.219	0.000
Flatbed	6.048	6.710	0.837	0.008	0.242	23.936	0.208	5.074
Backhoe/excavator	12.777	23.125	3.547	0.025	1.789	0.000	1.646	0.000
Loader	9.583	17.344	2.661	0.019	1.342	0.000	1.234	0.000
Worker commute	6.199	0.643	0.635	0.007	0.055	0.000	0.034	0.000
Demolition	0.000	0.000	0.000	0.000	0.000	0.164	0.000	0.034
Excavation	0.000	0.000	0.000	0.000	0.000	0.282	0.000	0.059
Grading	0.000	0.000	0.000	0.000	0.000	2.640	0.000	0.549
Soil loading	0.000	0.000	0.000	0.000	0.000	0.592	0.000	0.123
Total	81.775	116.663	17.954	0.135	7.345	127.348	6.666	26.983

SHB 7. Bridge Demolition (including both approaches)

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	4.359	0.452	0.447	0.005	0.039	32.912	0.0242	6.9773
Haul Truck	20.161	22.366	2.789	0.027	0.805	21.941	0.6923	4.6516
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.6090	0.0000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.2185	0.0000
Flatbed	6.048	6.710	0.837	0.008	0.242	13.165	0.2077	2.7909
Backhoe/excavator	12.777	23.125	3.547	0.025	1.789	0.000	1.6457	0.0000
Loader	9.583	17.344	2.661	0.019	1.342	0.000	1.2343	0.0000
Worker commute	6.199	0.643	0.635	0.007	0.055	0.000	0.0345	0.0000
Demolition	0.000	0.000	0.000	0.000	0.000	0.053	0.0000	0.0109
Excavation	0.000	0.000	0.000	0.000	0.000	0.090	0.0000	0.0188
Grading	0.000	0.000	0.000	0.000	0.000	0.845	0.0000	0.1757
Soil loading	0.000	0.000	0.000	0.000	0.000	0.190	0.0000	0.0394
Total	81.775	116.663	17.954	0.135	7.345	69.195	6.666	14.665

SHB 8. Barriers and Joints

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	0.484	0.050	0.050	0.001	0.004	5.984	0.003	1.269
Concrete Trucks	2.581	2.863	0.357	0.003	0.103	3.989	0.089	0.846
Flatbed Truck	0.806	0.895	0.112	0.001	0.032	3.989	0.028	0.846
Semi Truck	0.539	1.758	0.138	0.002	0.084	3.722	0.074	0.789
Worker commute	2.325	0.241	0.238	0.003	0.021	0.000	0.013	0.000
Total	6.734	5.807	0.895	0.009	0.244	17.685	0.206	3.749

SHB 8. Barriers and Joints

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	0.484	0.050	0.050	0.001	0.004	3.291	0.0027	0.6977
Concrete Trucks	2.581	2.863	0.357	0.003	0.103	2.194	0.0886	0.4652
Flatbed Truck	0.806	0.895	0.112	0.001	0.032	2.194	0.0277	0.4652
Semi Truck	0.539	1.758	0.138	0.002	0.084	2.047	0.0736	0.4340
Worker commute	2.325	0.241	0.238	0.003	0.021	0.000	0.0129	0.0000
Total	6.734	5.807	0.895	0.009	0.244	9.727	0.206	2.062

SHB 9. Stripping, Lighting, and Signing

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Paint truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Bucket Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Semi Truck	1.077	3.515	0.277	0.003	0.168	7.444	0.147	1.578
Boom Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	3.874	0.402	0.397	0.004	0.034	0.000	0.022	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.247	0.000	0.051
Total	36.194	91.966	10.225	0.102	3.638	47.585	3.322	10.087

SHB 9. Stripping, Lighting, and Signing

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Paint truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.4022	0.0000
Bucket Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.3674	0.0000
Semi Truck	1.077	3.515	0.277	0.003	0.168	4.094	0.1472	0.8680
Boom Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Worker commute	3.874	0.402	0.397	0.004	0.034	0.000	0.0215	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.079	0.0000	0.0165
Total	36.194	91.966	10.225	0.102	3.638	26.115	3.322	5.536

Appendix E:

Table E6: Daily Emissions (Segmental) - Alternative 1 (continued)

SR-47 1. Site Preparation - Earthwork

SR-47 1. Site Preparation - Earthwork

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Haulers (Truck)	12.096	13.420	1.673	0.016	0.483	23.936	0.415	5.074
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	4.359	0.452	0.447	0.005	0.039	59.840	0.024	12.686
Grader	10.285	24.380	2.920	0.024	1.273	0.000	1.171	0.000
Vibratory loader	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Asphalt Paver	4.605	8.257	1.494	0.007	0.591	0.000	0.544	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Total	77.015	128.570	18.466	0.143	7.522	95.744	6.857	20.298

SR-47 1. Site Preparation - Earthwork

SR-47 1. Site Preparation - Earthwork

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Haulers (Truck)	12.096	13.420	1.673	0.016	0.483	13.165	0.4154	2.7909
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	4.359	0.452	0.447	0.005	0.039	32.912	0.0242	6.9773
Grader	10.285	24.380	2.920	0.024	1.273	0.000	1.1714	0.0000
Vibratory loader	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Asphalt Paver	4.605	8.257	1.494	0.007	0.591	0.000	0.5437	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.8045	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.0323	0.0000
Total	77.015	128.570	18.466	0.143	7.522	52.659	6.857	11.164

SR-47 2. Site Preparation - Drilled Shaft Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
200 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Caisson Drill	4.160	9.830	0.929	0.014	0.432	0.000	0.398	0.000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Concrete Truck	6.451	7.157	0.892	0.009	0.258	9.973	0.222	2.114
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.000	0.030	0.000
Demolition	0.000	0.000	0.000	0.000	0.000	0.095	0.000	0.020
Excavation	0.000	0.000	0.000	0.000	0.000	0.114	0.000	0.024
Grading	0.000	0.000	0.000	0.000	0.000	2.640	0.000	0.549
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.083	0.000	0.017
Total	52.147	103.364	12.517	0.117	4.556	64.767	4.146	13.719

SR-47 2. Site Preparation - Drilled Shaft Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
200 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Caisson Drill	4.160	9.830	0.929	0.014	0.432	0.000	0.3979	0.0000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Concrete Truck	6.451	7.157	0.892	0.009	0.258	5.485	0.2215	1.1629
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.4022	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.000	0.0302	0.0000
Demolition	0.000	0.000	0.000	0.000	0.000	0.030	0.0000	0.0063
Excavation	0.000	0.000	0.000	0.000	0.000	0.036	0.0000	0.0076
Grading	0.000	0.000	0.000	0.000	0.000	0.845	0.0000	0.1757
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.027	0.0000	0.0055
Total	52.147	103.364	12.517	0.117	4.556	34.947	4.146	7.405

Appendix E:

Table E6: Daily Emissions (Segmental) - Alternative 1 (continued)

SR47 3: Foundation Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.305	0.000
Haul Truck	8.064	8.947	1.116	0.011	0.322	15.957	0.277	3.383
Pick Up	2.179	0.226	0.223	0.002	0.019	29.920	0.012	6.343
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.995	0.044	0.423
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Pile Driver	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.015	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.034	0.000	0.007
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.024	0.000	0.005
Total	47.221	98.515	11.752	0.109	4.415	47.930	4.026	10.161

SR47 3: Foundation Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.194	5.781	0.887	0.006	0.447	0.000	0.4114	0.0000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.3046	0.0000
Haul Truck	8.064	8.947	1.116	0.011	0.322	8.777	0.2769	1.8606
Pick Up	2.179	0.226	0.223	0.002	0.019	16.456	0.0121	3.4887
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.097	0.0443	0.2326
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.4022	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Pile Driver	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.0151	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.011	0.0000	0.0023
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.008	0.0000	0.0016
Total	47.221	98.515	11.752	0.109	4.415	26.348	4.026	5.586

SR47 4: Column Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.305	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Concrete Truck	2.581	2.863	0.357	0.003	0.103	3.989	0.089	0.846
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.015	0.000
Total	27.793	50.945	6.535	0.057	2.328	55.851	2.113	11.840

SR47 4: Column Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.3046	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Concrete Truck	2.581	2.863	0.357	0.003	0.103	2.194	0.0886	0.4652
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.4022	0.0000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.0151	0.0000
Total	27.793	50.945	6.535	0.057	2.328	30.718	2.113	6.512

Appendix E:

Table E6: Daily Emissions (Segmental) - Alternative 1 (continued)

SR47 5: Falsework

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
100 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Rough Terrain (f - lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.115	0.000
Scissor Lift	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Boom	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Total	56.770	101.321	14.171	0.114	6.083	51.861	5.567	10.995

SR47 5: Falsework

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
100 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Rough Terrain (f - lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.1153	0.0000
Scissor Lift	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.8045	0.0000
Boom	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.0323	0.0000
Total	56.770	101.321	14.171	0.114	6.083	28.524	5.567	6.047

SR47 6: Superstructure - Span Erection

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Rough Terrain (f-lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.115	0.000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.219	0.000
Semi Truck	2.154	7.030	0.553	0.007	0.335	14.889	0.294	3.156
Flatbed	6.048	6.710	0.837	0.008	0.242	23.936	0.208	5.074
Pick Up	7.264	0.754	0.744	0.008	0.065	99.733	0.040	21.143
Concrete Truck	15.483	17.177	2.142	0.021	0.619	23.936	0.532	5.074
Concrete Pump Truck	25.378	81.616	8.310	0.085	2.973	0.000	2.735	0.000
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.609	0.000
Worker commute	9.686	1.005	0.992	0.011	0.086	0.000	0.054	0.000
Demolition	0.000	0.000	0.000	0.000	0.000	5.040	0.000	1.048
Excavation	0.000	0.000	0.000	0.000	0.000	0.504	0.000	0.105
grading	0.000	0.000	0.000	0.000	0.000	7.920	0.000	1.647
paving	0.000	0.000	0.393	0.000	0.000	0.000	0.000	0.000
Total	113.198	212.001	28.080	0.232	10.776	175.958	9.804	37.249

SR47 6: Superstructure - Span Erection

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Rough Terrain (f-lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.1153	0.0000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.2185	0.0000
Semi Truck	2.154	7.030	0.553	0.007	0.335	8.189	0.2944	1.7360
Flatbed	6.048	6.710	0.837	0.008	0.242	13.165	0.2077	2.7909
Pick Up	7.264	0.754	0.744	0.008	0.065	54.853	0.0404	11.6289
Concrete Truck	15.483	17.177	2.142	0.021	0.619	13.165	0.5317	2.7909
Concrete Pump Truck	25.378	81.616	8.310	0.085	2.973	0.000	2.7348	0.0000
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.6090	0.0000
Worker commute	9.686	1.005	0.992	0.011	0.086	0.000	0.0538	0.0000
Demolition	0.000	0.000	0.000	0.000	0.000	1.613	0.0000	0.3355
Excavation	0.000	0.000	0.000	0.000	0.000	0.161	0.0000	0.0335
grading	0.000	0.000	0.000	0.000	0.000	2.534	0.0000	0.5272
paving	0.000	0.000	0.393	0.000	0.000	0.000	0.0000	0.0000
Total	113.198	212.001	28.080	0.232	10.776	93.680	9.804	19.843

Table E6: Daily Emissions (Segmental) - Alternative 1 (continued)

SR47 7: Drainage
Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
Loader	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
Haulers (Truck)	4.032	4.473	0.558	0.005	0.161	7.979	0.138	1.691
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	6.048	6.710	0.837	0.008	0.242	23.936	0.208	5.074
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Vibratory Roller	6.836	13.065	2.000	0.012	0.918	0.000	0.845	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.995	0.044	0.423
Worker commute	4.649	0.482	0.476	0.005	0.041	0.000	0.026	0.000
Demolition	0.000	0.000	0.000	0.000	0.000	0.277	0.000	0.058
Excavation	0.000	0.000	0.000	0.000	0.000	0.259	0.000	0.054
grading	0.000	0.000	0.000	0.000	0.000	2.640	0.000	0.549
Paving	0.000	0.000	0.175	0.000	0.000	0.000	0.000	0.000
Soil dumping	0.000	0.000	0.000	0.000	0.000	0.008	0.000	0.002
Total	49.819	81.442	11.893	0.092	4.614	76.987	4.197	16.308

SR47 7: Drainage
Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	3.194	5.781	0.887	0.006	0.447	0.000	0.4114	0.0000
Loader	3.194	5.781	0.887	0.006	0.447	0.000	0.4114	0.0000
Haulers (Truck)	4.032	4.473	0.558	0.005	0.161	4.388	0.1385	0.9303
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Flatbed	6.048	6.710	0.837	0.008	0.242	13.165	0.2077	2.7909
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Vibratory Roller	6.836	13.065	2.000	0.012	0.918	0.000	0.8446	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.8045	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.097	0.0443	0.2326
Worker commute	4.649	0.482	0.476	0.005	0.041	0.000	0.0258	0.0000
Demolition	0.000	0.000	0.000	0.000	0.000	0.089	0.0000	0.0185
Excavation	0.000	0.000	0.000	0.000	0.000	0.083	0.0000	0.0172
grading	0.000	0.000	0.000	0.000	0.000	0.845	0.0000	0.1757
Paving	0.000	0.000	0.175	0.000	0.000	0.000	0.0000	0.0000
Soil dumping	0.000	0.000	0.000	0.000	0.000	0.003	0.0000	0.0005
Total	49.819	81.442	11.893	0.092	4.614	41.610	4.197	8.817

SR47 8: Retaining Walls and Soundwalls
Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Haulers (Truck)	8.064	8.947	1.116	0.011	0.322	15.957	0.277	3.383
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.305	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	1.453	0.151	0.149	0.002	0.013	19.947	0.008	4.229
Vibratory Roller	6.836	13.065	2.000	0.012	0.918	0.000	0.845	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Concrete Truck	2.581	2.863	0.357	0.003	0.103	3.989	0.089	0.846
Worker commute	4.262	0.442	0.437	0.005	0.038	0.000	0.024	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	1.050	0.000	0.218
Grading	0.000	0.000	0.000	0.000	0.000	5.280	0.000	1.098
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.919	0.000	0.191
Total	51.003	83.857	11.861	0.094	4.815	59.110	4.382	12.502

SR47 8: Retaining Walls and Soundwalls
Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Haulers (Truck)	8.064	8.947	1.116	0.011	0.322	8.777	0.2769	1.8606
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.3046	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	1.453	0.151	0.149	0.002	0.013	10.971	0.0081	2.3258
Vibratory Roller	6.836	13.065	2.000	0.012	0.918	0.000	0.8446	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.4022	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Concrete Truck	2.581	2.863	0.357	0.003	0.103	2.194	0.0886	0.4652
Worker commute	4.262	0.442	0.437	0.005	0.038	0.000	0.0237	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.336	0.0000	0.0699
Grading	0.000	0.000	0.000	0.000	0.000	1.690	0.0000	0.3514
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.294	0.0000	0.0612
Total	51.003	83.857	11.861	0.094	4.815	30.843	4.382	6.530

Appendix E:

Table E6: Daily Emissions (Segmental) - Alternative 1 (continued)

SR47 9: Striping, Lighting and Signing
Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Boom	13.732	34.599	3.617	0.041	1.507	0.000	1.386	0.000
Loader	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
Generator	8.108	16.124	2.448	0.017	0.993	0.000	0.914	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	4.359	0.452	0.447	0.005	0.039	59.840	0.024	12.686
Compressor	8.878	18.393	2.831	0.017	1.312	0.000	1.207	0.000
Striper (Truck)	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	4.649	0.482	0.476	0.005	0.041	0.000	0.026	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.412	0.000	0.086
Total	52.289	99.591	13.202	0.116	5.203	72.220	4.756	15.309

SR47 9: Striping, Lighting and Signing
Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Boom	13.732	34.599	3.617	0.041	1.507	0.000	1.3863	0.0000
Loader	3.194	5.781	0.887	0.006	0.447	0.000	0.4114	0.0000
Generator	8.108	16.124	2.448	0.017	0.993	0.000	0.9139	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	4.359	0.452	0.447	0.005	0.039	32.912	0.0242	6.9773
Compressor	8.878	18.393	2.831	0.017	1.312	0.000	1.2067	0.0000
Striper (Truck)	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Worker commute	4.649	0.482	0.476	0.005	0.041	0.000	0.0258	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.132	0.0000	0.0274
Total	52.289	99.591	13.202	0.116	5.203	39.626	4.756	8.400

SHB and SR-47: Stockpile Area
Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Stock piles	0.000	0.000	0.000	0.000	0.000	79.8	0.0	16.6

SHB and SR-47: Stockpile Area
Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

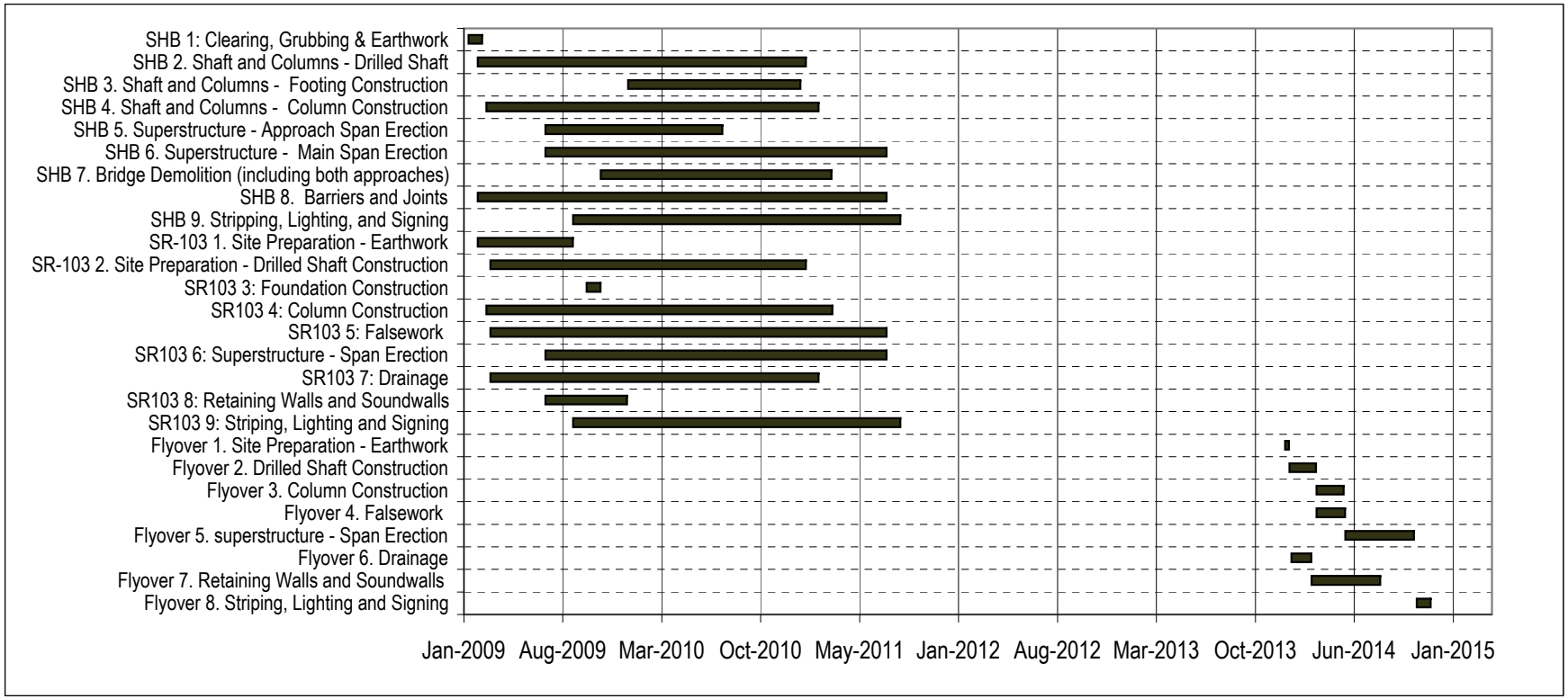
	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Stock piles	0.000	0.000	0.000	0.000	0.000	25.541	0.0000	5.3125

Note:
Stock pile areas were not specified or calculated for each construction phases. The maximum areas that might be covered each day by the whole project was used to calculate the total fugitive dust emissions from stock piles.

Appendix F
Construction Emission Calculations – Alternative 2, Segmental Method

Appendix F:

Table F1: Construction Schedule (Segmental) - Alternative 2



Source: DMJM Harris, May 2005, January 2007

Appendix F:

Table F2: Maximum Construction Emissions (Segmental): By Source - Alternative 2

Maximum Daily Construction Emissions

		CO (lb/day)	NOx (lb/day)	ROG (lb/day)	SOx (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
With Watering to Control Fugitive Dust	Maximum Construction Equipment Exhaust	777	1619	193	2	76	69
	Maximum Workers Commute	68	7.1	7.0	0.08	0.61	0.38
	Maximum Fugitive Dust	NA	NA	NA	NA	717	152
	Maximum Combined Daily Emissions	**846**	**1626**	**200**	**1.9**	**794**	**222**
SCAQMD Thresholds		550	100	75	150	150	55
Exceeding Thresholds?		YES	YES	YES	NO	YES	YES

Note: The maximum daily emissions from equipment exhaust, fugitive dust, and workers commute are not additive because these worst case emissions do not always occur on the same day.

Appendix F:
Table F3. Summary of Daily Emissions (Segmental) - Alternative 2

		Total Emissions without Watering (lb/day)									
	Construction Phases	**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**PM_{10} Fugitive**	**PM_{10} Total**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ Fugitive**	**$PM_{2.5}$ Total**
1	SHB 1: Clearing, Grubbing & Earthwork	7.34	8.24	1.38	0.01	0.55	8.98	9.52	0.49	1.90	2.40
2	SHB 2. Shaft and Columns - Drilled Shaft Construction	75.72	159.39	18.16	0.18	6.63	73.71	80.34	6.04	15.62	21.65
3	SHB 3. Shaft and Columns - Footing Construction	59.47	117.46	13.89	0.14	5.03	61.05	66.08	4.56	12.94	17.50
4	SHB 4. Shaft and Columns - Column Construction	34.23	74.90	8.57	0.08	3.04	33.91	36.95	2.77	7.19	9.96
5	SHB 5. Superstructure - Approach Span Erection	93.37	174.71	21.24	0.20	8.22	199.46	207.68	7.44	42.26	49.70
6	SHB 6. Superstructure - Main Span Erection	96.75	191.03	23.43	0.21	10.11	213.56	223.67	9.17	45.27	54.44
7	SHB 7. Bridge Demolition (including both approaches)	83.67	126.74	17.80	0.15	7.10	127.35	134.45	6.44	26.98	33.43
8	SHB 8. Barriers and Joints	6.84	6.02	0.91	0.01	0.25	17.68	17.94	0.21	3.75	3.96
9	SHB 9. Stripping, Lighting, and Signing	36.67	94.48	10.19	0.11	3.58	47.59	51.16	3.27	10.09	13.35
10	SR-103 1. Site Preparation - Earthwork	77.96	133.61	18.39	0.15	7.40	95.74	103.14	6.75	20.30	27.04
11	SR-103 2. Site Preparation - Drilled Shaft Construction	52.62	105.88	12.48	0.12	4.50	65.11	69.61	4.09	13.79	17.88
12	SR103 3: Foundation Construction	47.70	101.03	11.71	0.11	4.35	47.93	52.28	3.97	10.16	14.13
13	SR103 4: Column Construction	28.27	53.46	6.50	0.06	2.27	55.85	58.12	2.06	11.84	13.90
14	SR103 5: Falsework	57.72	106.36	14.09	0.12	5.96	51.86	57.82	5.46	10.99	16.45
15	SR103 6: Superstructure - Span Erection	115.09	222.08	27.92	0.25	10.53	175.96	186.49	9.58	37.25	46.83
16	SR103 7: Drainage	50.77	86.48	11.81	0.10	4.49	76.99	81.48	4.09	16.31	20.39
17	SR103 8: Retaining Walls and Soundwalls	51.48	86.38	11.82	0.10	4.75	59.11	63.86	4.33	12.50	16.83
18	SR103 9: Striping, Lighting and Signing	54.49	107.23	13.16	0.13	5.03	72.22	77.25	4.59	15.31	19.90
20	Flyover 1. Site Preparation - Earthwork	11.34	18.12	2.59	0.03	0.80	9.97	10.77	0.72	2.11	2.84
21	Flyover 2. Drilled Shaft Construction	43.65	72.98	9.52	0.13	3.19	29.96	33.16	2.89	6.35	9.24
22	Flyover 3. Column Construction	27.39	45.09	6.25	0.07	2.21	21.94	24.15	2.00	4.65	6.65
23	Flyover 4. Falsework	59.33	102.79	14.11	0.15	5.63	15.96	21.58	5.16	3.38	8.54
24	Flyover 5. superstructure - Span Erection	72.36	117.94	16.14	0.18	6.28	57.51	63.79	5.69	12.19	17.88
25	Flyover 6. Drainage	25.44	41.89	5.95	0.06	2.30	7.38	9.67	2.10	1.56	3.65
26	Flyover 7. Retaining Walls and Soundwalls	62.50	84.94	12.27	0.14	4.72	35.60	40.33	4.26	7.52	11.77
27	Flyover 8. Striping, Lighting and Signing	15.50	26.74	3.74	0.04	1.34	0.11	1.46	1.23	0.02	1.25
	SHB SR103 Stock Piles	0.00	0.00	0.00	0.00	0.00	79.82	79.82	0.00	16.60	16.60
	Overlapping phases										
	2,4,8,10,11,13,14,16	384	726	91	0.83	35	551	585	31	116	148
	2,4,5,6,8,10,11,13,14,15,16,17	741	1400	175	1.59	68	1199	1267	62	254	316
	2,4,5,6,8,9,11,12,13,14,15,16,17,18	802	1569	192	1.79	74	1271	1344	67	269	336
	2,3,4,5,6,7,8,9,11,13,14,15,16,18	846	1626	200	1.87	77	1352	1429	70	286	356
	2,3,4,6,7,8,9,11,13,14,15,16,18	752	1452	179	1.67	69	1153	1221	62	244	306
	20	15	28	4	0.03	1.2	90	91	1.1	19	20
	21,25	67	113	15	0.20	5.3	117	122	4.9	25	29
	22,23,26	143	229	32	0.38	12	153	165	11	32	43
	27	15	27	3.8	0.04	1.3	80	81	1.2	17	18
	Max. Daily Emissions	**846**	**1626**	**200**	**1.9**	**77**	**1352**	**1429**	**70**	**286**	**356**

Note:
1. Based on the construction schedule, emissions from overlapping construction phases were added together to evaluate the worst case scenarios. The maximum daily emissions represent the scenario of overlapping phases with the highest emissions.
2. Fugitive dust emissions from stock piles were not calculated for each construction phase. The emissions were calculated separately based on a maximum area that the stock piles will cover during the entire construction duration.
3. The fugitive dusts were assumed to be controlled by 68% by watering the site 3 times per day, and 45% by watering the unpaved roads 3 times a day, according to the control efficiencies in SCAQMD CEQA Air Quality Handbook Table 11-4.

Appendix F:
Table F3. Summary of Daily Emissions (Segmental) - Alte

		Total Emissions with Watering (lb/day)									
	Construction Phases	**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**PM_{10} Fugitive**	**PM_{10} Total**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ Fugitive**	**$PM_{2.5}$ Total**
1	SHB 1: Clearing, Grubbing & Earthwork	7.34	8.24	1.38	0.01	0.55	4.94	5.48	0.49	1.05	1.54
2	SHB 2. Shaft and Columns - Drilled Shaft Construction	75.72	159.39	18.16	0.18	6.63	40.10	46.73	6.04	8.50	14.54
3	SHB 3. Shaft and Columns - Footing Construction	59.47	117.46	13.89	0.14	5.03	33.30	38.33	4.56	7.06	11.62
4	SHB 4. Shaft and Columns - Column Construction	34.23	74.90	8.57	0.08	3.04	18.65	21.69	2.77	3.95	6.72
5	SHB 5. Superstructure - Approach Span Erection	93.37	174.71	21.24	0.20	8.22	108.17	116.39	7.44	22.92	30.36
6	SHB 6. Superstructure - Main Span Erection	96.75	191.03	23.43	0.21	10.11	117.12	127.22	9.17	24.83	33.99
7	SHB 7. Bridge Demolition (including both approaches)	83.67	126.74	17.80	0.15	7.10	69.20	76.30	6.44	14.66	21.11
8	SHB 8. Barriers and Joints	6.84	6.02	0.91	0.01	0.25	9.73	9.98	0.21	2.06	2.27
9	SHB 9. Stripping, Lighting, and Signing	36.67	94.48	10.19	0.11	3.58	26.11	29.69	3.27	5.54	8.80
10	SR-103 1. Site Preparation - Earthwork	77.96	133.61	18.39	0.15	7.40	52.66	60.06	6.75	11.16	17.91
11	SR-103 2. Site Preparation - Drilled Shaft Construction	52.62	105.88	12.48	0.12	4.50	35.06	39.55	4.09	7.43	11.52
12	SR103 3: Foundation Construction	47.70	101.03	11.71	0.11	4.35	26.35	30.70	3.97	5.59	9.56
13	SR103 4: Column Construction	28.27	53.46	6.50	0.06	2.27	30.72	32.99	2.06	6.51	8.57
14	SR103 5: Falsework	57.72	106.36	14.09	0.12	5.96	28.52	34.49	5.46	6.05	11.50
15	SR103 6: Superstructure - Span Erection	115.09	222.08	27.92	0.25	10.53	93.68	104.21	9.58	19.84	29.42
16	SR103 7: Drainage	50.77	86.48	11.81	0.10	4.49	41.61	46.10	4.09	8.82	12.90
17	SR103 8: Retaining Walls and Soundwalls	51.48	86.38	11.82	0.10	4.75	30.84	35.60	4.33	6.53	10.86
18	SR103 9: Striping, Lighting and Signing	54.49	107.23	13.16	0.13	5.03	39.63	44.65	4.59	8.40	12.99
20	Flyover 1. Site Preparation - Earthwork	11.34	18.12	2.59	0.03	0.80	5.49	6.28	0.72	1.16	1.88
21	Flyover 2. Drilled Shaft Construction	43.65	72.98	9.52	0.13	3.19	16.24	19.43	2.89	3.44	6.33
22	Flyover 3. Column Construction	27.39	45.09	6.25	0.07	2.21	12.07	14.27	2.00	2.56	4.55
23	Flyover 4. Falsework	59.33	102.79	14.11	0.15	5.63	8.78	14.40	5.16	1.86	7.02
24	Flyover 5. superstructure - Span Erection	72.36	117.94	16.14	0.18	6.28	31.63	37.91	5.69	6.71	12.40
25	Flyover 6. Drainage	25.44	41.89	5.95	0.06	2.30	3.59	5.88	2.10	0.76	2.85
26	Flyover 7. Retaining Walls and Soundwalls	62.50	84.94	12.27	0.14	4.72	17.70	22.43	4.26	3.74	8.00
27	Flyover 8. Striping, Lighting and Signing	15.50	26.74	3.74	0.04	1.34	0.04	1.38	1.23	0.01	1.23
	SHB SR103 Stock Piles	0.00	0.00	0.00	0.00	0.00	25.54	25.54	0.00	5.31	5.31
	Overlapping phases										
	2,4,8,10,11,13,14,16	384	726	91	0.8	35	283	317	31	60	91
	2,4,5,6,8,10,11,13,14,15,16,17	741	1400	175	1.6	68	632	701	62	134	196
	2,4,5,6,8,9,11,12,13,14,15,16,17,18	802	1569	192	1.8	74	672	746	67	142	209
	2,3,4,5,6,7,8,9,11,13,14,15,16,18	846	1626	200	1.9	77	717	794	70	152	222
	2,3,4,6,7,8,9,11,13,14,15,16,18	752	1452	179	1.7	69	609	677	62	129	191
	20	15	28	3.6	0.03	1.2	31	32	1.1	6	8
	21,25	67	113	15	0.20	5.3	45	51	4.9	10	14
	22,23,26	143	229	32	0.38	12	64	76	11	13	25
	27	15	27	3.8	0.04	1.3	26	27	1.2	5.3	6.5
	Max. Daily Emissions	**846**	**1626**	**200**	**1.9**	**77**	**717**	**794**	**70**	**152**	**222**

Appendix F:
Table F3. Summary of Daily Emissions (Segmental) - Alte

		Construction Equipment Exhaust (lb/day)						Workers Commute (lb/day)					
	Construction Phases	**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**$PM_{2.5}$ Exhaust**	**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**$PM_{2.5}$ Exhaust**
1	SHB 1: Clearing, Grubbing & Earthwork	5.79	8.08	1.23	0.01	0.53	0.48	1.550	0.161	0.159	0.002	0.014	0.009
2	SHB 2. Shaft and Columns - Drilled Shaft Construction	70.29	158.83	17.60	0.18	6.58	6.01	5.424	0.563	0.556	0.006	0.048	0.030
3	SHB 3. Shaft and Columns - Footing Construction	57.16	117.20	13.64	0.14	5.01	4.55	2.314	0.257	0.256	0.003	0.024	0.015
4	SHB 4. Shaft and Columns - Column Construction	31.52	74.62	8.29	0.08	3.02	2.75	2.712	0.281	0.278	0.003	0.024	0.015
5	SHB 5. Superstructure - Approach Span Erection	87.56	174.11	20.64	0.19	8.17	7.41	5.811	0.603	0.595	0.006	0.052	0.032
6	SHB 6. Superstructure - Main Span Erection	90.94	190.43	22.83	0.20	10.05	9.13	5.811	0.603	0.595	0.006	0.052	0.032
7	SHB 7. Bridge Demolition (including both approaches)	77.47	126.09	17.16	0.15	7.05	6.41	6.199	0.643	0.635	0.007	0.055	0.034
8	SHB 8. Barriers and Joints	4.51	5.78	0.67	0.01	0.23	0.20	2.325	0.241	0.238	0.003	0.021	0.013
9	SHB 9. Stripping, Lighting, and Signing	32.79	94.08	9.79	0.10	3.54	3.24	3.874	0.402	0.397	0.004	0.034	0.022
10	SR-103 1. Site Preparation - Earthwork	72.15	133.00	17.79	0.15	7.35	6.71	5.811	0.603	0.595	0.006	0.052	0.032
11	SR-103 2. Site Preparation - Drilled Shaft Construction	47.20	105.32	11.92	0.12	4.45	4.06	5.424	0.563	0.556	0.006	0.048	0.030
12	SR103 3: Foundation Construction	44.98	100.75	11.43	0.11	4.33	3.96	2.712	0.281	0.278	0.003	0.024	0.015
13	SR103 4: Column Construction	25.55	53.18	6.22	0.06	2.24	2.04	2.712	0.281	0.278	0.003	0.024	0.015
14	SR103 5: Falsework	51.91	105.75	13.50	0.12	5.91	5.42	5.811	0.603	0.595	0.006	0.052	0.032
15	SR103 6: Superstructure - Span Erection	105.41	221.07	26.93	0.24	10.45	9.53	9.686	1.005	0.992	0.011	0.086	0.054
16	SR103 7: Drainage	46.12	86.00	11.34	0.10	4.45	4.06	4.649	0.482	0.476	0.005	0.041	0.026
17	SR103 8: Retaining Walls and Soundwalls	47.22	85.93	11.39	0.09	4.72	4.30	4.262	0.442	0.437	0.005	0.038	0.024
18	SR103 9: Striping, Lighting and Signing	49.06	106.66	12.61	0.12	4.98	4.56	5.424	0.563	0.556	0.006	0.048	0.030
20	Flyover 1. Site Preparation - Earthwork	9.75	17.96	2.43	0.03	0.78	0.71	1.585	0.157	0.169	0.003	0.022	0.014253
21	Flyover 2. Drilled Shaft Construction	41.01	72.72	9.24	0.12	3.16	2.87	2.641	0.262	0.281	0.004	0.037	0.023755
22	Flyover 3. Column Construction	24.75	44.83	5.97	0.07	2.17	1.97	2.641	0.262	0.281	0.004	0.037	0.023755
23	Flyover 4. Falsework	56.69	102.53	13.83	0.15	5.59	5.13	2.641	0.262	0.281	0.004	0.037	0.023755
24	Flyover 5. superstructure - Span Erection	69.19	117.62	15.80	0.18	6.24	5.66	3.170	0.314	0.337	0.005	0.044	0.028506
25	Flyover 6. Drainage	24.12	41.76	5.81	0.06	2.28	2.08	1.321	0.131	0.140	0.002	0.018	0.011877
26	Flyover 7. Retaining Walls and Soundwalls	59.33	84.62	11.93	0.14	4.68	4.23	3.170	0.314	0.337	0.005	0.044	0.028506
27	Flyover 8. Striping, Lighting and Signing	13.92	26.58	3.58	0.04	1.32	1.21	1.585	0.157	0.169	0.003	0.022	0.014253
	SHB SR103 Stock Piles	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000
	Overlapping phases												
	2,4,8,10,11,13,14,16	349	722	87	0.80	34	31	35	3.62	3.57	0.038	0.31	0.19
	2,4,5,6,8,10,11,13,14,15,16,17	680	1394	169	1.53	68	62	60	6.27	6.19	0.067	0.54	0.34
	2,4,5,6,8,9,11,12,13,14,15,16,17,18	735	1563	185	1.72	73	67	67	6.92	6.83	0.073	0.59	0.37
	2,3,4,5,6,7,8,9,11,13,14,15,16,18	777	1619	193	1.80	76	69	68	7.09	7.00	0.076	0.61	0.38
	2,3,4,6,7,8,9,11,13,14,15,16,18	690	1445	173	1.60	68	62	62	6.49	6.41	0.069	0.56	0.35
	20	12	27	3.3	0.03	1.2	1.1	2.6	0.3	0.28	0.002	0.02	0.019
	21,25	63	113	15	0.19	5.2	4.8	4.3	0.4	0.49	0.005	0.05	0.048
	22,23,26	134	228	31	0.36	12.0	11.0	9.2	0.9	1.04	0.012	0.11	0.103
	27	14	26	3.6	0.04	1.3	1.2	1.7	0.2	0.20	0.002	0.02	0.019
	Max. Daily Emissions	**777**	**1619**	**193**	**1.8**	**76**	**69**	**68**	**7.1**	**7.0**	**0.08**	**0.61**	**0.38**

Appendix F:

Table F4: Construction Equipment Usage (Segmental) - Alternative 2

Schuyler Heim Bridge (SHB)

SHB 1: Clearing, Grubbing & Earthwork

Construction duration from 1/11/2009 to 2/11/2009 This work will occur in stages as work areas become available.

Number of construction Workers 4 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe/excavator	NA	1	1	20	8	160	8	NA	NA	NA	NA
Pick Up	NA	1	1	20	4	80	NA	60	1	5	55
Haul Truck	NA	1	1	20	4	80	NA	50	2	4	46
Worker commute	NA	4	NA	NA	NA	NA	NA	40	1	0	40

SHB 2. Shaft and Columns - Drilled Shaft Construction

Construction duration from 2/1/2009 to 2/1/2011

Number of construction Workers 14 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**CIDH**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per CIDH**	**per CIDH**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
200 ton crane	NA	2	87	10	80	13920	8	NA	NA	NA	NA
Caisson Drill	NA	1	87	4	32	2784	8	NA	NA	NA	NA
200 ton gantry	NA	2	87	7	56	9744	8	NA	NA	NA	NA
Generator	NA	2	87	10	80	13920	8	NA	NA	NA	NA
Flatbed	NA	2	87	8	64	11136	NA	50	1.5	6	44
Pick Up	NA	4	87	10	80	27840	NA	50	1.5	10	40
Concrete Truck	NA	10	87	3	24	20880	NA	32	2	2	30
Concrete Pump Truck	NA	2	87	3	24	4176	8	NA	NA	NA	NA
Compressor	NA	2	87	10	80	13920	8	NA	NA	NA	NA
Water Truck	NA	1	87	4	32	2784	8	NA	NA	NA	NA
Worker commute	NA	14	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	3848	40	ft^3	290
Soil loading	333	47.5	yd^3	7

Appendix F:

Table F4: Construction Equipment Usage (Segmental) - Alternative 2 (continued)

SHB 3. Shaft and Columns - Footing Construction

Construction duration from 1/1/2010 to 1/20/2011

Number of construction Workers 7 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Embank. Wall**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per Wall**	**per Wall**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe/excavator	NA	2	2	5	40	160	8	NA	NA	NA	NA
200 ton crane	NA	1	2	2	16	32	8	NA	NA	NA	NA
Generator	NA	1	2	10	80	160	8	NA	NA	NA	NA
Haul Truck	NA	4	2	5	40	320	NA	50	2	4	46
Pick Up	NA	2	2	10	80	320	NA	50	1.5	10	40
Concrete Truck	NA	12	2	3	24	576	NA	32	2	2	30
Concrete Pump Truck	NA	2	2	3	24	96	8	NA	NA	NA	NA
Compressor	NA	1	2	10	80	160	8	NA	NA	NA	NA
Water Truck	NA	1	2	4	32	64	8	NA	NA	NA	NA
Worker commute	NA	7	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	2400	86	ft^3	28
Soil loading	207	30	yd^3	7

SHB 4. Shaft and Columns - Column Construction

Construction duration from 2/20/2009 to 3/1/2011

Number of construction Workers 7 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Columns**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per Col.**	**per Col.**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
140 ton crane	NA	1	87	1	8	696	8	NA	NA	NA	NA
Generator	NA	1	87	4	32	2784	8	NA	NA	NA	NA
Flatbed	NA	1	87	2.5	20	1740	NA	50	1.5	6	44
Pick Up	NA	2	87	4	32	5568	NA	50	1.5	10	40
Concrete Truck	NA	4	87	2	16	5568	NA	32	2	2	30
Concrete Pump Truck	NA	2	87	2	16	2784	8	NA	NA	NA	NA
Compressor	NA	1	87	4	32	2784	8	NA	NA	NA	NA
Worker commute	NA	7	NA	NA	NA	NA	NA	40	1	0	40

Appendix F:

Table F4: Construction Equipment Usage (Segmental) - Alternative 2 (continued)

SHB 5. Superstructure - Approach Span Erection

Construction duration from 7/1/2009 to 7/30/2010

Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
275 ton crane	NA	1	18	360	2880	2880	8	NA	NA	NA	NA
Rough Terrain (f-lift)	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
200 ton gantry	NA	1	20	400	3200	3200	8	NA	NA	NA	NA
Generator	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
Semi Truck	NA	10	10	200	1600	16000	NA	42	1	2	40
Flatbed	NA	6	12	240	1920	11520	NA	50	1.5	6	44
Pick Up	NA	10	20	400	3200	32000	NA	50	1.5	10	40
Concrete Truck	NA	10	10	200	1600	16000	NA	32	2	2	30
Concrete Pump Truck	NA	2	10	200	1600	3200	8	NA	NA	NA	NA
Compressor	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	127340	2122	ft^3	60
Grading	2	0.1	acre	20
Soil loading	1572	79	yd^3	20

Table F4: Construction Equipment Usage (Segmental) - Alternative 2 (continued)

SHB 6. Superstructure - Main Span Erection

Construction duration from 7/1/2009 to 7/30/2011

Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
400 ton crane	NA	2	10	200	1600	3200	8	NA	NA	NA	NA
Rough Terrain (f-lift)	NA	4	10	200	1600	6400	8	NA	NA	NA	NA
200 ton gantry	NA	2	14	280	2240	4480	8	NA	NA	NA	NA
Generator	NA	3	20	400	3200	9600	8	NA	NA	NA	NA
Semi Truck	NA	20	10	200	1600	32000	NA	42	1	2	40
Flatbed	NA	6	18	360	2880	17280	NA	50	1.5	6	44
Pick Up	NA	10	18	360	2880	28800	NA	50	1.5	10	40
Concrete Truck	NA	1	5	50	400	400	NA	32	2	2	30
Concrete Pump Truck	NA	1	5	50	400	400	8	NA	NA	NA	NA
Compressor	NA	3	20	400	3200	9600	8	NA	NA	NA	NA
Loader	NA	2	1	20	160	320	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	11550	192.5	ft^3	60
Grading	1.5	0.1	acre	30
Soil loading	42.8	2	yd^3	20

Appendix F:

SHB 7. Bridge Demolition (including both approaches)

Construction duration from 11/1/2009 to 3/30/2011

Number of construction Workers 16 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Pick Up	NA	6	6	120	3	2160	NA	50	1.5	10	40
Haul Truck	NA	10	6	120	4	4800	NA	50	2	4	46
Compressor	NA	4	6	120	8	3840	8	NA	NA	NA	NA
Generator	NA	4	6	120	6	2880	8	NA	NA	NA	NA
Flatbed	NA	4	6	120	3	1440	NA	50	1.5	6	44
Backhoe/excavator	NA	4	6	120	8	3840	8	NA	NA	NA	NA
Loader	NA	3	6	120	4	1440	8	NA	NA	NA	NA
Worker commute	NA	16	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Demolition	62500	391	ft^3	160
Excavation	40300	672	ft^4	60
Grading	2	0.1	acre	20
Soil loading	299	15	yd^3	20

SHB 8. Barriers and Joints

Construction duration from 2/1/2009 to 7/30/2011

Number of construction Workers 6 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Concrete Trucks	NA	1	6	120	480	480	NA	50	1	6	44
Flatbed Truck	NA	2	6	120	960	1920	NA	32	2	2	30
Pick Up	NA	1	6	120	480	480	NA	40	1	4	36
Semi Truck	NA	1	6	120	480	480	NA	42	1	2	40
Worker commute	NA	6	NA	NA	NA	NA	NA	40	1	0	40

SHB 9. Stripping, Lighting, and Signing

Construction duration from 9/1/2009 to 8/30/2011

Number of construction Workers 10 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Pick Up	NA	4	2	40	3	480	NA	50	1.5	10	40
Paint truck	NA	1	1.5	30	7	210	8	NA	NA	NA	NA
Compressor	NA	1	1.5	30	7	210	8	NA	NA	NA	NA
Bucket Truck	NA	2	2	40	5	400	8	NA	NA	NA	NA
Semi Truck	NA	2	0.5	10	4	80	NA	42	1	2	40
Boom Truck	NA	1	0.5	10	6	60	8	NA	NA	NA	NA
Worker commute	NA	10	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
excavation	11781	589	ft^3	20

Appendix F:

Table F4: Construction Equipment Usage (Segmental) - Alternative 2 (continued)

SR-103 Truck Expressway

SR-103 1. Site Preparation - Earthwork

Construction duration from 2/1/2009 to 9/1/2009

Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Loader	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Haulers (Truck)	NA	6	4	80	640	3840	NA	50	2	4	46
Generator	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Flatbed	NA	2	6	120	960	1920	NA	50	1.5	6	44
Pick Up	NA	6	6	120	960	5760	NA	50	1.5	10	40
Grader	NA	2	3	60	480	960	8	NA	NA	NA	NA
Vibratory loader	NA	2	3	60	480	960	8	NA	NA	NA	NA
Asphalt Paver	NA	1	2	40	320	320	8	NA	NA	NA	NA
Compressor	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Water Truck	NA	1	5	100	800	800	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

SR-103 2. Site Preparation - Drilled Shaft Construction

Construction duration from 3/1/2009 to 2/1/2011

Number of construction Workers 14 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**CIDH**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per CIDH**	**per CIDH**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
200 ton crane	NA	1	261	10	80	20880	8	NA	NA	NA	NA
Caisson Drill	NA	1	261	4	32	8352	8	NA	NA	NA	NA
140 ton crane	NA	1	261	7	56	14616	8	NA	NA	NA	NA
Generator	NA	2	261	10	80	41760	8	NA	NA	NA	NA
Flatbed	NA	2	261	10	80	41760	NA	50	1.5	6	44
Pick Up	NA	4	261	10	80	83520	NA	50	1.5	10	40
Concrete Truck	NA	5	261	2	16	20880	NA	32	2	2	30
Concrete Pump Truck	NA	1	261	2	16	4176	8	NA	NA	NA	NA
Compressor	NA	1	261	1	8	2088	8	NA	NA	NA	NA
Water Truck	NA	1	261	4	32	8352	8	NA	NA	NA	NA
Worker commute	NA	14	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Demolition	29518	492	ft^3	60
Excavation	35422	590	ft^3	60
Grading	2	0.1	acre	20
Soil Loading	91	5	yd^3	20

Appendix F:

Table F4: Construction Equipment Usage (Segmental) - Alternative 2 (continued)

SR103 3: Foundation Construction

Construction duration from 10/1/2009 to 11/1/2009
Number of construction Workers 7 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe/excavator	NA	1	1	20	160	160	8	NA	NA	NA	NA
140 ton crane	NA	1	0.5	10	80	40	8	NA	NA	NA	NA
Generator	NA	1	1	20	160	160	8	NA	NA	NA	NA
Haul Truck	NA	4	0.5	10	80	160	NA	50	2	4	46
Pick Up	NA	3	1	20	160	480	NA	50	1.5	10	40
Concrete Truck	NA	1	0.25	5	40	10	NA	32	2	2	30
Concrete Pump Truck	NA	1	0.25	5	40	10	8	NA	NA	NA	NA
Compressor	NA	1	0.5	10	80	40	8	NA	NA	NA	NA
Water Truck	NA	1	0.5	10	80	40	8	NA	NA	NA	NA
Pile Driver	NA	2	1	20	160	320	8	NA	NA	NA	NA
Worker commute	NA	7	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	408	81.6	ft^3	5
Soil Loading	3.0	0.6	yd^3	5

SR103 4: Column Construction

Construction duration from 2/20/2009 to 4/1/2011
Number of construction Workers 7 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Columns**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per Col.**	**per Col.**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
140 ton crane	NA	1	261	1	8	2088	8	NA	NA	NA	NA
Generator	NA	1	261	4	32	8352	8	NA	NA	NA	NA
Flatbed	NA	2	261	2	16	8352	NA	50	1.5	6	44
Pick Up	NA	4	261	4	32	33408	NA	50	1.5	10	40
Concrete Truck	NA	2	261	1	8	4176	NA	32	2	2	30
Concrete Pump Truck	NA	1	261	1	8	2088	8	NA	NA	NA	NA
Compressor	NA	1	261	4	32	8352	8	NA	NA	NA	NA
Worker commute	NA	7	NA	NA	NA	NA	NA	40	1	0	40

Appendix F:

Table F4: Construction Equipment Usage (Segmental) - Alternative 2 (continued)

SR103 5: Falsework

Construction duration from 3/1/2009 to 7/30/2011
Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
100 ton crane	NA	1	30	600	4800	4800	8	NA	NA	NA	NA
Generator	NA	2	30	600	4800	9600	8	NA	NA	NA	NA
Flatbed	NA	2	30	600	4800	9600	NA	50	1.5	6	44
Pick Up	NA	4	30	600	4800	19200	NA	50	1.5	10	40
Rough Terrain (f - lift)	NA	4	30	600	4800	19200	8	NA	NA	NA	NA
Scissor Lift	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
Compressor	NA	2	30	600	4800	9600	8	NA	NA	NA	NA
Boom	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

SR103 6: Superstructure - Span Erection

Construction duration from 7/1/2009 to 7/30/2011
Number of construction Workers 25 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
275 ton crane	NA	1	18	360	2880	2880	8	NA	NA	NA	NA
Rough Terrain (f-lift)	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
140 ton crane	NA	1	20	400	3200	3200	8	NA	NA	NA	NA
Generator	NA	4	18	360	2880	11520	8	NA	NA	NA	NA
Semi Truck	NA	4	16	320	2560	10240	NA	42	1	2	40
Flatbed	NA	4	20	400	3200	12800	NA	50	1.5	6	44
Pick Up	NA	10	20	400	3200	32000	NA	50	1.5	10	40
Concrete Truck	NA	12	9	180	1440	17280	NA	32	2	2	30
Concrete Pump Truck	NA	4	9	180	1440	5760	8	NA	NA	NA	NA
Compressor	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
Worker commute	NA	25	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Demolition	120000	12000	ft^3	10
Excavation	12000	1200	ft^3	10
grading	1.5	0.3	acre	5
paving	1.5	0.15	acre	10

Appendix F:

Table F4: Construction Equipment Usage (Segmental) - Alternative 2 (continued)

SR103 7: Drainage

Construction duration from 3/1/2009 to 3/1/2011

Number of construction Workers 12 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe	NA	1	6	120	960	960	8	NA	NA	NA	NA
Loader	NA	1	6	120	960	960	8	NA	NA	NA	NA
Haulers (Truck)	NA	2	2	40	320	640	NA	50	2	4	46
Generator	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Flatbed	NA	4	6	120	960	3840	NA	50	1.5	6	44
Pick Up	NA	4	6	120	960	3840	NA	50	1.5	10	40
Vibratory Roller	NA	2	3	60	480	960	8	NA	NA	NA	NA
Compressor	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Water Truck	NA	1	3	60	480	480	8	NA	NA	NA	NA
Concrete Truck	NA	1	1	20	160	160	NA	32	2	2	30
Worker commute	NA	12	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Demolition	105600	660	ft^3	160
Excavation	73920	616	ft^4	120
grading	2	0.10	acre	20
Paving	2	0.07	acre	30
Soil dumping	10	0.5	yd^3	60

SR103 8: Retaining Walls and Soundwalls

Construction duration from 7/1/2009 to 12/30/2009

Number of construction Workers 11 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Loader	NA	2	6	120	960	1920	8	NA	NA	NA	NA
Haulers (Truck)	NA	4	5	100	800	3200	NA	50	2	4	46
Generator	NA	1	6	120	960	960	8	NA	NA	NA	NA
Flatbed	NA	2	4	80	640	1280	NA	50	1.5	6	44
Pick Up	NA	2	6	120	960	1920	NA	50	1.5	10	40
Vibratory Roller	NA	2	3	60	480	960	8	NA	NA	NA	NA
Compressor	NA	1	6	120	960	960	8	NA	NA	NA	NA
Water Truck	NA	1	4	80	640	640	8	NA	NA	NA	NA
Concrete Truck	NA	2	1	20	160	320	NA	32	2	2	30
Worker commute	NA	11	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	100000	2500	ft^3	40
Grading	2	0.2	acre	10
Soil Loading	231	23	yd^3	10

Appendix F:

Table F4: Construction Equipment Usage (Segmental) - Alternative 2 (continued)

SR103 9: Striping, Lighting and Signing

Construction duration from 7/1/2009 to 8/30/2011

Number of construction Workers 14 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Boom	NA	4	4	80	640	2560	8	NA	NA	NA	NA
Loader	NA	1	2	40	320	320	8	NA	NA	NA	NA
Generator	NA	3	6	120	960	2880	8	NA	NA	NA	NA
Flatbed	NA	2	6	120	960	1920	NA	50	1.5	6	44
Pick Up	NA	6	6	120	960	5760	NA	50	1.5	10	40
Compressor	NA	3	6	120	960	2880	8	NA	NA	NA	NA
Striper (Truck)	NA	1	4	80	640	640	8	NA	NA	NA	NA
Worker commute	NA	14	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	29452	982	ft^3	30

SHB and SR-103: Stockpile Area

Construction duration from 1/11/2009 to 8/30/2011

	Maximum Area Covered	**Unit**
Stock Piles	2	acres/day

1. Construction data provided by DMJM Harris, May 2005
2. Stock pile areas were not specified for each construction phases. The maximum areas that might be covered each day by the whole project was used to calculate the total fugitive dust emissions from stock piles.
3. Detailed Flyover construction emission calculations are presented in Appendix A1.

Appendix F:

Table F5: Emission Factors (Segmental) - Alternative 2

SHB 1: Clearing, Grubbing & Earthwork

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe/excavator	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.05590	0.000	0.051	0.000
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Haul Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211

SHB 2. Shaft and Columns - Drilled Shaft Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
200 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.06780	0.000	0.062	0.000
Caisson Drill	Bore/Drill Rigs	2009	lb/hr	0.520	1.229	0.116	0.002	0.05406	0.000	0.050	0.000
200 ton gantry	Other Construction Equipmen	2009	lb/hr	0.429	1.081	0.113	0.001	0.04709	0.000	0.043	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.04139	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Compressor	Other Construction Equipmen	2009	lb/hr	0.429	1.081	0.113	0.001	0.04709	0.000	0.043	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Soil loading	Soil loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

Appendix F:

Table F5: Emission Factors (Segmental) - Alternative 2 (continued)

SHB 3. Shaft and Columns - Footing Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe/excavator	Tractors/Loaders/Backhoes	2010	lb/hr	0.393	0.675	0.102	0.001	0.05205	0.000	0.048	0.000
200 ton crane	Cranes	2010	lb/hr	0.543	1.451	0.159	0.001	0.06422	0.000	0.059	0.000
Generator	Generator Sets	2010	lb/hr	0.329	0.644	0.096	0.001	0.03963	0.000	0.036	0.000
Haul Truck	On-road Delivery	2010	lb/VMT	0.018	0.021	0.003	0.00003	0.00075	0.997	0.001	0.211
Pick Up	On-road passenger	2010	lb/VMT	0.008	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2010	lb/VMT	0.018	0.021	0.003	0.00003	0.00075	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2010	lb/hr	0.743	2.388	0.248	0.003	0.08751	0.000	0.081	0.000
Compressor	Other Construction Equipmen	2010	lb/hr	0.411	1.012	0.106	0.001	0.04415	0.000	0.041	0.000
Water Truck	Off-Highway Trucks	2010	lb/hr	0.743	2.388	0.248	0.003	0.08751	0.000	0.081	0.000
Worker commute	On-road passenger	2010	lb/VMT	0.008	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2010	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Soil loading	Soil loading	2010	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

SHB 4. Shaft and Columns - Column Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.06780	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.04139	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Compressor	Other Construction Equipmen	2009	lb/hr	0.429	1.081	0.113	0.001	0.04709	0.000	0.043	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211

Appendix F:

Table F5: Emission Factors (Segmental) - Alternative 2 (continued)

SHB 5. Superstructure - Approach Span Erection

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
275 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.06780	0.000	0.062	0.000
Rough Terrain (f-lift)	Rough Terrain Forklifts	2009	lb/hr	0.482	0.851	0.137	0.001	0.07185	0.000	0.066	0.000
200 ton gantry	Other Construction Equipmen	2009	lb/hr	0.429	1.081	0.113	0.001	0.04709	0.000	0.043	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.04139	0.000	0.038	0.000
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.00200	1.861	0.002	0.395
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Compressor	Other Construction Equipmen	2009	lb/hr	0.429	1.081	0.113	0.001	0.04709	0.000	0.043	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Soil loading	Soil loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

Table F5: Emission Factors (Segmental) - Alternative 2 (continued)

SHB 6. Superstructure - Main Span Erection

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
400 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.06780	0.000	0.062	0.000
Rough Terrain (f-lift)	Rough Terrain Forklifts	2009	lb/hr	0.482	0.851	0.137	0.001	0.07185	0.000	0.066	0.000
200 ton gantry	Other Construction Equipmen	2009	lb/hr	0.429	1.081	0.113	0.001	0.04709	0.000	0.043	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.04139	0.000	0.038	0.000
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.00200	1.861	0.002	0.395
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Compressor	Other Construction Equipmen	2009	lb/hr	0.429	1.081	0.113	0.001	0.04709	0.000	0.043	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.05590	0.000	0.051	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Soil loading	Soil loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

Appendix F:

SHB 7. Bridge Demolition (including both approaches)

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Haul Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Compressor	Other Construction Equipmen	2009	lb/hr	0.429	1.081	0.113	0.001	0.04709	0.000	0.043	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.04139	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Backhoe/excavator	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.05590	0.000	0.051	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.05590	0.000	0.051	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Demolition	Demolition	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Soil loading	Soil loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

SHB 8. Barriers and Joints

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Concrete Trucks	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.9973	0.001	0.211
Flatbed Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.9973	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.9973	0.000	0.211
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.00200	1.8611	0.002	0.395
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.9973	0.000	0.211

SHB 9. Stripping, Lighting, and Signing

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Paint truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Compressor	Other Construction Equipmen	2009	lb/hr	0.429	1.081	0.113	0.001	0.04709	0.000	0.043	0.000
Bucket Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.00200	1.861	0.002	0.395
Boom Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000

Appendix F:

Table F5: Emission Factors (Segmental) - Alternative 2 (continued)

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SR-103 1. Site Preparation - Earthwork

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.05590	0.000	0.051	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.05590	0.000	0.051	0.000
Haulers (Truck)	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.04139	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Grader	Graders	2009	lb/hr	0.643	1.524	0.183	0.001	0.07958	0.000	0.073	0.000
Vibratory loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.05590	0.000	0.051	0.000
Asphalt Paver	Pavers	2009	lb/hr	0.576	1.032	0.187	0.001	0.07388	0.000	0.068	0.000
Compressor	Other Construction Equipmen	2009	lb/hr	0.429	1.081	0.113	0.001	0.04709	0.000	0.043	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211

SR-103 2. Site Preparation - Drilled Shaft Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
200 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.06780	0.000	0.062	0.000
Caisson Drill	Bore/Drill Rigs	2009	lb/hr	0.520	1.229	0.116	0.002	0.05406	0.000	0.050	0.000
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.06780	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.04139	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Compressor	Other Construction Equipmen	2009	lb/hr	0.429	1.081	0.113	0.001	0.04709	0.000	0.043	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Demolition	Demolition	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Soil Loading	Soil Loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

Appendix F:

Table F5: Emission Factors (Segmental) - Alternative 2 (continued)

SR103 3: Foundation Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe/excavator	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.05590	0.000	0.051	0.000
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.06780	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.04139	0.000	0.038	0.000
Haul Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Compressor	Other Construction Equipmen	2009	lb/hr	0.429	1.081	0.113	0.001	0.04709	0.000	0.043	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Pile Driver	Other Construction Equipmen	2009	lb/hr	0.429	1.081	0.113	0.001	0.04709	0.000	0.043	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Soil Loading	Soil Loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

SR103 4: Column Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.06780	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.04139	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Compressor	Other Construction Equipmen	2009	lb/hr	0.429	1.081	0.113	0.001	0.04709	0.000	0.043	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211

Appendix F:

Table F5: Emission Factors (Segmental) - Alternative 2 (continued)

SR103 5: Falsework

Emission Factors (see Appendix I for details and reference of emission factors)

Equipment Description	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
0											
100 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.06780	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.04139	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Rough Terrain (f - lift)	Rough Terrain Forklifts	2009	lb/hr	0.482	0.851	0.137	0.001	0.07185	0.000	0.066	0.000
Scissor Lift	Other Construction Equipmen	2009	lb/hr	0.429	1.081	0.113	0.001	0.04709	0.000	0.043	0.000
Compressor	Other Construction Equipmen	2009	lb/hr	0.429	1.081	0.113	0.001	0.04709	0.000	0.043	0.000
Boom	Other Construction Equipmen	2009	lb/hr	0.429	1.081	0.113	0.001	0.04709	0.000	0.043	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211

SR103 6: Superstructure - Span Erection

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
275 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.06780	0.000	0.062	0.000
Rough Terrain (f-lift)	Rough Terrain Forklifts	2009	lb/hr	0.482	0.851	0.137	0.001	0.07185	0.000	0.066	0.000
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.06780	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.04139	0.000	0.038	0.000
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.00200	1.861	0.002	0.395
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Compressor	Other Construction Equipmen	2009	lb/hr	0.429	1.081	0.113	0.001	0.04709	0.000	0.043	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Demolition	Demolition	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
grading	grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
paving	paving	2009	lb ROG / acre	0.000	0.000	2.620	0.000	0.000	0.000	0.000	0.000

Appendix F:

Table F5: Emission Factors (Segmental) - Alternative 2 (continued)

SR103 7: Drainage

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.05590	0.000	0.051	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.05590	0.000	0.051	0.000
Haulers (Truck)	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.04139	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Vibratory Roller	Rollers	2009	lb/hr	0.427	0.817	0.125	0.001	0.05738	0.000	0.053	0.000
Compressor	Other Construction Equipmen	2009	lb/hr	0.429	1.081	0.113	0.001	0.04709	0.000	0.043	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Demolition	Demolition	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
grading	grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Paving	Paving	2009	lb ROG / acre	0.000	0.000	2.620	0.000	0.000	0.000	0.000	0.000
Soil dumping	Soil dumping	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.016	0.000	0.003

SR103 8: Retaining Walls and Soundwalls

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.05590	0.000	0.051	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.05590	0.000	0.051	0.000
Haulers (Truck)	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.04139	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Vibratory Roller	Rollers	2009	lb/hr	0.427	0.817	0.125	0.001	0.05738	0.000	0.053	0.000
Compressor	Other Construction Equipmen	2009	lb/hr	0.429	1.081	0.113	0.001	0.04709	0.000	0.043	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.0004	0.000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Soil Loading	Soil Loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

Appendix F:

Table F5: Emission Factors (Segmental) - Alternative 2 (continued)

SR103 9: Striping, Lighting and Signing

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Boom	Other Construction Equipmen	2009	lb/hr	0.429	1.081	0.113	0.001	0.04709	0.000	0.043	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.05590	0.000	0.051	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.04139	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Compressor	Other Construction Equipmen	2009	lb/hr	0.429	1.081	0.113	0.001	0.04709	0.000	0.043	0.000
Striper (Truck)	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.09289	0.000	0.085	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

SHB and SR-103: Stockpile Area

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Stock piles	Stock piles	All	lb/acre/day	0.000	0.000	0.000	0.000	0.000	39.908	0.000	8.301

Note:

1. Stock pile areas were not specified or calculated for each construction phases. The maximum areas that might be covered each day by the whole project was used to calculate the total fugitive dust emissions from stock piles.
2. Detailed references of the emission factors are in Appendix I.

Appendix F:

Table F6: Daily Emissions (Segmental) - Alternative 2

SHB 1: Clearing, Grubbing & Earthwork

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
Pick Up	0.581	0.060	0.060	0.001	0.005	4.987	0.003	1.057
Haul Truck	2.016	2.237	0.279	0.003	0.081	3.989	0.069	0.846
Worker commute	1.550	0.161	0.159	0.002	0.014	0.000	0.009	0.000
Total	7.341	8.239	1.384	0.011	0.547	8.976	0.493	1.903

SHB 1: Clearing, Grubbing & Earthwork

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.1943	5.7812	0.8869	0.0062	0.4472	0.0000	0.4114	0.0000
Pick Up	0.5811	0.0603	0.0595	0.0006	0.0052	2.7427	0.0032	0.5814
Haul Truck	2.0161	2.2366	0.2789	0.0027	0.0805	2.1941	0.0692	0.4652
Worker commute	1.5497	0.1608	0.1588	0.0017	0.0138	0.0000	0.0086	0.0000
Total	7.3412	8.2390	1.3841	0.0112	0.5467	4.9368	0.4925	1.0466

SHB 2. Shaft and Columns - Drilled Shaft Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
200 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.998	0.000
Caisson Drill	4.160	9.830	0.929	0.014	0.432	0.000	0.398	0.000
200 ton gantry	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Concrete Truck	12.903	14.314	1.785	0.017	0.516	19.947	0.443	4.229
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Compressor	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.000	0.030	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.017	0.000	0.003
Soil loading	0.000	0.000	0.000	0.000	0.000	1.886	0.000	0.392
Total	75.716	159.393	18.161	0.182	6.626	73.710	6.036	15.619

SHB 2. Shaft and Columns - Drilled Shaft Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
200 ton crane	9.128	24.470	2.693	0.022	1.085	0.0000	0.9980	0.0000
Caisson Drill	4.160	9.830	0.929	0.014	0.432	0.0000	0.3979	0.0000
200 ton gantry	6.866	17.299	1.808	0.020	0.753	0.0000	0.6932	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.0000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.5824	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.9413	0.0162	4.6516
Concrete Truck	12.903	14.314	1.785	0.017	0.516	10.9707	0.4431	2.3258
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.0000	1.3674	0.0000
Compressor	6.866	17.299	1.808	0.020	0.753	0.0000	0.6932	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.0000	0.6837	0.0000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.0000	0.0302	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.0054	0.0000	0.0011
Soil loading	0.000	0.000	0.000	0.000	0.000	0.6034	0.0000	0.1255
Total	75.716	159.393	18.161	0.182	6.626	40.103	6.036	8.499

Appendix F:

Table F6: Daily Emissions (Segmental) - Alternative 2 (continued)

SHB 3. Shaft and Columns - Footing Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	6.287	10.796	1.633	0.012	0.833	0.000	0.766	0.000
200 ton crane	4.345	11.612	1.275	0.011	0.514	0.000	0.473	0.000
Generator	2.634	5.152	0.769	0.006	0.317	0.000	0.292	0.000
Haul Truck	7.375	8.250	1.036	0.011	0.300	15.957	0.257	3.383
Pick Up	1.239	0.138	0.137	0.002	0.013	19.947	0.008	4.229
Concrete Truck	14.160	15.840	1.989	0.021	0.577	23.936	0.493	5.074
Concrete Pump Truck	11.886	38.216	3.968	0.043	1.400	0.000	1.288	0.000
Compressor	3.287	8.094	0.845	0.010	0.353	0.000	0.325	0.000
Water Truck	5.943	19.108	1.984	0.021	0.700	0.000	0.644	0.000
Worker commute	2.314	0.257	0.256	0.003	0.024	0.000	0.015	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.036	0.000	0.007
Soil loading	0.000	0.000	0.000	0.000	0.000	1.176	0.000	0.245
Total	59.471	117.462	13.892	0.139	5.032	61.052	4.562	12.938

SHB 3. Shaft and Columns - Footing Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	6.287	10.796	1.633	0.012	0.833	0.0000	0.7662	0.0000
200 ton crane	4.345	11.612	1.275	0.011	0.514	0.0000	0.4726	0.0000
Generator	2.634	5.152	0.769	0.006	0.317	0.0000	0.2917	0.0000
Haul Truck	7.375	8.250	1.036	0.011	0.300	8.7765	0.2569	1.8606
Pick Up	1.239	0.138	0.137	0.002	0.013	10.9707	0.0082	2.3258
Concrete Truck	14.160	15.840	1.989	0.021	0.577	13.1648	0.4933	2.7909
Concrete Pump Truck	11.886	38.216	3.968	0.043	1.400	0.0000	1.2881	0.0000
Compressor	3.287	8.094	0.845	0.010	0.353	0.0000	0.3250	0.0000
Water Truck	5.943	19.108	1.984	0.021	0.700	0.0000	0.6441	0.0000
Worker commute	2.314	0.257	0.256	0.003	0.024	0.0000	0.0153	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.0115	0.0000	0.0024
Soil loading	0.000	0.000	0.000	0.000	0.000	0.3763	0.0000	0.0783
Total	59.471	117.462	13.892	0.139	5.032	33.300	4.562	7.058

SHB 4. Shaft and Columns - Column Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.305	0.000
Flatbed	1.512	1.677	0.209	0.002	0.060	5.984	0.052	1.269
Pick Up	1.453	0.151	0.149	0.002	0.013	19.947	0.008	4.229
Concrete Truck	5.161	5.726	0.714	0.007	0.206	7.979	0.177	1.691
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Compressor	3.433	8.650	0.904	0.010	0.377	0.000	0.347	0.000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.015	0.000
Total	34.227	74.903	8.572	0.083	3.040	33.909	2.770	7.189

SHB 4. Shaft and Columns - Column Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.3046	0.0000
Flatbed	1.512	1.677	0.209	0.002	0.060	3.291	0.0519	0.6977
Pick Up	1.453	0.151	0.149	0.002	0.013	10.971	0.0081	2.3258
Concrete Truck	5.161	5.726	0.714	0.007	0.206	4.388	0.1772	0.9303
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.3674	0.0000
Compressor	3.433	8.650	0.904	0.010	0.377	0.000	0.3466	0.0000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.0151	0.0000
Total	34.227	74.903	8.572	0.083	3.040	18.650	2.770	3.954

Appendix F:

Table F6: Daily Emissions (Segmental)- Alternative 2 (continued)

SHB 5. Superstructure - Approach Span Erection

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Rough Terrain (f-lift)	7.704	13.608	2.188	0.013	1.150	0.000	1.058	0.000
200 ton gantry	3.433	8.650	0.904	0.010	0.377	0.000	0.347	0.000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.219	0.000
Semi Truck	5.385	17.575	1.383	0.017	0.838	37.222	0.736	7.891
Flatbed	9.072	10.065	1.255	0.012	0.362	35.904	0.312	7.612
Pick Up	7.264	0.754	0.744	0.008	0.065	99.733	0.040	21.143
Concrete Truck	12.903	14.314	1.785	0.017	0.516	19.947	0.443	4.229
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Compressor	13.732	34.599	3.617	0.041	1.507	0.000	1.386	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.891	0.000	0.185
Grading	0.000	0.000	0.000	0.000	0.000	2.640	0.000	0.549
Soil loading	0.000	0.000	0.000	0.000	0.000	3.120	0.000	0.649
Total	93.370	174.710	21.238	0.200	8.219	199.457	7.439	42.258

SHB 5. Superstructure - Approach Span Erection

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Rough Terrain (f-lift)	7.704	13.608	2.188	0.013	1.150	0.000	1.0576	0.0000
200 ton gantry	3.433	8.650	0.904	0.010	0.377	0.000	0.3466	0.0000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.2185	0.0000
Semi Truck	5.385	17.575	1.383	0.017	0.838	20.472	0.7360	4.3401
Flatbed	9.072	10.065	1.255	0.012	0.362	19.747	0.3115	4.1864
Pick Up	7.264	0.754	0.744	0.008	0.065	54.853	0.0404	11.6289
Concrete Truck	12.903	14.314	1.785	0.017	0.516	10.971	0.4431	2.3258
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.3674	0.0000
Compressor	13.732	34.599	3.617	0.041	1.507	0.000	1.3863	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.0323	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.285	0.0000	0.0593
Grading	0.000	0.000	0.000	0.000	0.000	0.845	0.0000	0.1757
Soil loading	0.000	0.000	0.000	0.000	0.000	0.998	0.0000	0.2077
Total	93.370	174.710	21.238	0.200	8.219	108.172	7.439	22.924

Table F6: Daily Emissions (Segmental) - Alternative 2 (continued)

SHB 6. Superstructure - Main Span Erection

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
400 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.998	0.000
Rough Terrain (f-lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.115	0.000
200 ton gantry	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Generator	8.108	16.124	2.448	0.017	0.993	0.000	0.914	0.000
Semi Truck	10.771	35.151	2.766	0.034	1.676	74.444	1.472	15.782
Flatbed	9.072	10.065	1.255	0.012	0.362	35.904	0.312	7.612
Pick Up	7.264	0.754	0.744	0.008	0.065	99.733	0.040	21.143
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.995	0.044	0.423
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	10.299	25.949	2.713	0.030	1.130	0.000	1.040	0.000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.081	0.000	0.017
Grading	0.000	0.000	0.000	0.000	0.000	1.320	0.000	0.275
Soil loading	0.000	0.000	0.000	0.000	0.000	0.085	0.000	0.018
Total	96.753	191.028	23.430	0.211	10.105	213.561	9.167	45.269

SHB 6. Superstructure - Main Span Erection

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
400 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.9980	0.0000
Rough Terrain (f-lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.1153	0.0000
200 ton gantry	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Generator	8.108	16.124	2.448	0.017	0.993	0.000	0.9139	0.0000
Semi Truck	10.771	35.151	2.766	0.034	1.676	40.944	1.4719	8.6801
Flatbed	9.072	10.065	1.255	0.012	0.362	19.747	0.3115	4.1864
Pick Up	7.264	0.754	0.744	0.008	0.065	54.853	0.0404	11.6289
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.097	0.0443	0.2326
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	10.299	25.949	2.713	0.030	1.130	0.000	1.0397	0.0000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.0323	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.026	0.0000	0.0054
Grading	0.000	0.000	0.000	0.000	0.000	0.422	0.0000	0.0879
Soil loading	0.000	0.000	0.000	0.000	0.000	0.027	0.0000	0.0057
Total	96.753	191.028	23.430	0.211	10.105	117.117	9.167	24.827

Appendix F:

SHB 7. Bridge Demolition (including both approaches)

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	4.359	0.452	0.447	0.005	0.039	59.840	0.024	12.686
Haul Truck	20.161	22.366	2.789	0.027	0.805	39.893	0.692	8.457
Compressor	13.732	34.599	3.617	0.041	1.507	0.000	1.386	0.000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.219	0.000
Flatbed	6.048	6.710	0.837	0.008	0.242	23.936	0.208	5.074
Backhoe/excavator	12.777	23.125	3.547	0.025	1.789	0.000	1.646	0.000
Loader	9.583	17.344	2.661	0.019	1.342	0.000	1.234	0.000
Worker commute	6.199	0.643	0.635	0.007	0.055	0.000	0.034	0.000
Demolition	0.000	0.000	0.000	0.000	0.000	0.164	0.000	0.034
Excavation	0.000	0.000	0.000	0.000	0.000	0.282	0.000	0.059
Grading	0.000	0.000	0.000	0.000	0.000	2.640	0.000	0.549
Soil loading	0.000	0.000	0.000	0.000	0.000	0.592	0.000	0.123
						0.000	0.000	0.000
Total	83.670	126.738	17.797	0.153	7.103	127.348	6.444	26.983

SHB 7. Bridge Demolition (including both approaches)

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	4.359	0.452	0.447	0.005	0.039	32.912	0.0242	6.9773
Haul Truck	20.161	22.366	2.789	0.027	0.805	21.941	0.6923	4.6516
Compressor	13.732	34.599	3.617	0.041	1.507	0.000	1.3863	0.0000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.2185	0.0000
Flatbed	6.048	6.710	0.837	0.008	0.242	13.165	0.2077	2.7909
Backhoe/excavator	12.777	23.125	3.547	0.025	1.789	0.000	1.6457	0.0000
Loader	9.583	17.344	2.661	0.019	1.342	0.000	1.2343	0.0000
Worker commute	6.199	0.643	0.635	0.007	0.055	0.000	0.0345	0.0000
Demolition	0.000	0.000	0.000	0.000	0.000	0.053	0.0000	0.0109
Excavation	0.000	0.000	0.000	0.000	0.000	0.090	0.0000	0.0188
Grading	0.000	0.000	0.000	0.000	0.000	0.845	0.0000	0.1757
Soil loading	0.000	0.000	0.000	0.000	0.000	0.190	0.0000	0.0394
Total	83.670	126.738	17.797	0.153	7.103	69.195	6.444	14.665

SHB 8. Barriers and Joints

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Concrete Trucks	1.008	1.118	0.139	0.001	0.040	5.984	0.035	1.269
Flatbed Truck	2.581	2.863	0.357	0.003	0.103	3.989	0.089	0.846
Pick Up	0.387	0.040	0.040	0.000	0.003	3.989	0.002	0.846
Semi Truck	0.539	1.758	0.138	0.002	0.084	3.722	0.074	0.789
Worker commute	2.325	0.241	0.238	0.003	0.021	0.000	0.013	0.000
Total	6.839	6.020	0.913	0.009	0.251	17.685	0.212	3.749

SHB 8. Barriers and Joints

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Concrete Trucks	1.008	1.118	0.139	0.001	0.040	3.291	0.0346	0.6977
Flatbed Truck	2.581	2.863	0.357	0.003	0.103	2.194	0.0886	0.4652
Pick Up	0.387	0.040	0.040	0.000	0.003	2.194	0.0022	0.4652
Semi Truck	0.539	1.758	0.138	0.002	0.084	2.047	0.0736	0.4340
Worker commute	2.325	0.241	0.238	0.003	0.021	0.000	0.0129	0.0000
Total	6.839	6.020	0.913	0.009	0.251	9.727	0.212	2.062

SHB 9. Stripping, Lighting, and Signing

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Paint truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	3.433	8.650	0.904	0.010	0.377	0.000	0.347	0.000
Bucket Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Semi Truck	1.077	3.515	0.277	0.003	0.168	7.444	0.147	1.578
Boom Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	3.874	0.402	0.397	0.004	0.034	0.000	0.022	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.247	0.000	0.051
Total	36.668	94.485	10.185	0.106	3.577	47.585	3.266	10.087

SHB 9. Stripping, Lighting, and Signing

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Paint truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	3.433	8.650	0.904	0.010	0.377	0.000	0.3466	0.0000
Bucket Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.3674	0.0000
Semi Truck	1.077	3.515	0.277	0.003	0.168	4.094	0.1472	0.8680
Boom Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Worker commute	3.874	0.402	0.397	0.004	0.034	0.000	0.0215	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.079	0.0000	0.0165
Total	36.668	94.485	10.185	0.106	3.577	26.115	3.266	5.536

Appendix F:

Table F6: Daily Emissions (Segmental) - Alternative 2 (continued)

SR-103 1. Site Preparation - Earthwork

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Haulers (Truck)	12.096	13.420	1.673	0.016	0.483	23.936	0.415	5.074
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	4.359	0.452	0.447	0.005	0.039	59.840	0.024	12.686
Grader	10.285	24.380	2.920	0.024	1.273	0.000	1.171	0.000
Vibratory loader	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Asphalt Paver	4.605	8.257	1.494	0.007	0.591	0.000	0.544	0.000
Compressor	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Total	77.963	133.607	18.387	0.152	7.401	95.744	6.746	20.298

SR-103 1. Site Preparation - Earthwork

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Haulers (Truck)	12.096	13.420	1.673	0.016	0.483	13.165	0.4154	2.7909
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	4.359	0.452	0.447	0.005	0.039	32.912	0.0242	6.9773
Grader	10.285	24.380	2.920	0.024	1.273	0.000	1.1714	0.0000
Vibratory loader	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Asphalt Paver	4.605	8.257	1.494	0.007	0.591	0.000	0.5437	0.0000
Compressor	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.0323	0.0000
Total	77.963	133.607	18.387	0.152	7.401	52.659	6.746	11.164

SR-103 2. Site Preparation - Drilled Shaft Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
200 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Caisson Drill	4.160	9.830	0.929	0.014	0.432	0.000	0.398	0.000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Concrete Truck	6.451	7.157	0.892	0.009	0.258	9.973	0.222	2.114
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	3.433	8.650	0.904	0.010	0.377	0.000	0.347	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.000	0.030	0.000
Demolition	0.000	0.000	0.000	0.000	0.000	0.207	0.000	0.043
Excavation	0.000	0.000	0.000	0.000	0.000	0.248	0.000	0.052
Grading	0.000	0.000	0.000	0.000	0.000	2.640	0.000	0.549
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.181	0.000	0.038
Total	52.621	105.883	12.478	0.122	4.495	65.110	4.091	13.790

SR-103 2. Site Preparation - Drilled Shaft Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
200 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Caisson Drill	4.160	9.830	0.929	0.014	0.432	0.000	0.3979	0.0000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Concrete Truck	6.451	7.157	0.892	0.009	0.258	5.485	0.2215	1.1629
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	3.433	8.650	0.904	0.010	0.377	0.000	0.3466	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.000	0.0302	0.0000
Demolition	0.000	0.000	0.000	0.000	0.000	0.066	0.0000	0.0138
Excavation	0.000	0.000	0.000	0.000	0.000	0.079	0.0000	0.0165
Grading	0.000	0.000	0.000	0.000	0.000	0.845	0.0000	0.1757
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.058	0.0000	0.0120
Total	52.621	105.883	12.478	0.122	4.495	35.057	4.091	7.428

Appendix F:

Table F6: Daily Emissions (Segmental) - Alternative 2 (continued)

SR103 3: Foundation Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.305	0.000
Haul Truck	8.064	8.947	1.116	0.011	0.322	15.957	0.277	3.383
Pick Up	2.179	0.226	0.223	0.002	0.019	29.920	0.012	6.343
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.995	0.044	0.423
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	3.433	8.650	0.904	0.010	0.377	0.000	0.347	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Pile Driver	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.015	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.034	0.000	0.007
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.024	0.000	0.005
Total	47.695	101.033	11.712	0.114	4.354	47.930	3.971	10.161

SR103 3: Foundation Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.194	5.781	0.887	0.006	0.447	0.000	0.4114	0.0000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.3046	0.0000
Haul Truck	8.064	8.947	1.116	0.011	0.322	8.777	0.2769	1.8606
Pick Up	2.179	0.226	0.223	0.002	0.019	16.456	0.0121	3.4887
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.097	0.0443	0.2326
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	3.433	8.650	0.904	0.010	0.377	0.000	0.3466	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Pile Driver	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.0151	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.011	0.0000	0.0023
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.008	0.0000	0.0016
Total	47.695	101.033	11.712	0.114	4.354	26.348	3.971	5.586

SR103 4: Column Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.305	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Concrete Truck	2.581	2.863	0.357	0.003	0.103	3.989	0.089	0.846
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	3.433	8.650	0.904	0.010	0.377	0.000	0.347	0.000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.015	0.000
Total	28.267	53.464	6.495	0.062	2.267	55.851	2.058	11.840

SR103 4: Column Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.3046	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Concrete Truck	2.581	2.863	0.357	0.003	0.103	2.194	0.0886	0.4652
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	3.433	8.650	0.904	0.010	0.377	0.000	0.3466	0.0000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.0151	0.0000
Total	28.267	53.464	6.495	0.062	2.267	30.718	2.058	6.512

Appendix F:

Table F6: Daily Emissions (Segmental) - Alternative 2 (continued)

SR103 5: Falsework

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
100 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Rough Terrain (f - lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.115	0.000
Scissor Lift	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Compressor	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Boom	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Total	57.718	106.358	14.093	0.123	5.962	51.861	5.455	10.995

SR103 5: Falsework

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
100 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Rough Terrain (f - lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.1153	0.0000
Scissor Lift	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Compressor	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Boom	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.0323	0.0000
Total	57.718	106.358	14.093	0.123	5.962	28.524	5.455	6.047

SR103 6: Superstructure - Span Erection

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Rough Terrain (f-lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.115	0.000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.219	0.000
Semi Truck	2.154	7.030	0.553	0.007	0.335	14.889	0.294	3.156
Flatbed	6.048	6.710	0.837	0.008	0.242	23.936	0.208	5.074
Pick Up	7.264	0.754	0.744	0.008	0.065	99.733	0.040	21.143
Concrete Truck	15.483	17.177	2.142	0.021	0.619	23.936	0.532	5.074
Concrete Pump Truck	25.378	81.616	8.310	0.085	2.973	0.000	2.735	0.000
Compressor	13.732	34.599	3.617	0.041	1.507	0.000	1.386	0.000
Worker commute	9.686	1.005	0.992	0.011	0.086	0.000	0.054	0.000
Demolition	0.000	0.000	0.000	0.000	0.000	5.040	0.000	1.048
Excavation	0.000	0.000	0.000	0.000	0.000	0.504	0.000	0.105
grading	0.000	0.000	0.000	0.000	0.000	7.920	0.000	1.647
paving	0.000	0.000	0.393	0.000	0.000	0.000	0.000	0.000
Total	115.094	222.076	27.923	0.250	10.534	175.958	9.581	37.249

SR103 6: Superstructure - Span Erection

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Rough Terrain (f-lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.1153	0.0000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.2185	0.0000
Semi Truck	2.154	7.030	0.553	0.007	0.335	8.189	0.2944	1.7360
Flatbed	6.048	6.710	0.837	0.008	0.242	13.165	0.2077	2.7909
Pick Up	7.264	0.754	0.744	0.008	0.065	54.853	0.0404	11.6289
Concrete Truck	15.483	17.177	2.142	0.021	0.619	13.165	0.5317	2.7909
Concrete Pump Truck	25.378	81.616	8.310	0.085	2.973	0.000	2.7348	0.0000
Compressor	13.732	34.599	3.617	0.041	1.507	0.000	1.3863	0.0000
Worker commute	9.686	1.005	0.992	0.011	0.086	0.000	0.0538	0.0000
Demolition	0.000	0.000	0.000	0.000	0.000	1.613	0.0000	0.3355
Excavation	0.000	0.000	0.000	0.000	0.000	0.161	0.0000	0.0335
grading	0.000	0.000	0.000	0.000	0.000	2.534	0.0000	0.5272
paving	0.000	0.000	0.393	0.000	0.000	0.000	0.0000	0.0000
Total	115.094	222.076	27.923	0.250	10.534	93.680	9.581	19.843

Appendix F:

Table F6: Daily Emissions (Segmental) - Alternative 2 (continued)

SR103 7: Drainage
Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
Loader	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
Haulers (Truck)	4.032	4.473	0.558	0.005	0.161	7.979	0.138	1.691
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	6.048	6.710	0.837	0.008	0.242	23.936	0.208	5.074
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Vibratory Roller	6.836	13.065	2.000	0.012	0.918	0.000	0.845	0.000
Compressor	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.995	0.044	0.423
Worker commute	4.649	0.482	0.476	0.005	0.041	0.000	0.026	0.000
Demolition	0.000	0.000	0.000	0.000	0.000	0.277	0.000	0.058
Excavation	0.000	0.000	0.000	0.000	0.000	0.259	0.000	0.054
grading	0.000	0.000	0.000	0.000	0.000	2.640	0.000	0.549
Paving	0.000	0.000	0.175	0.000	0.000	0.000	0.000	0.000
Soil dumping	0.000	0.000	0.000	0.000	0.000	0.008	0.000	0.002
Total	50.766	86.479	11.814	0.101	4.493	76.987	4.086	16.308

SR103 7: Drainage
Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	3.194	5.781	0.887	0.006	0.447	0.000	0.4114	0.0000
Loader	3.194	5.781	0.887	0.006	0.447	0.000	0.4114	0.0000
Haulers (Truck)	4.032	4.473	0.558	0.005	0.161	4.388	0.1385	0.9303
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Flatbed	6.048	6.710	0.837	0.008	0.242	13.165	0.2077	2.7909
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Vibratory Roller	6.836	13.065	2.000	0.012	0.918	0.000	0.8446	0.0000
Compressor	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.097	0.0443	0.2326
Worker commute	4.649	0.482	0.476	0.005	0.041	0.000	0.0258	0.0000
Demolition	0.000	0.000	0.000	0.000	0.000	0.089	0.0000	0.0185
Excavation	0.000	0.000	0.000	0.000	0.000	0.083	0.0000	0.0172
grading	0.000	0.000	0.000	0.000	0.000	0.845	0.0000	0.1757
Paving	0.000	0.000	0.175	0.000	0.000	0.000	0.0000	0.0000
Soil dumping	0.000	0.000	0.000	0.000	0.000	0.003	0.0000	0.0005
Total	50.766	86.479	11.814	0.101	4.493	41.610	4.086	8.817

SR103 8: Retaining Walls and Soundwalls
Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Haulers (Truck)	8.064	8.947	1.116	0.011	0.322	15.957	0.277	3.383
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.305	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	1.453	0.151	0.149	0.002	0.013	19.947	0.008	4.229
Vibratory Roller	6.836	13.065	2.000	0.012	0.918	0.000	0.845	0.000
Compressor	3.433	8.650	0.904	0.010	0.377	0.000	0.347	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Concrete Truck	2.581	2.863	0.357	0.003	0.103	3.989	0.089	0.846
Worker commute	4.262	0.442	0.437	0.005	0.038	0.000	0.024	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	1.050	0.000	0.218
Grading	0.000	0.000	0.000	0.000	0.000	5.280	0.000	1.098
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.919	0.000	0.191
Total	51.477	86.376	11.822	0.099	4.755	59.110	4.326	12.502

SR103 8: Retaining Walls and Soundwalls
Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Haulers (Truck)	8.064	8.947	1.116	0.011	0.322	8.777	0.2769	1.8606
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.3046	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	1.453	0.151	0.149	0.002	0.013	10.971	0.0081	2.3258
Vibratory Roller	6.836	13.065	2.000	0.012	0.918	0.000	0.8446	0.0000
Compressor	3.433	8.650	0.904	0.010	0.377	0.000	0.3466	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Concrete Truck	2.581	2.863	0.357	0.003	0.103	2.194	0.0886	0.4652
Worker commute	4.262	0.442	0.437	0.005	0.038	0.000	0.0237	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.336	0.0000	0.0699
Grading	0.000	0.000	0.000	0.000	0.000	1.690	0.0000	0.3514
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.294	0.0000	0.0612
Total	51.477	86.376	11.822	0.099	4.755	30.843	4.326	6.530

Appendix F:

Table F6: Daily Emissions (Segmental) - Alternative 2 (continued)

SR103 9: Striping, Lighting and Signing
Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Boom	13.732	34.599	3.617	0.041	1.507	0.000	1.386	0.000
Loader	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
Generator	8.108	16.124	2.448	0.017	0.993	0.000	0.914	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	4.359	0.452	0.447	0.005	0.039	59.840	0.024	12.686
Compressor	10.299	25.949	2.713	0.030	1.130	0.000	1.040	0.000
Striper (Truck)	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.000	0.030	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.412	0.000	0.086
Total	54.485	107.227	13.163	0.130	5.028	72.220	4.593	15.309

SR103 9: Striping, Lighting and Signing
Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Boom	13.732	34.599	3.617	0.041	1.507	0.000	1.3863	0.0000
Loader	3.194	5.781	0.887	0.006	0.447	0.000	0.4114	0.0000
Generator	8.108	16.124	2.448	0.017	0.993	0.000	0.9139	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	4.359	0.452	0.447	0.005	0.039	32.912	0.0242	6.9773
Compressor	10.299	25.949	2.713	0.030	1.130	0.000	1.0397	0.0000
Striper (Truck)	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.000	0.0302	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.132	0.0000	0.0274
Total	54.485	107.227	13.163	0.130	5.028	39.626	4.593	8.400

SHB and SR-103: Stockpile Area
Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Stock piles	0.000	0.000	0.000	0.000	0.000	79.8	0.0	16.6

SHB and SR-103: Stockpile Area
Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

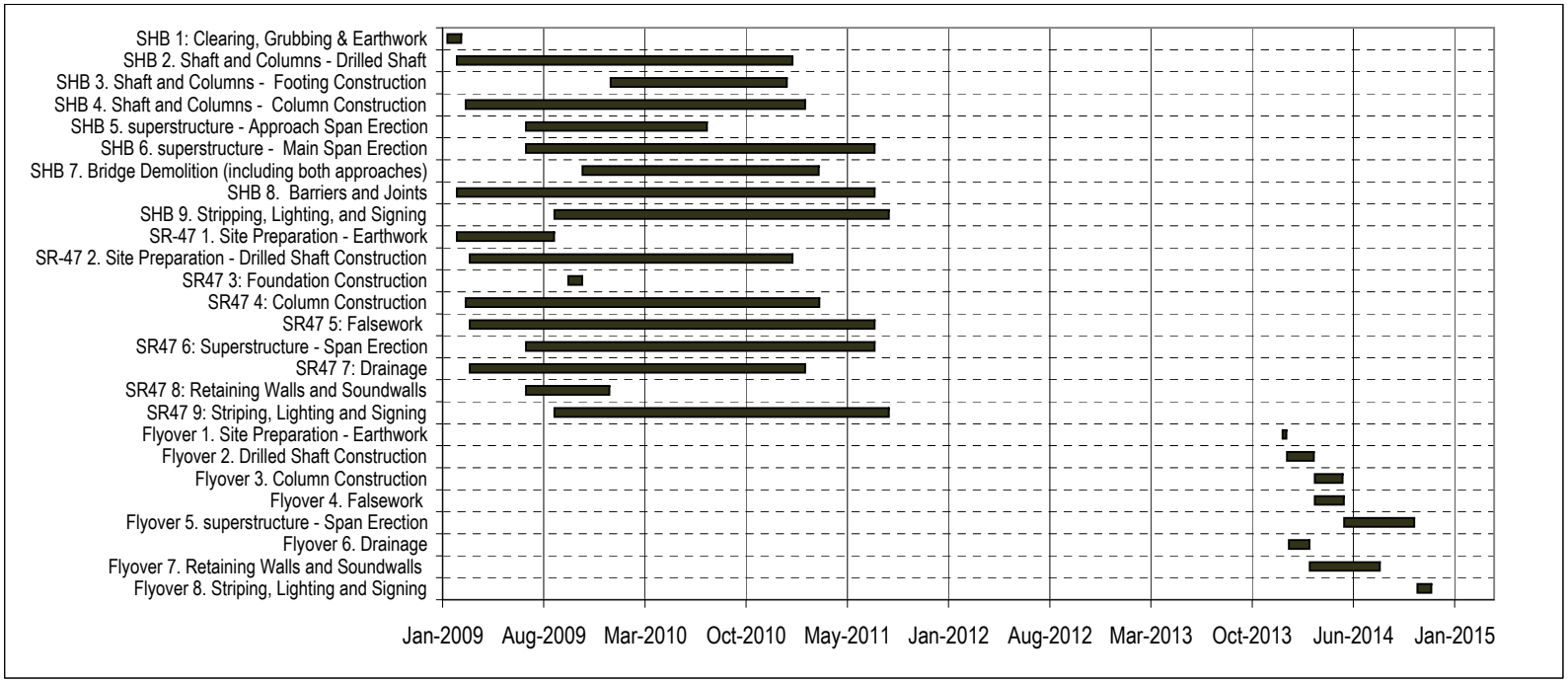
	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Stock piles	0.000	0.000	0.000	0.000	0.000	25.541	0.0000	5.3125

Note: Stock pile areas were not specified or calculated for each construction phases. The maximum areas that might be covered each day by the whole project was used to calculate the total fugitive dust emissions from stock piles.

Appendix G
Construction Emission Calculations – Alternative 3, Segmental Method

Appendix G:

Table G1: Construction Schedule (Segmental) - Alternative 3



Source: DMJM Harris, May 2005 and January 2007

Appendix G:

Table G2: Maximum Construction Emissions (Segmental): By Source - Alternative 3

Maximum Daily Construction Emissions

		CO (lb/day)	NOx (lb/day)	ROG (lb/day)	SOx (lb/day)	PM_{10} (lb/day)	PM_{10} (lb/day)
With Watering to Control Fugitive Dust	Maximum Construction Equipment Exhaust	755	1528	192	1.6	77	70
	Maximum Workers Commute	69	7.2	7.1	0.08	0.62	0.39
	Maximum Fugitive Dust	NA	NA	NA	NA	706	150
	Maximum Combined Daily Emissions	**824**	**1535**	**199**	**1.7**	**784**	**220**
SCAQMD Thresholds		550	100	75	150	150	55
Exceeding Thresholds?		YES	YES	YES	NO	YES	YES

Note: The maximum daily emissions from equipment exhaust, fugitive dust, and workers commute are not additive because these worst case emissions do not always occur on the same day.

Appendix G
Table G3. Summary of Daily Emissions - (Segmental): Alternative 3

		Total Emissions without Watering (lb/day)									
Construction Phases		**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**PM_{10} Fugitive**	**PM_{10} Total**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ Fugitive**	**$PM_{2.5}$ Total**
1	SHB 1: Clearing, Grubbing & Earthwork	7.34	8.24	1.38	0.01	0.55	8.98	9.52	0.49	1.90	2.40
2	SHB 2. Shaft and Columns - Drilled Shaft Construction	74.77	154.36	18.24	0.17	6.75	73.71	80.46	6.15	15.62	21.77
3	SHB 3. Shaft and Columns - Footing Construction	59.07	115.22	13.94	0.13	5.10	61.05	66.15	4.62	12.94	17.56
4	SHB 4. Shaft and Columns - Column Construction	33.75	72.38	8.61	0.08	3.10	33.91	37.01	2.83	7.19	10.01
5	SHB 5. Superstructure - Approach Span Erection	91.47	164.64	21.40	0.18	8.46	199.46	207.92	7.66	42.26	49.92
6	SHB 6. Superstructure - Main Span Erection	95.33	183.47	23.55	0.20	10.29	213.56	223.85	9.33	45.27	54.60
7	SHB 7. Bridge Demolition (including both approaches)	81.77	116.66	17.95	0.13	7.34	127.35	134.69	6.67	26.98	33.65
8	SHB 8. Barriers and Joints	7.51	5.89	0.97	0.01	0.25	17.68	17.94	0.21	3.75	3.96
9	SHB 9. Stripping, Lighting, and Signing	36.19	91.97	10.22	0.10	3.64	47.59	51.22	3.32	10.09	13.41
10	SR-47 1. Site Preparation - Earthwork	71.53	123.95	17.76	0.14	7.35	67.82	75.17	6.71	14.38	21.09
11	SR-47 2. Site Preparation - Drilled Shaft Construction	52.15	103.36	12.52	0.12	4.56	64.77	69.32	4.15	13.72	17.87
12	SR47 3: Foundation Construction	64.44	137.71	16.73	0.15	6.43	59.90	66.33	5.88	12.70	18.57
13	SR47 4: Column Construction	27.79	50.95	6.53	0.06	2.33	55.85	58.18	2.11	11.84	13.95
14	SR47 5: Falsework	56.77	101.32	14.17	0.11	6.08	51.86	57.94	5.57	10.99	16.56
15	SR47 6: Superstructure - Span Erection	113.20	212.00	28.08	0.23	10.78	175.96	186.73	9.80	37.25	47.05
16	SR47 7: Drainage	49.82	81.44	11.89	0.09	4.61	76.99	81.60	4.20	16.31	20.51
17	SR47 8: Retaining Walls and Soundwalls	55.37	93.93	13.44	0.10	5.53	57.12	62.65	5.04	12.08	17.12
18	SR47 9: Striping, Lighting and Signing	44.49	81.46	11.20	0.09	4.34	52.27	56.61	3.96	11.08	15.04
20	Flyover 1. Site Preparation - Earthwork	11.34	18.12	2.59	0.03	0.80	9.97	10.77	0.72	2.11	2.84
21	Flyover 2. Drilled Shaft Construction	43.65	72.98	9.52	0.13	3.19	29.96	33.16	2.89	6.35	9.24
22	Flyover 3. Column Construction	27.39	45.09	6.25	0.07	2.21	21.94	24.15	2.00	4.65	6.65
23	Flyover 4. Falsework	59.33	102.79	14.11	0.15	5.63	15.96	21.58	5.16	3.38	8.54
24	Flyover 5. superstructure - Span Erection	72.36	117.94	16.14	0.18	6.28	57.51	63.79	5.69	12.19	17.88
25	Flyover 6. Drainage	25.44	41.89	5.95	0.06	2.30	7.38	9.67	2.10	1.56	3.65
26	Flyover 7. Retaining Walls and Soundwalls	62.50	84.94	12.27	0.14	4.72	35.60	40.33	4.26	7.52	11.77
27	Flyover 8. Striping, Lighting and Signing	15.50	26.74	3.74	0.04	1.34	0.11	1.46	1.23	0.02	1.25
	SHB SR47 Stock Piles (entire project)	0.00	0.00	0.00	0.00	0.00	79.82	79.82	0.00	16.60	16.60
	Overlapping phases										
	2,4,8,10,11,13,14,16	374	694	91	0.78	35	522	557	32	110	142
	2,4,5,6,8,10,11,13,14,15,16,17	729	1348	177	1.49	70	1168	1239	64	247	311
	2,4,5,6,8,9,11,12,13,14,15,16,17,18	803	1535	198	1.70	77	1260	1338	70	267	337
	2,3,4,5,6,7,8,9,11,13,14,15,16,18	824	1535	199	1.72	78	1332	1409	71	282	352
	2,3,4,6,7,8,9,11,13,14,15,16,18	733	1370	178	1.54	69	1132	1202	63	240	303
	20	15	28	3.6	0.03	1.2	90	91	1.1	19	20
	21,25	67	113	15	0.20	5.3	117	122	4.9	25	29
	22,23,26	143	229	32	0.38	12	153	165	11	32	43
	27	15	27	4	0.04	1.3	80	81	1.2	17	18
	Max. Daily Emissions	**824**	**1535**	**199**	**1.7**	**78**	**1332**	**1409**	**71**	**282**	**352**

Note:
1. Based on the construction schedule, emissions from overlapping construction phases were added together to evaluate the worst case scenarios. The maximum daily emissions represent the scenario of overlapping phases with the highest emissions.
2. Fugitive dust emissions from stock piles were not calculated for each construction phase. The emissions were calculated separately based on a maximum area that the stock piles will cover during the entire construction duration.
3. The fugitive dusts were assumed to be controlled by 68% by watering the site 3 times per day, and 45% by watering the unpaved roads 3 times a day, according to the control efficiencies in SCAQMD CEQA Air Quality Handbook Table 11-4.

Appendix G
Table G3. Summary of Daily Emissions - (Segmental): A

		Total Emissions with Watering (lb/day)									
Construction Phases		**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**PM_{10} Fugitive**	**PM_{10} Total**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ Fugitive**	**$PM_{2.5}$ Total**
1	SHB 1: Clearing, Grubbing & Earthwork	7.34	8.24	1.38	0.01	0.55	4.94	5.48	0.49	1.05	1.54
2	SHB 2. Shaft and Columns - Drilled Shaft Construction	74.77	154.36	18.24	0.17	6.75	40.10	46.85	6.15	8.50	14.65
3	SHB 3. Shaft and Columns - Footing Construction	59.07	115.22	13.94	0.13	5.10	33.30	38.40	4.62	7.06	11.68
4	SHB 4. Shaft and Columns - Column Construction	33.75	72.38	8.61	0.08	3.10	18.65	21.75	2.83	3.95	6.78
5	SHB 5. Superstructure - Approach Span Erection	91.47	164.64	21.40	0.18	8.46	108.17	116.63	7.66	22.92	30.59
6	SHB 6. Superstructure - Main Span Erection	95.33	183.47	23.55	0.20	10.29	117.12	127.40	9.33	24.83	34.16
7	SHB 7. Bridge Demolition (including both approaches)	81.77	116.66	17.95	0.13	7.34	69.20	76.54	6.67	14.66	21.33
8	SHB 8. Barriers and Joints	7.51	5.89	0.97	0.01	0.25	9.73	9.98	0.21	2.06	2.27
9	SHB 9. Stripping, Lighting, and Signing	36.19	91.97	10.22	0.10	3.64	26.11	29.75	3.32	5.54	8.86
10	SR-47 1. Site Preparation - Earthwork	71.53	123.95	17.76	0.14	7.35	37.30	44.65	6.71	7.91	14.62
11	SR-47 2. Site Preparation - Drilled Shaft Construction	52.15	103.36	12.52	0.12	4.56	34.95	39.50	4.15	7.41	11.55
12	SR47 3: Foundation Construction	64.44	137.71	16.73	0.15	6.43	32.93	39.36	5.88	6.98	12.86
13	SR47 4: Column Construction	27.79	50.95	6.53	0.06	2.33	30.72	33.05	2.11	6.51	8.63
14	SR47 5: Falsework	56.77	101.32	14.17	0.11	6.08	28.52	34.61	5.57	6.05	11.61
15	SR47 6: Superstructure - Span Erection	113.20	212.00	28.08	0.23	10.78	93.68	104.46	9.80	19.84	29.65
16	SR47 7: Drainage	49.82	81.44	11.89	0.09	4.61	41.61	46.22	4.20	8.82	13.01
17	SR47 8: Retaining Walls and Soundwalls	55.37	93.93	13.44	0.10	5.53	29.75	35.28	5.04	6.30	11.34
18	SR47 9: Striping, Lighting and Signing	44.49	81.46	11.20	0.09	4.34	28.66	32.99	3.96	6.07	10.04
20	Flyover 1. Site Preparation - Earthwork	11.34	18.12	2.59	0.03	0.80	5.49	6.28	0.72	1.16	1.88
21	Flyover 2. Drilled Shaft Construction	43.65	72.98	9.52	0.13	3.19	16.24	19.43	2.89	3.44	6.33
22	Flyover 3. Column Construction	27.39	45.09	6.25	0.07	2.21	12.07	14.27	2.00	2.56	4.55
23	Flyover 4. Falsework	59.33	102.79	14.11	0.15	5.63	8.78	14.40	5.16	1.86	7.02
24	Flyover 5. superstructure - Span Erection	72.36	117.94	16.14	0.18	6.28	31.63	37.91	5.69	6.71	12.40
25	Flyover 6. Drainage	25.44	41.89	5.95	0.06	2.30	3.59	5.88	2.10	0.76	2.85
26	Flyover 7. Retaining Walls and Soundwalls	62.50	84.94	12.27	0.14	4.72	17.70	22.43	4.26	3.74	8.00
27	Flyover 8. Striping, Lighting and Signing	15.50	26.74	3.74	0.04	1.34	0.04	1.38	1.23	0.01	1.23
	SHB SR47 Stock Piles (entire project)	0.00	0.00	0.00	0.00	0.00	25.54	25.54	0.00	5.31	5.31
	Overlapping phases										
	2,4,8,10,11,13,14,16	374	694	91	0.8	35	267	302	32	57	88
	2,4,5,6,8,10,11,13,14,15,16,17	729	1348	177	1.5	70	616	686	64	130	194
	2,4,5,6,8,9,11,12,13,14,15,16,17,18	803	1535	198	1.7	77	666	743	70	141	211
	2,3,4,5,6,7,8,9,11,13,14,15,16,18	824	1535	199	1.7	78	706	784	71	150	220
	2,3,4,6,7,8,9,11,13,14,15,16,18	733	1370	178	1.5	69	598	667	63	127	190
	20	15	28	4	0.03	1.24	31	32	1.1	6	8
	21,25	67	113	15	0.20	5.29	45	51	4.9	10	14
	22,23,26	143	229	32	0.38	12.07	64	76	11.1	13	25
	27	15	27	4	0.04	1.33	26	27	1.2	5	7
	Max. Daily Emissions	**824**	**1535**	**199**	**1.7**	**78**	**706**	**784**	**71**	**150**	**220**

Appendix G
Table G3. Summary of Daily Emissions - (Segmental): A

		Construction Equipment Exhaust (lb/day)						Workers Commute (lb/day)					
Construction Phases		**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**$PM_{2.5}$ Exhaust**	**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**$PM_{2.5}$ Exhaust**
1	SHB 1: Clearing, Grubbing & Earthwork	5.79	8.08	1.23	0.01	0.53	0.48	1.550	0.161	0.159	0.002	0.014	0.009
2	SHB 2. Shaft and Columns - Drilled Shaft Construction	69.34	153.79	17.68	0.17	6.70	6.12	5.424	0.563	0.556	0.006	0.048	0.030
3	SHB 3. Shaft and Columns - Footing Construction	56.76	114.97	13.69	0.13	5.08	4.61	2.314	0.257	0.256	0.003	0.024	0.015
4	SHB 4. Shaft and Columns - Column Construction	31.04	72.10	8.33	0.08	3.08	2.81	2.712	0.281	0.278	0.003	0.024	0.015
5	SHB 5. Superstructure - Approach Span Erection	85.66	164.03	20.80	0.18	8.41	7.63	5.811	0.603	0.595	0.006	0.052	0.032
6	SHB 6. Superstructure - Main Span Erection	89.52	182.87	22.95	0.19	10.23	9.30	5.811	0.603	0.595	0.006	0.052	0.032
7	SHB 7. Bridge Demolition (including both approaches)	75.58	116.02	17.32	0.13	7.29	6.63	6.199	0.643	0.635	0.007	0.055	0.034
8	SHB 8. Barriers and Joints	4.41	5.57	0.66	0.01	0.22	0.19	3.099	0.322	0.318	0.003	0.028	0.017
9	SHB 9. Stripping, Lighting, and Signing	32.32	91.56	9.83	0.10	3.60	3.30	3.874	0.402	0.397	0.004	0.034	0.022
10	SR-47 1. Site Preparation - Earthwork	65.72	123.34	17.16	0.13	7.30	6.68	5.811	0.603	0.595	0.006	0.052	0.032
11	SR-47 2. Site Preparation - Drilled Shaft Construction	46.72	102.80	11.96	0.11	4.51	4.12	5.424	0.563	0.556	0.006	0.048	0.030
12	SR47 3: Foundation Construction	61.73	137.43	16.45	0.15	6.41	5.86	2.712	0.281	0.278	0.003	0.024	0.015
13	SR47 4: Column Construction	25.08	50.66	6.26	0.05	2.30	2.10	2.712	0.281	0.278	0.003	0.024	0.015
14	SR47 5: Falsework	50.96	100.72	13.58	0.11	6.03	5.53	5.811	0.603	0.595	0.006	0.052	0.032
15	SR47 6: Superstructure - Span Erection	103.51	211.00	27.09	0.22	10.69	9.75	9.686	1.005	0.992	0.011	0.086	0.054
16	SR47 7: Drainage	45.17	80.96	11.42	0.09	4.57	4.17	4.649	0.482	0.476	0.005	0.041	0.026
17	SR47 8: Retaining Walls and Soundwalls	51.11	93.49	13.01	0.10	5.49	5.02	4.262	0.442	0.437	0.005	0.038	0.024
18	SR47 9: Striping, Lighting and Signing	39.06	80.90	10.64	0.09	4.29	3.93	5.424	0.563	0.556	0.006	0.048	0.030
20	Flyover 1. Site Preparation - Earthwork	9.75	17.96	2.43	0.03	0.78	0.71	1.585	0.157	0.169	0.003	0.022	0.014253
21	Flyover 2. Drilled Shaft Construction	41.01	72.72	9.24	0.12	3.16	2.87	2.641	0.262	0.281	0.004	0.037	0.023755
22	Flyover 3. Column Construction	24.75	44.83	5.97	0.07	2.17	1.97	2.641	0.262	0.281	0.004	0.037	0.023755
23	Flyover 4. Falsework	56.69	102.53	13.83	0.15	5.59	5.13	2.641	0.262	0.281	0.004	0.037	0.023755
24	Flyover 5. superstructure - Span Erection	69.19	117.62	15.80	0.18	6.24	5.66	3.170	0.314	0.337	0.005	0.044	0.028506
25	Flyover 6. Drainage	24.12	41.76	5.81	0.06	2.28	2.08	1.321	0.131	0.140	0.002	0.018	0.011877
26	Flyover 7. Retaining Walls and Soundwalls	59.33	84.62	11.93	0.14	4.68	4.23	3.170	0.314	0.337	0.005	0.044	0.028506
27	Flyover 8. Striping, Lighting and Signing	13.92	26.58	3.58	0.04	1.32	1.21	1.585	0.157	0.169	0.003	0.022	0.014253
	SHB SR47 Stock Piles (entire project)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Overlapping phases												
	2,4,8,10,11,13,14,16	338	690	87	0.7	35	32	36	3.70	3.65	0.04	0.32	0.20
	2,4,5,6,8,10,11,13,14,15,16,17	668	1341	171	1.4	70	63	61	6.35	6.27	0.07	0.54	0.34
	2,4,5,6,8,9,11,12,13,14,15,16,17,18	736	1528	191	1.6	77	70	67	7.00	6.91	0.07	0.60	0.37
	2,3,4,5,6,7,8,9,11,13,14,15,16,18	755	1528	192	1.6	77	70	69	7.17	7.08	0.08	0.62	0.39
	2,3,4,6,7,8,9,11,13,14,15,16,18	669	1364	171	1.5	69	63	63	6.57	6.49	0.07	0.56	0.35
	20	12	27	3	0.031	1.2	1.1	2.6	0.3	0.28	0.00	0.02	0.018682
	21,25	63	113	15	0.2	5.2	4.8	4.3	0.4	0.49	0.01	0.05	0.048304
	22,23,26	134	228	31	0.4	12.0	11.0	9.2	0.9	1.04	0.01	0.11	0.103048
	27	14	26	3.6	0.04	1.3	1.2	1.7	0.2	0.20	0.00	0.02	0.019322
	Max. Daily Emissions	**755**	**1528**	**192**	**1.6**	**77**	**70**	**69**	**7.2**	**7.1**	**0.08**	**0.62**	**0.39**

Appendix G:

Table G4: Construction Equipment Usage (Segmental) - Alternative 3

Schuyler Heim Bridge (SHB)

SHB 1: Clearing, Grubbing & Earthwork

Construction duration from 1/11/2009 to 2/11/2009 This work will occur in stages as work areas become available.

Number of construction Workers 4 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe/excavator	NA	1	1	20	8	160	8	NA	NA	NA	NA
Pick Up	NA	1	1	20	4	80	NA	60	1	5	55
Haul Truck	NA	1	1	20	4	80	NA	50	2	4	46
Worker commute	NA	4	NA	NA	NA	NA	NA	40	1	0	40

SHB 2. Shaft and Columns - Drilled Shaft Construction

Construction duration from 2/1/2009 to 2/1/2011

Number of construction Workers 14 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**CIDH**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per CIDH**	**per CIDH**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
200 ton crane	NA	2	87	10	80	13920	8	NA	NA	NA	NA
Caisson Drill	NA	1	87	4	32	2784	8	NA	NA	NA	NA
200 ton gantry	NA	2	87	7	56	9744	8	NA	NA	NA	NA
Generator	NA	2	87	10	80	13920	8	NA	NA	NA	NA
Flatbed	NA	2	87	8	64	11136	NA	50	1.5	6	44
Pick Up	NA	4	87	10	80	27840	NA	50	1.5	10	40
Concrete Truck	NA	10	87	3	24	20880	NA	32	2	2	30
Concrete Pump Truck	NA	2	87	3	24	4176	8	NA	NA	NA	NA
Compressor	NA	2	87	10	80	13920	8	NA	NA	NA	NA
Water Truck	NA	1	87	4	32	2784	8	NA	NA	NA	NA
Worker commute	NA	14	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	3848	40	ft^3	290
Soil loading	333	47.5	yd^3	7.0

Appendix G:

Table G4: Construction Equipment Usage (Segmental) - Alternative 3 (continued)

SHB 3. Shaft and Columns - Footing Construction

Construction duration from 1/1/2010 to 1/20/2011

Number of construction Workers 7 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Embank. Wall**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per Wall**	**per Wall**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe/excavator	NA	2	2	5	40	160	8	NA	NA	NA	NA
200 ton crane	NA	1	2	2	16	32	8	NA	NA	NA	NA
Generator	NA	1	2	10	80	160	8	NA	NA	NA	NA
Haul Truck	NA	4	2	5	40	320	NA	50	2	4	46
Pick Up	NA	2	2	10	80	320	NA	50	1.5	10	40
Concrete Truck	NA	12	2	3	24	576	NA	32	2	2	30
Concrete Pump Truck	NA	2	2	3	24	96	8	NA	NA	NA	NA
Compressor	NA	1	2	10	80	160	8	NA	NA	NA	NA
Water Truck	NA	1	2	4	32	64	8	NA	NA	NA	NA
Worker commute	NA	7	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	2400	86	ft^3	28
Soil loading	207	30	yd^3	7

SHB 4. Shaft and Columns - Column Construction

Construction duration from 2/20/2009 to 3/1/2011

Number of construction Workers 7 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Columns**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per Col.**	**per Col.**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
140 ton crane	NA	1	87	1	8	696	8	NA	NA	NA	NA
Generator	NA	1	87	4	32	2784	8	NA	NA	NA	NA
Flatbed	NA	1	87	2.5	20	1740	NA	50	1.5	6	44
Pick Up	NA	2	87	4	32	5568	NA	50	1.5	10	40
Concrete Truck	NA	4	87	2	16	5568	NA	32	2	2	30
Concrete Pump Truck	NA	2	87	2	16	2784	8	NA	NA	NA	NA
Compressor	NA	1	87	4	32	2784	8	NA	NA	NA	NA
Worker commute	NA	7	NA	NA	NA	NA	NA	40	1	0	40

Appendix G:

Table G4: Construction Equipment Usage (Segmental) - Alternative 3 (continued)

SHB 5. superstructure - Approach Span Erection

Construction duration from 7/1/2009 to 7/30/2010

Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
275 ton crane	NA	1	18	360	2880	2880	8	NA	NA	NA	NA
Rough Terrain (f-lift)	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
200 ton gantry	NA	1	20	400	3200	3200	8	NA	NA	NA	NA
Generator	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
Semi Truck	NA	10	10	200	1600	16000	NA	42	1	2	40
Flatbed	NA	6	12	240	1920	11520	NA	50	1.5	6	44
Pick Up	NA	10	20	400	3200	32000	NA	50	1.5	10	40
Concrete Truck	NA	10	10	200	1600	16000	NA	32	2	2	30
Concrete Pump Truck	NA	2	10	200	1600	3200	8	NA	NA	NA	NA
Compressor	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	127340	2122	ft^3	60
Grading	2	0.1	acre	20
Soil loading	1572	79	yd^3	20

SHB 6. superstructure - Main Span Erection

Construction duration from 7/1/2009 to 7/30/2011

Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
400 ton crane	NA	2	10	200	1600	3200	8	NA	NA	NA	NA
Rough Terrain (f-lift)	NA	4	10	200	1600	6400	8	NA	NA	NA	NA
200 ton gantry	NA	2	14	280	2240	4480	8	NA	NA	NA	NA
Generator	NA	3	20	400	3200	9600	8	NA	NA	NA	NA
Semi Truck	NA	20	10	200	1600	32000	NA	42	1	2	40
Flatbed	NA	6	18	360	2880	17280	NA	50	1.5	6	44
Pick Up	NA	10	18	360	2880	28800	NA	50	1.5	10	40
Concrete Truck	NA	1	5	50	400	400	NA	32	2	2	30
Concrete Pump Truck	NA	1	5	50	400	400	8	NA	NA	NA	NA
Compressor	NA	3	20	400	3200	9600	8	NA	NA	NA	NA
Loader	NA	2	1	20	160	320	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	11550	192.5	ft^3	60
Grading	1.5	0.1	acre	30
Soil loading	42.8	2	yd^3	20

Appendix G:

Table G4: Construction Equipment Usage (Segmental) - Alternative 3 (continued)

SHB 7. Bridge Demolition (including both approaches)

Construction duration from 11/1/2009 to 3/30/2011

Number of construction Workers 16 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Pick Up	NA	6	4.5	90	3	1620	NA	50	1.5	10	40
Haul Truck	NA	10	4.5	90	4	3600	NA	50	2	4	46
Compressor	NA	4	4.5	90	8	2880	8	NA	NA	NA	NA
Generator	NA	4	4.5	90	6	2160	8	NA	NA	NA	NA
Flatbed	NA	4	4.5	90	3	1080	NA	50	1.5	6	44
Backhoe/excavator	NA	4	4.5	90	8	2880	8	NA	NA	NA	NA
Loader	NA	3	4.5	90	4	1080	8	NA	NA	NA	NA
Worker commute	NA	16	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Demolition	62500	391	ft^3	160
Excavation	40300	672	ft^4	60
Grading	2	0.1	acre	20
Soil loading	299	15	yd^3	20

SHB 8. Barriers and Joints

Construction duration from 2/1/2009 to 7/30/2011

Number of construction Workers 8 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Pick Up	NA	1	6	120	480	480	NA	50	1	6	44
Concrete Trucks	NA	2	6	120	960	1920	NA	32	2	2	30
Flatbed Truck	NA	1	6	120	480	480	NA	40	1	4	36
Semi Truck	NA	1	6	120	480	480	NA	42	1	2	40
Worker commute	NA	8	NA	NA	NA	NA	NA	40	1	0	40

SHB 9. Stripping, Lighting, and Signing

Construction duration from 9/1/2009 to 8/30/2011

Number of construction Workers 10 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Pick Up	NA	4	2	40	3	480	NA	50	1.5	10	40
Paint truck	NA	1	1.5	30	7	210	8	NA	NA	NA	NA
Compressor	NA	1	1.5	30	7	210	8	NA	NA	NA	NA
Bucket Truck	NA	2	2	40	5	400	8	NA	NA	NA	NA
Semi Truck	NA	2	0.5	10	4	80	NA	42	1	2	40
Boom Truck	NA	1	0.5	10	6	60	8	NA	NA	NA	NA
Worker commute	NA	10	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
excavation	11781	589	ft^3	20

Appendix G:

Table G4: Construction Equipment Usage (Segmental) - Alternative 3 (continued)

SR-47 Truck Expressway

SR-47 1. Site Preparation - Earthwork

Construction duration from 2/1/2009 to 9/1/2009

Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe	NA	2	4	80	640	1280	8	NA	NA	NA	NA
Loader	NA	2	4	80	640	1280	8	NA	NA	NA	NA
Haulers (Truck)	NA	4	2	40	320	1280	NA	50	2	4	46
Generator	NA	2	4	80	640	1280	8	NA	NA	NA	NA
Flatbed	NA	2	4	80	640	1280	NA	50	1.5	6	44
Pick Up	NA	4	4	80	640	2560	NA	50	1.5	10	40
Grader	NA	2	1	20	160	320	8	NA	NA	NA	NA
Vibratory loader	NA	2	1	20	160	320	8	NA	NA	NA	NA
Asphalt Paver	NA	1	1	20	160	160	8	NA	NA	NA	NA
Compressor	NA	2	4	80	640	1280	8	NA	NA	NA	NA
Water Truck	NA	1	4	80	640	640	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

SR-47 2. Site Preparation - Drilled Shaft Construction

Construction duration from 3/1/2009 to 2/1/2011

Number of construction Workers 14 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**CIDH**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per CIDH**	**per CIDH**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
200 ton crane	NA	1	120	10	80	9600	8	NA	NA	NA	NA
Caisson Drill	NA	1	120	4	32	3840	8	NA	NA	NA	NA
140 ton crane	NA	1	120	7	56	6720	8	NA	NA	NA	NA
Generator	NA	2	120	10	80	19200	8	NA	NA	NA	NA
Flatbed	NA	2	120	10	80	19200	NA	50	1.5	6	44
Pick Up	NA	4	120	10	80	38400	NA	50	1.5	10	40
Concrete Truck	NA	5	120	2	16	9600	NA	32	2	2	30
Concrete Pump Truck	NA	1	120	2	16	1920	8	NA	NA	NA	NA
Compressor	NA	1	120	1	8	960	8	NA	NA	NA	NA
Water Truck	NA	1	120	4	32	3840	8	NA	NA	NA	NA
Worker commute	NA	14	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Demolition	13572	226	ft^3	60
Excavation	16286	271	ft^3	60
Grading	2	0.1	acre	20
Soil Loading	42	2	yd^3	20

Appendix G:

Table G4: Construction Equipment Usage (Segmental) - Alternative 3 (continued)

SR47 3: Foundation Construction

Construction duration from 10/1/2009 to 11/1/2009
Number of construction Workers 7 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe/excavator	NA	2	1	20	160	320	8	NA	NA	NA	NA
140 ton crane	NA	1	1	20	160	160	8	NA	NA	NA	NA
Generator	NA	2	1	20	160	320	8	NA	NA	NA	NA
Haul Truck	NA	4	1	20	160	640	NA	50	2	4	46
Pick Up	NA	4	1	20	160	640	NA	50	1.5	10	40
Concrete Truck	NA	2	0.25	5	40	20	NA	32	2	2	30
Concrete Pump Truck	NA	2	0.25	5	40	20	8	NA	NA	NA	NA
Compressor	NA	2	1	20	160	320	8	NA	NA	NA	NA
Water Truck	NA	1	1	20	160	160	8	NA	NA	NA	NA
Pile Driver	NA	2	1	20	160	320	8	NA	NA	NA	NA
Worker commute	NA	7	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	408	81.6	ft^3	5
Soil Loading	3.0	0.6	yd^3	5

SR47 4: Column Construction

Construction duration from 2/20/2009 to 4/1/2011
Number of construction Workers 7 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Columns**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per Col.**	**per Col.**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
140 ton crane	NA	1	120	1	8	960	8	NA	NA	NA	NA
Generator	NA	1	120	4	32	3840	8	NA	NA	NA	NA
Flatbed	NA	2	120	2	16	3840	NA	50	1.5	6	44
Pick Up	NA	4	120	4	32	15360	NA	50	1.5	10	40
Concrete Truck	NA	2	120	1	8	1920	NA	32	2	2	30
Concrete Pump Truck	NA	1	120	1	8	960	8	NA	NA	NA	NA
Compressor	NA	1	120	4	32	3840	8	NA	NA	NA	NA
Worker commute	NA	7	NA	NA	NA	NA	NA	40	1	0	40

Appendix G:

Table G4: Construction Equipment Usage (Segmental) - Alternative 3 (continued)

SR47 5: Falsework

Construction duration from 3/1/2009 to 7/30/2011
Number of construction Workers 15 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
100 ton crane	NA	1	30	600	4800	4800	8	NA	NA	NA	NA
Generator	NA	2	30	600	4800	9600	8	NA	NA	NA	NA
Flatbed	NA	2	30	600	4800	9600	NA	50	1.5	6	44
Pick Up	NA	4	30	600	4800	19200	NA	50	1.5	10	40
Rough Terrain (f - lift)	NA	4	30	600	4800	19200	8	NA	NA	NA	NA
Scissor Lift	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
Compressor	NA	2	30	600	4800	9600	8	NA	NA	NA	NA
Boom	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
Worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

SR47 6: Superstructure - Span Erection

Construction duration from 7/1/2009 to 7/30/2011
Number of construction Workers 25 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
275 ton crane	NA	1	18	360	2880	2880	8	NA	NA	NA	NA
Rough Terrain (f-lift)	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
140 ton crane	NA	1	20	400	3200	3200	8	NA	NA	NA	NA
Generator	NA	4	18	360	2880	11520	8	NA	NA	NA	NA
Semi Truck	NA	4	16	320	2560	10240	NA	42	1	2	40
Flatbed	NA	4	20	400	3200	12800	NA	50	1.5	6	44
Pick Up	NA	10	20	400	3200	32000	NA	50	1.5	10	40
Concrete Truck	NA	12	9	180	1440	17280	NA	32	2	2	30
Concrete Pump Truck	NA	4	9	180	1440	5760	8	NA	NA	NA	NA
Compressor	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
Worker commute	NA	25	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Demolition	120000	12000	ft^3	10
Excavation	12000	1200	ft^3	10
grading	1.5	0.3	acre	5
paving	1.5	0.15	acre	10

Appendix G:

Table G4: Construction Equipment Usage (Segmental) - Alternative 3 (continued)

SR47 7: Drainage

Construction duration from 3/1/2009 to 3/1/2011

Number of construction Workers 12 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe	NA	1	2	40	320	320	8	NA	NA	NA	NA
Loader	NA	1	2	40	320	320	8	NA	NA	NA	NA
Haulers (Truck)	NA	2	0.5	10	80	160	NA	50	2	4	46
Generator	NA	2	2	40	320	640	8	NA	NA	NA	NA
Flatbed	NA	4	2	40	320	1280	NA	50	1.5	6	44
Pick Up	NA	4	2	40	320	1280	NA	50	1.5	10	40
Vibratory Roller	NA	2	1	20	160	320	8	NA	NA	NA	NA
Compressor	NA	2	2	40	320	640	8	NA	NA	NA	NA
Water Truck	NA	1	1	20	160	160	8	NA	NA	NA	NA
Concrete Truck	NA	1	0.25	5	40	40	NA	32	2	2	30
Worker commute	NA	12	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Demolition	105600	660	ft^3	160
Excavation	73920	616	ft^4	120
grading	2	0.10	acre	20
Paving	2	0.07	acre	30
Soil dumping	10	0.5	yd^3	60

SR47 8: Retaining Walls and Soundwalls

Construction duration from 7/1/2009 to 12/30/2009

Number of construction Workers 11 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe	NA	2	3	60	480	960	8	NA	NA	NA	NA
Loader	NA	2	3	60	480	960	8	NA	NA	NA	NA
Haulers (Truck)	NA	4	2	40	320	1280	NA	50	2	4	46
Generator	NA	2	3	60	480	960	8	NA	NA	NA	NA
Flatbed	NA	2	2	40	320	640	NA	50	1.5	6	44
Pick Up	NA	2	3	60	480	960	NA	50	1.5	10	40
Vibratory Roller	NA	2	2	40	320	640	8	NA	NA	NA	NA
Compressor	NA	2	3	60	480	960	8	NA	NA	NA	NA
Water Truck	NA	1	3	60	480	480	8	NA	NA	NA	NA
Concrete Truck	NA	1	0.25	5	40	40	NA	32	2	2	30
Worker commute	NA	11	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	100000	2500	ft^3	40
Grading	2	0.2	acre	10
Soil Loading	231	23	yd^3	10

Appendix G:

Table G4: Construction Equipment Usage (Segmental) - Alternative 3 (continued)

SR47 9: Striping, Lighting and Signing

Construction duration from 9/1/2009 to 8/30/2011

Number of construction Workers 14 Round trip distance per Worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Boom	NA	2	2	40	320	640	8	NA	NA	NA	NA
Loader	NA	1	1.5	30	240	240	8	NA	NA	NA	NA
Generator	NA	4	3	60	480	1920	8	NA	NA	NA	NA
Flatbed	NA	2	3	60	480	960	NA	50	1.5	6	44
Pick Up	NA	4	3	60	480	1920	NA	50	1.5	10	40
Compressor	NA	2	3	60	480	960	8	NA	NA	NA	NA
Striper (Truck)	NA	1	1	20	160	160	8	NA	NA	NA	NA
Worker commute	NA	14	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	29452	982	ft^3	30

SHB and SR-47: Stockpile Area

Construction duration from 1/11/2009 to 8/30/2011

	Maximum Area Covered	**Unit**
Stock Piles	2	acres/day

1. Construction data provided by DMJM Harris, May 2005
2. Stock pile areas were not specified for each construction phases. The maximum areas that might be covered each day by the whole project was used to calculate the total fugitive dust emissions from stock piles.

Appendix G:

Table G5: Emission Factors (Segmental) - Alternative 3

SHB 1: Clearing, Grubbing & Earthwork

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe/excavator	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Haul Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.000011	0.00009	0.997	0.000	0.211

SHB 2. Shaft and Columns - Drilled Shaft Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
200 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Caisson Drill	Bore/Drill Rigs	2009	lb/hr	0.520	1.229	0.116	0.002	0.054	0.000	0.050	0.000
200 ton gantry	Other Construction Equipmen	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.043	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truc	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Soil loading	Soil loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008
Stock piles											

Appendix G:

Table G5: Emission Factors (Segmetnal) - Alternative 3 (continued)

SHB 3. Shaft and Columns - Footing Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe/excavator	Tractors/Loaders/Backhoes	2010	lb/hr	0.393	0.675	0.102	0.001	0.052	0.000	0.048	0.000
200 ton crane	Cranes	2010	lb/hr	0.543	1.451	0.159	0.001	0.064	0.000	0.059	0.000
Generator	Generator Sets	2010	lb/hr	0.329	0.644	0.096	0.001	0.040	0.000	0.036	0.000
Haul Truck	On-road Delivery	2010	lb/VMT	0.018	0.021	0.003	0.00003	0.00075	0.997	0.001	0.211
Pick Up	On-road passenger	2010	lb/VMT	0.008	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2010	lb/VMT	0.018	0.021	0.003	0.00003	0.00075	0.997	0.001	0.211
Concrete Pump Truc	Off-Highway Trucks	2010	lb/hr	0.743	2.388	0.248	0.003	0.088	0.000	0.081	0.000
Compressor	Air compressor	2010	lb/hr	0.361	0.732	0.112	0.001	0.053	0.000	0.048	0.000
Water Truck	Off-Highway Trucks	2010	lb/hr	0.743	2.388	0.248	0.003	0.088	0.000	0.081	0.000
Worker commute	On-road passenger	2010	lb/VMT	0.008	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2010	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Soil loading	Soil loading	2010	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008
Stock piles											

SHB 4. Shaft and Columns - Column Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truc	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211

Appendix G:

Table G5: Emission Factors (Segmetnal) - Alternative 3 (continued)

SHB 5. superstructure - Approach Span Erection

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
275 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Rough Terrain (f-lift)	Rough Terrain Forklifts	2009	lb/hr	0.482	0.851	0.137	0.001	0.072	0.000	0.066	0.000
200 ton gantry	Other Construction Equipmen	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.043	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.002	1.861	0.002	0.395
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truc	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Soil loading	Soil loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008
Stock piles											

SHB 6. superstructure - Main Span Erection

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
400 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Rough Terrain (f-lift)	Rough Terrain Forklifts	2009	lb/hr	0.482	0.851	0.137	0.001	0.072	0.000	0.066	0.000
200 ton gantry	Other Construction Equipmen	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.043	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.002	1.861	0.002	0.395
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truc	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Soil loading	Soil loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008
Stock piles											

Appendix G:

Table G5: Emission Factors (Segmetnal) - Alternative 3 (continued)

SHB 7. Bridge Demolition (including both approaches)

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Haul Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Backhoe/excavator	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Demolition	Demolition	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Soil loading	Soil loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008
Stock piles											

SHB 8. Barriers and Joints

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.9973	0.000	0.211
Concrete Trucks	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.9973	0.001	0.211
Flatbed Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.9973	0.001	0.211
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.002	1.8611	0.002	0.395
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.9973	0.000	0.211

SHB 9. Stripping, Lighting, and Signing

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Paint truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Bucket Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.002	1.861	0.002	0.395
Boom Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000

Appendix G:

Table G5: Emission Factors (Segmetnal) - Alternative 3 (continued)

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SR-47 1. Site Preparation - Earthwork

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Haulers (Truck)	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Grader	Graders	2009	lb/hr	0.643	1.524	0.183	0.001	0.080	0.000	0.073	0.000
Vibratory loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Asphalt Paver	Pavers	2009	lb/hr	0.576	1.032	0.187	0.001	0.074	0.000	0.068	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211

SR-47 2. Site Preparation - Drilled Shaft Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
200 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Caisson Drill	Bore/Drill Rigs	2009	lb/hr	0.520	1.229	0.116	0.002	0.054	0.000	0.050	0.000
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truc	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Demolition	Demolition	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Soil Loading	Soil Loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008
Stock piles											

Appendix G:

Table G5: Emission Factors (Segmetnal) - Alternative 3 (continued)

SR47 3: Foundation Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe/excavator	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Haul Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truc	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Pile Driver	Other Construction Equipmen	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.043	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Soil Loading	Soil Loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008
Stock piles											

SR47 4: Column Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truc	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211

Appendix G:

Table G5: Emission Factors (Segmetnal) - Alternative 3 (continued)

SR47 5: Falsework

Emission Factors (see Appendix I for details and reference of emission factors)

Equipment Descripti	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
100 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Rough Terrain (f - lift	Rough Terrain Forklifts	2009	lb/hr	0.482	0.851	0.137	0.001	0.072	0.000	0.066	0.000
Scissor Lift	Other Construction Equipmen	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.043	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Boom	Other Construction Equipmen	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.043	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211

SR47 6: Superstructure - Span Erection

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
275 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Rough Terrain (f-lift)	Rough Terrain Forklifts	2009	lb/hr	0.482	0.851	0.137	0.001	0.072	0.000	0.066	0.000
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.002	1.861	0.002	0.395
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truc	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Demolition	Demolition	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
grading	grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
paving	paving	2009	lb ROG / acre	0.000	0.000	2.620	0.000	0.000	0.000	0.000	0.000

Appendix G:

Table G5: Emission Factors (Segmetnal) - Alternative 3 (continued)

SR47 7: Drainage

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Haulers (Truck)	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Vibratory Roller	Rollers	2009	lb/hr	0.427	0.817	0.125	0.001	0.057	0.000	0.053	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Demolition	Demolition	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
grading	grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Paving	Paving	2009	lb ROG / acre	0.000	0.000	2.620	0.000	0.000	0.000	0.000	0.000
Soil dumping	Soil dumping	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.016	0.000	0.003
Stock piles											

SR47 8: Retaining Walls and Soundwalls

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Haulers (Truck)	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Vibratory Roller	Rollers	2009	lb/hr	0.427	0.817	0.125	0.001	0.057	0.000	0.053	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.0004	0.000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Soil Loading	Soil Loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008
stock piles											

Appendix G:

Table G5: Emission Factors (Segmetnal) - Alternative 3 (continued)

SR47 9: Striping, Lighting and Signing

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Boom	Other Construction Equipmen	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.043	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Striper (Truck)	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.00001	0.00009	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

SHB and SR-47: Stockpile Area

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Stock piles	Stock piles	All	lb/acre/day	0.000	0.000	0.000	0.000	0.000	39.908	0.000	8.301

Note:

1. Stock pile areas were not specified or calculated for each construction phases. The maximum areas that might be covered each day by the whole project was used to calculate the total fugitive dust emissions from stock piles.
2. Detailed references of the emission factors are in Appendix I.

Appendix G:

Table G6: Daily Emissions (Segmental) - Alternative 3

SHB 1: Clearing, Grubbing & Earthwork

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
Pick Up	0.581	0.060	0.060	0.001	0.005	4.987	0.003	1.057
Haul Truck	2.016	2.237	0.279	0.003	0.081	3.989	0.069	0.846
Worker commute	1.550	0.161	0.159	0.002	0.014	0.000	0.009	0.000
Total	7.341	8.239	1.384	0.011	0.547	8.976	0.493	1.903

SHB 1: Clearing, Grubbing & Earthwork

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.1943	5.7812	0.8869	0.0062	0.4472	0.0000	0.4114	0.0000
Pick Up	0.5811	0.0603	0.0595	0.0006	0.0052	2.7427	0.0032	0.5814
Haul Truck	2.0161	2.2366	0.2789	0.0027	0.0805	2.1941	0.0692	0.4652
Worker commute	1.5497	0.1608	0.1588	0.0017	0.0138	0.0000	0.0086	0.0000
Total	7.3412	8.2390	1.3841	0.0112	0.5467	4.9368	0.4925	1.0466

0

SHB 2. Shaft and Columns - Drilled Shaft Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
200 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.998	0.000
Caisson Drill	4.160	9.830	0.929	0.014	0.432	0.000	0.398	0.000
200 ton gantry	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Concrete Truck	12.903	14.314	1.785	0.017	0.516	19.947	0.443	4.229
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.000	0.030	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.017	0.000	0.003
Soil loading	0.000	0.000	0.000	0.000	0.000	1.886	0.000	0.392
Total	74.768	154.356	18.239	0.173	6.747	73.710	6.147	15.619

SHB 2. Shaft and Columns - Drilled Shaft Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
200 ton crane	9.128	24.470	2.693	0.022	1.085	0.0000	0.9980	0.0000
Caisson Drill	4.160	9.830	0.929	0.014	0.432	0.0000	0.3979	0.0000
200 ton gantry	6.866	17.299	1.808	0.020	0.753	0.0000	0.6932	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.0000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.5824	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.9413	0.0162	4.6516
Concrete Truck	12.903	14.314	1.785	0.017	0.516	10.9707	0.4431	2.3258
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.0000	1.3674	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.0000	0.8045	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.0000	0.6837	0.0000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.0000	0.0302	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.0054	0.0000	0.0011
Soil loading	0.000	0.000	0.000	0.000	0.000	0.6034	0.0000	0.1255
Total	74.768	154.356	18.239	0.173	6.747	40.103	6.147	8.499

Appendix G:

Table G6: Daily Emissions (Segmental) - Alternative 3 (continued)

SHB 3. Shaft and Columns - Footing Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	6.287	10.796	1.633	0.012	0.833	0.000	0.766	0.000
200 ton crane	4.345	11.612	1.275	0.011	0.514	0.000	0.473	0.000
Generator	2.634	5.152	0.769	0.006	0.317	0.000	0.292	0.000
Haul Truck	7.375	8.250	1.036	0.011	0.300	15.957	0.257	3.383
Pick Up	1.239	0.138	0.137	0.002	0.013	19.947	0.008	4.229
Concrete Truck	14.160	15.840	1.989	0.021	0.577	23.936	0.493	5.074
Concrete Pump Truck	11.886	38.216	3.968	0.043	1.400	0.000	1.288	0.000
Compressor	2.890	5.856	0.896	0.006	0.421	0.000	0.387	0.000
Water Truck	5.943	19.108	1.984	0.021	0.700	0.000	0.644	0.000
Worker commute	2.314	0.257	0.256	0.003	0.024	0.000	0.015	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.036	0.000	0.007
Soil loading	0.000	0.000	0.000	0.000	0.000	1.176	0.000	0.245
Total	59.074	115.225	13.943	0.135	5.100	61.052	4.624	12.938

SHB 3. Shaft and Columns - Footing Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	6.287	10.796	1.633	0.012	0.833	0.0000	0.7662	0.0000
200 ton crane	4.345	11.612	1.275	0.011	0.514	0.0000	0.4726	0.0000
Generator	2.634	5.152	0.769	0.006	0.317	0.0000	0.2917	0.0000
Haul Truck	7.375	8.250	1.036	0.011	0.300	8.7765	0.2569	1.8606
Pick Up	1.239	0.138	0.137	0.002	0.013	10.9707	0.0082	2.3258
Concrete Truck	14.160	15.840	1.989	0.021	0.577	13.1648	0.4933	2.7909
Concrete Pump Truck	11.886	38.216	3.968	0.043	1.400	0.0000	1.2881	0.0000
Compressor	2.890	5.856	0.896	0.006	0.421	0.0000	0.3874	0.0000
Water Truck	5.943	19.108	1.984	0.021	0.700	0.0000	0.6441	0.0000
Worker commute	2.314	0.257	0.256	0.003	0.024	0.0000	0.0153	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.0115	0.0000	0.0024
Soil loading	0.000	0.000	0.000	0.000	0.000	0.3763	0.0000	0.0783
Total	59.074	115.225	13.943	0.135	5.100	33.300	4.624	7.058

SHB 4. Shaft and Columns - Column Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.305	0.000
Flatbed	1.512	1.677	0.209	0.002	0.060	5.984	0.052	1.269
Pick Up	1.453	0.151	0.149	0.002	0.013	19.947	0.008	4.229
Concrete Truck	5.161	5.726	0.714	0.007	0.206	7.979	0.177	1.691
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.015	0.000
Total	33.753	72.384	8.611	0.078	3.101	33.909	2.826	7.189

SHB 4. Shaft and Columns - Column Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.3046	0.0000
Flatbed	1.512	1.677	0.209	0.002	0.060	3.291	0.0519	0.6977
Pick Up	1.453	0.151	0.149	0.002	0.013	10.971	0.0081	2.3258
Concrete Truck	5.161	5.726	0.714	0.007	0.206	4.388	0.1772	0.9303
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.3674	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.4022	0.0000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.0151	0.0000
Total	33.753	72.384	8.611	0.078	3.101	18.650	2.826	3.954

Appendix G:

Table G6: Daily Emissions (Segmental) - Alternative 3 (continued)

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SHB 5. superstructure - Approach Span Erection

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Rough Terrain (f-lift)	7.704	13.608	2.188	0.013	1.150	0.000	1.058	0.000
200 ton gantry	3.433	8.650	0.904	0.010	0.377	0.000	0.347	0.000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.219	0.000
Semi Truck	5.385	17.575	1.383	0.017	0.838	37.222	0.736	7.891
Flatbed	9.072	10.065	1.255	0.012	0.362	35.904	0.312	7.612
Pick Up	7.264	0.754	0.744	0.008	0.065	99.733	0.040	21.143
Concrete Truck	12.903	14.314	1.785	0.017	0.516	19.947	0.443	4.229
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.609	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.891	0.000	0.185
Grading	0.000	0.000	0.000	0.000	0.000	2.640	0.000	0.549
Soil loading	0.000	0.000	0.000	0.000	0.000	3.120	0.000	0.649
Total	91.475	164.635	21.396	0.182	8.461	199.457	7.661	42.258

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SHB 5. superstructure - Approach Span Erection

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Rough Terrain (f-lift)	7.704	13.608	2.188	0.013	1.150	0.000	1.0576	0.0000
200 ton gantry	3.433	8.650	0.904	0.010	0.377	0.000	0.3466	0.0000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.2185	0.0000
Semi Truck	5.385	17.575	1.383	0.017	0.838	20.472	0.7360	4.3401
Flatbed	9.072	10.065	1.255	0.012	0.362	19.747	0.3115	4.1864
Pick Up	7.264	0.754	0.744	0.008	0.065	54.853	0.0404	11.6289
Concrete Truck	12.903	14.314	1.785	0.017	0.516	10.971	0.4431	2.3258
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.3674	0.0000
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.6090	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.0323	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.285	0.0000	0.0593
Grading	0.000	0.000	0.000	0.000	0.000	0.845	0.0000	0.1757
Soil loading	0.000	0.000	0.000	0.000	0.000	0.998	0.0000	0.2077
Total	91.475	164.635	21.396	0.182	8.461	108.172	7.661	22.924

SHB 6. superstructure - Main Span Erection

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
400 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.998	0.000
Rough Terrain (f-lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.115	0.000
200 ton gantry	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Generator	8.108	16.124	2.448	0.017	0.993	0.000	0.914	0.000
Semi Truck	10.771	35.151	2.766	0.034	1.676	74.444	1.472	15.782
Flatbed	9.072	10.065	1.255	0.012	0.362	35.904	0.312	7.612
Pick Up	7.264	0.754	0.744	0.008	0.065	99.733	0.040	21.143
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.995	0.044	0.423
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	8.878	18.393	2.831	0.017	1.312	0.000	1.207	0.000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.081	0.000	0.017
Grading	0.000	0.000	0.000	0.000	0.000	1.320	0.000	0.275
Soil loading	0.000	0.000	0.000	0.000	0.000	0.085	0.000	0.018
Total	95.331	183.473	23.548	0.198	10.287	213.561	9.334	45.269

SHB 6. superstructure - Main Span Erection

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
400 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.9980	0.0000
Rough Terrain (f-lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.1153	0.0000
200 ton gantry	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Generator	8.108	16.124	2.448	0.017	0.993	0.000	0.9139	0.0000
Semi Truck	10.771	35.151	2.766	0.034	1.676	40.944	1.4719	8.6801
Flatbed	9.072	10.065	1.255	0.012	0.362	19.747	0.3115	4.1864
Pick Up	7.264	0.754	0.744	0.008	0.065	54.853	0.0404	11.6289
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.097	0.0443	0.2326
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	8.878	18.393	2.831	0.017	1.312	0.000	1.2067	0.0000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.0323	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.026	0.0000	0.0054
Grading	0.000	0.000	0.000	0.000	0.000	0.422	0.0000	0.0879
Soil loading	0.000	0.000	0.000	0.000	0.000	0.027	0.0000	0.0057
Total	95.331	183.473	23.548	0.198	10.287	117.117	9.334	24.827

Appendix G:

Table G6: Daily Emissions (Segmental) - Alternative 3 (continued)

SHB 7. Bridge Demolition (including both approaches)

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	4.359	0.452	0.447	0.005	0.039	59.840	0.024	12.686
Haul Truck	20.161	22.366	2.789	0.027	0.805	39.893	0.692	8.457
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.609	0.000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.219	0.000
Flatbed	6.048	6.710	0.837	0.008	0.242	23.936	0.208	5.074
Backhoe/excavator	12.777	23.125	3.547	0.025	1.789	0.000	1.646	0.000
Loader	9.583	17.344	2.661	0.019	1.342	0.000	1.234	0.000
Worker commute	6.199	0.643	0.635	0.007	0.055	0.000	0.034	0.000
Demolition	0.000	0.000	0.000	0.000	0.000	0.164	0.000	0.034
Excavation	0.000	0.000	0.000	0.000	0.000	0.282	0.000	0.059
Grading	0.000	0.000	0.000	0.000	0.000	2.640	0.000	0.549
Soil loading	0.000	0.000	0.000	0.000	0.000	0.592	0.000	0.123
Total	81.775	116.663	17.954	0.135	7.345	127.348	6.666	26.983

SHB 7. Bridge Demolition (including both approaches)

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	4.359	0.452	0.447	0.005	0.039	32.912	0.0242	6.9773
Haul Truck	20.161	22.366	2.789	0.027	0.805	21.941	0.6923	4.6516
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.6090	0.0000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.2185	0.0000
Flatbed	6.048	6.710	0.837	0.008	0.242	13.165	0.2077	2.7909
Backhoe/excavator	12.777	23.125	3.547	0.025	1.789	0.000	1.6457	0.0000
Loader	9.583	17.344	2.661	0.019	1.342	0.000	1.2343	0.0000
Worker commute	6.199	0.643	0.635	0.007	0.055	0.000	0.0345	0.0000
Demolition	0.000	0.000	0.000	0.000	0.000	0.053	0.0000	0.0109
Excavation	0.000	0.000	0.000	0.000	0.000	0.090	0.0000	0.0188
Grading	0.000	0.000	0.000	0.000	0.000	0.845	0.0000	0.1757
Soil loading	0.000	0.000	0.000	0.000	0.000	0.190	0.0000	0.0394
Total	81.775	116.663	17.954	0.135	7.345	69.195	6.666	14.665

SHB 8. Barriers and Joints

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	0.484	0.050	0.050	0.001	0.004	5.984	0.003	1.269
Concrete Trucks	2.581	2.863	0.357	0.003	0.103	3.989	0.089	0.846
Flatbed Truck	0.806	0.895	0.112	0.001	0.032	3.989	0.028	0.846
Semi Truck	0.539	1.758	0.138	0.002	0.084	3.722	0.074	0.789
Worker commute	3.099	0.322	0.318	0.003	0.028	0.000	0.017	0.000
Total	7.509	5.887	0.974	0.010	0.251	17.685	0.210	3.749

SHB 8. Barriers and Joints

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	0.484	0.050	0.050	0.001	0.004	3.291	0.0027	0.6977
Concrete Trucks	2.581	2.863	0.357	0.003	0.103	2.194	0.0886	0.4652
Flatbed Truck	0.806	0.895	0.112	0.001	0.032	2.194	0.0277	0.4652
Semi Truck	0.539	1.758	0.138	0.002	0.084	2.047	0.0736	0.4340
Worker commute	3.099	0.322	0.318	0.003	0.028	0.000	0.0172	0.0000
Total	7.509	5.887	0.974	0.010	0.251	9.727	0.210	2.062

SHB 9. Stripping, Lighting, and Signing

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Paint truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Bucket Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Semi Truck	1.077	3.515	0.277	0.003	0.168	7.444	0.147	1.578
Boom Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	3.874	0.402	0.397	0.004	0.034	0.000	0.022	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.247	0.000	0.051
Total	36.194	91.966	10.225	0.102	3.638	47.585	3.322	10.087

SHB 9. Stripping, Lighting, and Signing

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Paint truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.4022	0.0000
Bucket Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.3674	0.0000
Semi Truck	1.077	3.515	0.277	0.003	0.168	4.094	0.1472	0.8680
Boom Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Worker commute	3.874	0.402	0.397	0.004	0.034	0.000	0.0215	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.079	0.0000	0.0165
Total	36.194	91.966	10.225	0.102	3.638	26.115	3.322	5.536

Appendix G:

Table G6: Daily Emissions (Segmental) - Alternative 3 (continued)

SR-47 1. Site Preparation - Earthwork

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Haulers (Truck)	8.064	8.947	1.116	0.011	0.322	15.957	0.277	3.383
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Grader	10.285	24.380	2.920	0.024	1.273	0.000	1.171	0.000
Vibratory loader	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Asphalt Paver	4.605	8.257	1.494	0.007	0.591	0.000	0.544	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Total	71.530	123.946	17.759	0.136	7.348	67.819	6.710	14.378

SR-47 1. Site Preparation - Earthwork

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Haulers (Truck)	8.064	8.947	1.116	0.011	0.322	8.777	0.2769	1.8606
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Grader	10.285	24.380	2.920	0.024	1.273	0.000	1.1714	0.0000
Vibratory loader	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Asphalt Paver	4.605	8.257	1.494	0.007	0.591	0.000	0.5437	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.8045	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.0323	0.0000
Total	71.530	123.946	17.759	0.136	7.348	37.300	6.710	7.908

SR-47 2. Site Preparation - Drilled Shaft Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
200 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Caisson Drill	4.160	9.830	0.929	0.014	0.432	0.000	0.398	0.000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Concrete Truck	6.451	7.157	0.892	0.009	0.258	9.973	0.222	2.114
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.000	0.030	0.000
Demolition	0.000	0.000	0.000	0.000	0.000	0.095	0.000	0.020
Excavation	0.000	0.000	0.000	0.000	0.000	0.114	0.000	0.024
Grading	0.000	0.000	0.000	0.000	0.000	2.640	0.000	0.549
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.083	0.000	0.017
Total	52.147	103.364	12.517	0.117	4.556	64.767	4.146	13.719

SR-47 2. Site Preparation - Drilled Shaft Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
200 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Caisson Drill	4.160	9.830	0.929	0.014	0.432	0.000	0.3979	0.0000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Concrete Truck	6.451	7.157	0.892	0.009	0.258	5.485	0.2215	1.1629
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.4022	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.000	0.0302	0.0000
Demolition	0.000	0.000	0.000	0.000	0.000	0.030	0.0000	0.0063
Excavation	0.000	0.000	0.000	0.000	0.000	0.036	0.0000	0.0076
Grading	0.000	0.000	0.000	0.000	0.000	0.845	0.0000	0.1757
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.027	0.0000	0.0055
Total	52.147	103.364	12.517	0.117	4.556	34.947	4.146	7.405

Appendix G:

Table G6: Daily Emissions (Segmental) - Alternative 3 (continued)

SR47 3: Foundation Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Haul Truck	8.064	8.947	1.116	0.011	0.322	15.957	0.277	3.383
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Concrete Truck	2.581	2.863	0.357	0.003	0.103	3.989	0.089	0.846
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Pile Driver	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.015	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.034	0.000	0.007
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.024	0.000	0.005
Total	64.439	137.713	16.729	0.150	6.432	59.898	5.877	12.698

SR47 3: Foundation Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Haul Truck	8.064	8.947	1.116	0.011	0.322	8.777	0.2769	1.8606
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Concrete Truck	2.581	2.863	0.357	0.003	0.103	2.194	0.0886	0.4652
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.3674	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.8045	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Pile Driver	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.0151	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.011	0.0000	0.0023
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.008	0.0000	0.0016
Total	64.439	137.713	16.729	0.150	6.432	32.931	5.877	6.981

SR47 4: Column Construction

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.305	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Concrete Truck	2.581	2.863	0.357	0.003	0.103	3.989	0.089	0.846
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.015	0.000
Total	27.793	50.945	6.535	0.057	2.328	55.851	2.113	11.840

SR47 4: Column Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.3046	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Concrete Truck	2.581	2.863	0.357	0.003	0.103	2.194	0.0886	0.4652
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.4022	0.0000
Worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.0151	0.0000
Total	27.793	50.945	6.535	0.057	2.328	30.718	2.113	6.512

Appendix G:

Table G6: Daily Emissions (Segmental) - Alternative 3 (continued)

SR47 5: Falsework

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
100 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Rough Terrain (f - lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.115	0.000
Scissor Lift	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Boom	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Total	56.770	101.321	14.171	0.114	6.083	51.861	5.567	10.995

SR47 5: Falsework

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
100 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Rough Terrain (f - lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.1153	0.0000
Scissor Lift	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.8045	0.0000
Boom	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.0323	0.0000
Total	56.770	101.321	14.171	0.114	6.083	28.524	5.567	6.047

SR47 6: Superstructure - Span Erection

Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Rough Terrain (f-lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.115	0.000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.219	0.000
Semi Truck	2.154	7.030	0.553	0.007	0.335	14.889	0.294	3.156
Flatbed	6.048	6.710	0.837	0.008	0.242	23.936	0.208	5.074
Pick Up	7.264	0.754	0.744	0.008	0.065	99.733	0.040	21.143
Concrete Truck	15.483	17.177	2.142	0.021	0.619	23.936	0.532	5.074
Concrete Pump Truck	25.378	81.616	8.310	0.085	2.973	0.000	2.735	0.000
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.609	0.000
Worker commute	9.686	1.005	0.992	0.011	0.086	0.000	0.054	0.000
Demolition	0.000	0.000	0.000	0.000	0.000	5.040	0.000	1.048
Excavation	0.000	0.000	0.000	0.000	0.000	0.504	0.000	0.105
grading	0.000	0.000	0.000	0.000	0.000	7.920	0.000	1.647
paving	0.000	0.000	0.393	0.000	0.000	0.000	0.000	0.000
Total	113.198	212.001	28.080	0.232	10.776	175.958	9.804	37.249

SR47 6: Superstructure - Span Erection

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Rough Terrain (f-lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.1153	0.0000
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.2185	0.0000
Semi Truck	2.154	7.030	0.553	0.007	0.335	8.189	0.2944	1.7360
Flatbed	6.048	6.710	0.837	0.008	0.242	13.165	0.2077	2.7909
Pick Up	7.264	0.754	0.744	0.008	0.065	54.853	0.0404	11.6289
Concrete Truck	15.483	17.177	2.142	0.021	0.619	13.165	0.5317	2.7909
Concrete Pump Truck	25.378	81.616	8.310	0.085	2.973	0.000	2.7348	0.0000
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.6090	0.0000
Worker commute	9.686	1.005	0.992	0.011	0.086	0.000	0.0538	0.0000
Demolition	0.000	0.000	0.000	0.000	0.000	1.613	0.0000	0.3355
Excavation	0.000	0.000	0.000	0.000	0.000	0.161	0.0000	0.0335
grading	0.000	0.000	0.000	0.000	0.000	2.534	0.0000	0.5272
paving	0.000	0.000	0.393	0.000	0.000	0.000	0.0000	0.0000
Total	113.198	212.001	28.080	0.232	10.776	93.680	9.804	19.843

Appendix G:

Table G6: Daily Emissions (Segmental) - Alternative 3 (continued)

SR47 7: Drainage
Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
Loader	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
Haulers (Truck)	4.032	4.473	0.558	0.005	0.161	7.979	0.138	1.691
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	6.048	6.710	0.837	0.008	0.242	23.936	0.208	5.074
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Vibratory Roller	6.836	13.065	2.000	0.012	0.918	0.000	0.845	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.995	0.044	0.423
Worker commute	4.649	0.482	0.476	0.005	0.041	0.000	0.026	0.000
Demolition	0.000	0.000	0.000	0.000	0.000	0.277	0.000	0.058
Excavation	0.000	0.000	0.000	0.000	0.000	0.259	0.000	0.054
grading	0.000	0.000	0.000	0.000	0.000	2.640	0.000	0.549
Paving	0.000	0.000	0.175	0.000	0.000	0.000	0.000	0.000
Soil dumping	0.000	0.000	0.000	0.000	0.000	0.008	0.000	0.002
Total	49.819	81.442	11.893	0.092	4.614	76.987	4.197	16.308

SR47 7: Drainage
Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	3.194	5.781	0.887	0.006	0.447	0.000	0.4114	0.0000
Loader	3.194	5.781	0.887	0.006	0.447	0.000	0.4114	0.0000
Haulers (Truck)	4.032	4.473	0.558	0.005	0.161	4.388	0.1385	0.9303
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Flatbed	6.048	6.710	0.837	0.008	0.242	13.165	0.2077	2.7909
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Vibratory Roller	6.836	13.065	2.000	0.012	0.918	0.000	0.8446	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.8045	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.097	0.0443	0.2326
Worker commute	4.649	0.482	0.476	0.005	0.041	0.000	0.0258	0.0000
Demolition	0.000	0.000	0.000	0.000	0.000	0.089	0.0000	0.0185
Excavation	0.000	0.000	0.000	0.000	0.000	0.083	0.0000	0.0172
grading	0.000	0.000	0.000	0.000	0.000	0.845	0.0000	0.1757
Paving	0.000	0.000	0.175	0.000	0.000	0.000	0.0000	0.0000
Soil dumping	0.000	0.000	0.000	0.000	0.000	0.003	0.0000	0.0005
Total	49.819	81.442	11.893	0.092	4.614	41.610	4.197	8.817

SR47 8: Retaining Walls and Soundwalls
Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
Haulers (Truck)	8.064	8.947	1.116	0.011	0.322	15.957	0.277	3.383
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	1.453	0.151	0.149	0.002	0.013	19.947	0.008	4.229
Vibratory Roller	6.836	13.065	2.000	0.012	0.918	0.000	0.845	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.995	0.044	0.423
Worker commute	4.262	0.442	0.437	0.005	0.038	0.000	0.024	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	1.050	0.000	0.218
Grading	0.000	0.000	0.000	0.000	0.000	5.280	0.000	1.098
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.919	0.000	0.191
Total	55.375	93.931	13.443	0.104	5.532	57.115	5.045	12.079

SR47 8: Retaining Walls and Soundwalls
Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
Haulers (Truck)	8.064	8.947	1.116	0.011	0.322	8.777	0.2769	1.8606
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	1.453	0.151	0.149	0.002	0.013	10.971	0.0081	2.3258
Vibratory Roller	6.836	13.065	2.000	0.012	0.918	0.000	0.8446	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.8045	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.097	0.0443	0.2326
Worker commute	4.262	0.442	0.437	0.005	0.038	0.000	0.0237	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.336	0.0000	0.0699
Grading	0.000	0.000	0.000	0.000	0.000	1.690	0.0000	0.3514
Soil Loading	0.000	0.000	0.000	0.000	0.000	0.294	0.0000	0.0612
Total	55.375	93.931	13.443	0.104	5.532	29.746	5.045	6.297

Appendix G:

Table G6: Daily Emissions (Segmental) - Alternative 3 (continued)

SR47 9: Striping, Lighting and Signing
Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Boom	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Loader	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.219	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Striper (Truck)	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.000	0.030	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.412	0.000	0.086
Total	44.488	81.465	11.196	0.095	4.338	52.274	3.961	11.080

SR47 9: Striping, Lighting and Signing
Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Boom	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Loader	3.194	5.781	0.887	0.006	0.447	0.000	0.4114	0.0000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.2185	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.582	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.8045	0.0000
Striper (Truck)	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Worker commute	5.424	0.563	0.556	0.006	0.048	0.000	0.0302	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.132	0.0000	0.0274
Total	44.488	81.465	11.196	0.095	4.338	28.656	3.961	6.074

SHB and SR-47: Stockpile Area
Emissions without watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Stock piles	0.000	0.000	0.000	0.000	0.000	79.8	0.0	16.6

SHB and SR-47: Stockpile Area
Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a da

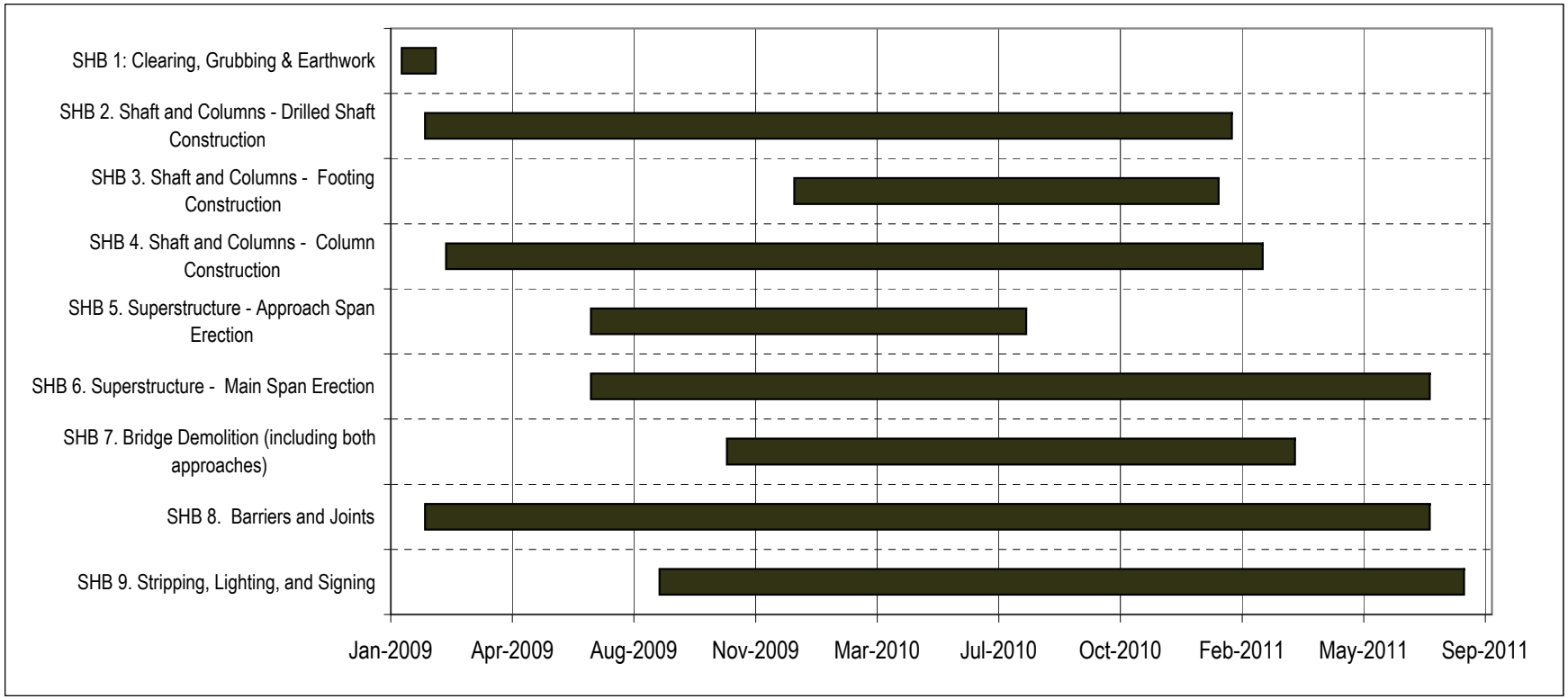
	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Stock piles	0.000	0.000	0.000	0.000	0.000	25.541	0.0000	5.3125

Note:
Stock pile areas were not specified or calculated for each construction phases. The maximum areas that might be covered each day by the whole project was used to calculate the total fugitive dust emissions from stock piles.

Appendix H
Construction Emission Calculations – Alternative 4, Segmental Method

Appendix H:

Table H1: Construction Schedule (Segmental) - Alternative 4



Source: DMJM Harris, May 2005

Appendix H:

Table H2: Maximum Construction Emissions (Segmental): By Source - Alternative 4

Maximum Daily Construction Emissions

		CO (lb/day)	NOx (lb/day)	ROG (lb/day)	SOx (lb/day)	PM_{10} (lb/day)	PM_{10} (lb/day)
With Watering to Control Fugitive Dust	Maximum Construction Equipment Exhaust	445	901	111	1.0	45	41
	Maximu Workers Commute	35	3.7	3.6	0.04	0.3	0.2
	Maximum Fugitive Dust	NA	NA	NA	NA	448	95
	Maximum Combined Daily Emissions	**480**	**905**	**115**	**1.0**	**493**	**136**
SCAQMD Thresholds		550	100	75	150	150	55
Exceeding Thresholds?		NO	YES	YES	NO	YES	YES

Note:The maximum daily emissions from equipment exhaust, fugitive dust, and workers commute are not additive because these worst case emissions do not always occur on the same day.

Appendix H:
Table H3. Summary of Daily Emissions (Segmental) - Alternative 4

		Total Emissions without Watering (lb/day)									
Construction Phases		**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**PM_{10} Fugitive**	**PM_{10} Total**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ Fugitive**	**$PM_{2.5}$ Total**
1	SHB 1: Clearing, Grubbing & Earthwork	7.34	8.24	1.38	0.01	0.55	8.98	9.52	0.49	1.90	2.40
2	SHB 2. Shaft and Columns - Drilled Shaft Construction	74.77	154.36	18.24	0.17	6.75	73.71	80.46	6.15	15.62	21.77
3	SHB 3. Shaft and Columns - Footing Construction	59.07	115.22	13.94	0.13	5.10	61.05	66.15	4.62	12.94	17.56
4	SHB 4. Shaft and Columns - Column Construction	33.75	72.38	8.61	0.08	3.10	33.91	37.01	2.83	7.19	10.01
6	SHB 5. Superstructure - Approach Span Erection	91.47	164.64	21.40	0.18	8.46	199.46	207.92	7.66	42.26	49.92
7	SHB 6. Superstructure - Main Span Erection	95.33	183.47	23.55	0.20	10.29	213.56	223.85	9.33	45.27	54.60
8	SHB 7. Bridge Demolition (including both approaches)	81.77	116.66	17.95	0.13	7.34	127.35	134.69	6.67	26.98	33.65
9	SHB 8. Barriers and Joints	7.51	5.89	0.97	0.01	0.25	17.68	17.94	0.21	3.75	3.96
10	SHB 9. Stripping, Lighting, and Signing	36.19	91.97	10.22	0.10	3.64	47.75	51.39	3.32	10.12	13.44
	SHB SR47 Stock Piles (entire project)	0.00	0.00	0.00	0.00	0.00	79.82	79.82	0.00	16.60	16.60
	Overlapping phases										
	2,3,4,5,6,7,8,9	480	905	115	1.0	45	854	899	41	181	222
	Max. Daily Emissions	**480**	**905**	**115**	**1.0**	**45**	**854**	**899**	**41**	**181**	**222**

Note:
1. Based on the construction schedule, emissions from overlapping construction phases were added together to evaluate the worst case scenarios. The maximum daily emissions represent the scenario of overlapping phases with the highest emissions.
2. Fugitive dust emissions from stock piles were not calculated for each construction phase. The emissions were calculated separately based on a maximum area that the stock piles will cover during the entire construction duration.
3. The fugitive dusts were assumed to be controlled by 68% by watering the site 3 times per day, and 45% by watering the unpaved roads 3 times a day, according to the control efficiencies in SCAQMD CEQA Air Quality Handbook Table 11-4.

Appendix H:
Table H3. Summary of Daily Emissions (Segmental) - Alter

		Total Emissions with Watering (lb/day)									
Construction Phases		**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**PM_{10} Fugitive**	**PM_{10} Total**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ Fugitive**	**$PM_{2.5}$ Total**
1	SHB 1: Clearing, Grubbing & Earthwork	7.34	8.24	1.38	0.01	0.55	4.94	5.48	0.49	1.63	2.12
2	SHB 2. Shaft and Columns - Drilled Shaft Construction	74.77	154.36	18.24	0.17	6.75	40.10	46.85	6.15	8.50	14.65
3	SHB 3. Shaft and Columns - Footing Construction	59.07	115.22	13.94	0.13	5.10	33.30	38.40	4.62	7.06	11.68
4	SHB 4. Shaft and Columns - Column Construction	33.75	72.38	8.61	0.08	3.10	18.65	21.75	2.83	3.95	6.78
6	SHB 5. Superstructure - Approach Span Erection	91.47	164.64	21.40	0.18	8.46	108.17	116.63	7.66	22.92	30.59
7	SHB 6. Superstructure - Main Span Erection	95.33	183.47	23.55	0.20	10.29	117.12	127.40	9.33	24.83	34.16
8	SHB 7. Bridge Demolition (including both approaches)	81.77	116.66	17.95	0.13	7.34	69.20	76.54	6.67	14.66	21.33
9	SHB 8. Barriers and Joints	7.51	5.89	0.97	0.01	0.25	9.73	9.98	0.21	2.06	2.27
10	SHB 9. Stripping, Lighting, and Signing	36.19	91.97	10.22	0.10	3.64	26.17	29.81	3.32	5.55	8.87
	SHB SR47 Stock Piles (entire project)	0.00	0.00	0.00	0.00	0.00	25.54	25.54	0.00	5.31	5.31
	Overlapping phases										
	2,3,4,5,6,7,8,9	480	905	115	1.0	45	448	493	41	95	136
	Max. Daily Emissions	**480**	**905**	**115**	**1.0**	**45**	**448**	**493**	**41**	**95**	**136**

Appendix H:
Table H3. Summary of Daily Emissions (Segmental) - Alter

		Construction Equipment Exhaust (lb/day)						Workers Commute (lb/day)					
Construction Phases		**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**$PM_{2.5}$ Exhaust**	**CO**	**NOx**	**ROG**	**SOx**	**PM_{10} Exhaust**	**$PM_{2.5}$ Exhaust**
1	SHB 1: Clearing, Grubbing & Earthwork	5.79	8.08	1.23	0.01	0.53	0.48	1.550	0.161	0.159	0.002	0.014	0.009
2	SHB 2. Shaft and Columns - Drilled Shaft Construction	69.34	153.79	17.68	0.17	6.70	6.12	5.424	0.563	0.556	0.006	0.048	0.030
3	SHB 3. Shaft and Columns - Footing Construction	56.76	114.97	13.69	0.13	5.08	4.61	2.314	0.257	0.256	0.003	0.024	0.015
4	SHB 4. Shaft and Columns - Column Construction	31.04	72.10	8.33	0.08	3.08	2.81	2.712	0.281	0.278	0.003	0.024	0.015
6	SHB 5. Superstructure - Approach Span Erection	85.66	164.03	20.80	0.18	8.41	7.63	5.811	0.603	0.595	0.006	0.052	0.032
7	SHB 6. Superstructure - Main Span Erection	89.52	182.87	22.95	0.19	10.23	9.30	5.811	0.603	0.595	0.006	0.052	0.032
8	SHB 7. Bridge Demolition (including both approaches)	75.58	116.02	17.32	0.13	7.29	6.63	6.199	0.643	0.635	0.007	0.055	0.034
9	SHB 8. Barriers and Joints	4.41	5.57	0.66	0.01	0.22	0.19	3.099	0.322	0.318	0.003	0.028	0.017
10	SHB 9. Stripping, Lighting, and Signing	32.32	91.56	9.83	0.10	3.60	3.30	3.874	0.402	0.397	0.004	0.034	0.022
	SHB SR47 Stock Piles (entire project)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Overlapping phases												
	2,3,4,5,6,7,8,9	445	901	111	1.0	45	41	35	3.67	3.63	0.04	0.32	0.20
	Max. Daily Emissions	**445**	**901**	**111**	**1.0**	**45**	**41**	**35**	**3.67**	**3.63**	**0.04**	**0.32**	**0.20**

Appendix H:

Table H4: Construction Equipment Usage (Segmental) - Alternative 4

Schuyler Heim Bridge (SHB)

SHB 1: Clearing, Grubbing & Earthwork

Construction duration from 1/11/2009 to 2/11/2009 This work will occur in stages as work areas become available.

Number of construction workers 4 Round trip distance per worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe/excavator	NA	1	1	20	8	160	8	NA	NA	NA	NA
Pick Up	NA	1	1	20	4	80	NA	60	1	5	55
Haul Truck	NA	1	1	20	4	80	NA	50	2	4	46
worker commute	NA	4	NA	NA	NA	NA	NA	40	1	0	40

SHB 2. Shaft and Columns - Drilled Shaft Construction

Construction duration from 2/1/2009 to 2/1/2011

Number of construction workers 14 Round trip distance per worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**CIDH**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per CIDH**	**per CIDH**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
200 ton crane	NA	2	87	10	80	13920	8	NA	NA	NA	NA
Caisson Drill	NA	1	87	4	32	2784	8	NA	NA	NA	NA
200 ton gantry	NA	2	87	7	56	9744	8	NA	NA	NA	NA
Generator	NA	2	87	10	80	13920	8	NA	NA	NA	NA
Flatbed	NA	2	87	8	64	11136	NA	50	1.5	6	44
Pick Up	NA	4	87	10	80	27840	NA	50	1.5	10	40
Concrete Truck	NA	10	87	3	24	20880	NA	32	2	2	30
Concrete Pump Truck	NA	2	87	3	24	4176	8	NA	NA	NA	NA
Compressor	NA	2	87	10	80	13920	8	NA	NA	NA	NA
Water Truck	NA	1	87	4	32	2784	8	NA	NA	NA	NA
worker commute	NA	14	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	3848	40	ft^3	290
Soil loading	333	47.5	yd^3	7.0

Appendix H:

Table H4: Construction Equipment Usage (Segmental) - Alternative 4 (continued)

SHB 3. Shaft and Columns - Footing Construction

Construction duration from 1/1/2010 to 1/20/2011

Number of construction workers 7 Round trip distance per worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Embank. Wall**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per Wall**	**per Wall**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Backhoe/excavator	NA	2	2	5	40	160	8	NA	NA	NA	NA
200 ton crane	NA	1	2	2	16	32	8	NA	NA	NA	NA
Generator	NA	1	2	10	80	160	8	NA	NA	NA	NA
Haul Truck	NA	4	2	5	40	320	NA	50	2	4	46
Pick Up	NA	2	2	10	80	320	NA	50	1.5	10	40
Concrete Truck	NA	12	2	3	24	576	NA	32	2	2	30
Concrete Pump Truck	NA	2	2	3	24	96	8	NA	NA	NA	NA
Compressor	NA	1	2	10	80	160	8	NA	NA	NA	NA
Water Truck	NA	1	2	4	32	64	8	NA	NA	NA	NA
worker commute	NA	7	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	2400	86	ft^3	28
Soil loading	207	30	yd^3	7

SHB 4. Shaft and Columns - Column Construction

Construction duration from 2/20/2009 to 3/1/2011

Number of construction workers 7 Round trip distance per worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Columns**	**work days**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**(Ea.)**	**per Col.**	**per Col.**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
140 ton crane		1	87	1	8	696	8	NA	NA	NA	NA
Generator	NA	1	87	4	32	2784	8	NA	NA	NA	NA
Flatbed	NA	1	87	2.5	20	1740	NA	50	1.5	6	44
Pick Up	NA	2	87	4	32	5568	NA	50	1.5	10	40
Concrete Truck	NA	4	87	2	16	5568	NA	32	2	2	30
Concrete Pump Truck	NA	2	87	2	16	2784	8	NA	NA	NA	NA
Compressor	NA	1	87	4	32	2784	8	NA	NA	NA	NA
worker commute	NA	7	NA	NA	NA	NA	NA	40	1	0	40

Appendix H:

Table H4: Construction Equipment Usage (Segmental) - Alternative 4 (continued)

SHB 5. Superstructure - Approach Span Erection

Construction duration from 7/1/2009 to 7/30/2010

Number of construction workers 15 Round trip distance per worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
275 ton crane	NA	1	18	360	2880	2880	8	NA	NA	NA	NA
Rough Terrain (f-lift)	NA	2	20	400	3200	6400	8	NA	NA	NA	NA
200 ton gantry	NA	1	20	400	3200	3200	8	NA	NA	NA	NA
Generator	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
Semi Truck	NA	10	10	200	1600	16000	NA	42	1	2	40
Flatbed	NA	6	12	240	1920	11520	NA	50	1.5	6	44
Pick Up	NA	10	20	400	3200	32000	NA	50	1.5	10	40
Concrete Truck	NA	10	10	200	1600	16000	NA	32	2	2	30
Concrete Pump Truck	NA	2	10	200	1600	3200	8	NA	NA	NA	NA
Compressor	NA	4	20	400	3200	12800	8	NA	NA	NA	NA
worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	127340	2122	ft^3	60
Grading	2	0.1	acre	20
Soil loading	1572	79	yd^3	20

SHB 6. Superstructure - Main Span Erection

Construction duration from 7/1/2009 to 7/30/2011

Number of construction workers 15 Round trip distance per worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
400 ton crane	NA	2	10	200	1600	3200	8	NA	NA	NA	NA
Rough Terrain (f-lift)	NA	4	10	200	1600	6400	8	NA	NA	NA	NA
200 ton gantry	NA	2	14	280	2240	4480	8	NA	NA	NA	NA
Generator	NA	3	20	400	3200	9600	8	NA	NA	NA	NA
Semi Truck	NA	20	10	200	1600	32000	NA	42	1	2	40
Flatbed	NA	6	18	360	2880	17280	NA	50	1.5	6	44
Pick Up	NA	10	18	360	2880	28800	NA	50	1.5	10	40
Concrete Truck	NA	1	5	50	400	400	NA	32	2	2	30
Concrete Pump Truck	NA	1	5	50	400	400	8	NA	NA	NA	NA
Compressor	NA	3	20	400	3200	9600	8	NA	NA	NA	NA
Loader	NA	2	1	20	160	320	8	NA	NA	NA	NA
worker commute	NA	15	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Excavation	11550	192.5	ft^3	60
Grading	1.5	0.1	acre	30
Soil loading	42.8	2	yd^3	20

Appendix H:

SHB 7. Bridge Demolition (including both approaches)

Construction duration from 11/1/2009 to 3/30/2011

Number of construction workers 16 Round trip distance per worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Pick Up	NA	6	6	120	3	2160	NA	50	1.5	10	40
Haul Truck	NA	10	6	120	4	4800	NA	50	2	4	46
Compressor	NA	4	6	120	8	3840	8	NA	NA	NA	NA
Generator	NA	4	6	120	6	2880	8	NA	NA	NA	NA
Flatbed	NA	4	6	120	3	1440	NA	50	1.5	6	44
Backhoe/excavator	NA	4	6	120	8	3840	8	NA	NA	NA	NA
Loader	NA	3	6	120	4	1440	8	NA	NA	NA	NA
worker commute	NA	16	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
Demolition	62500	391	ft^3	160
Excavation	40300	672	ft^4	60
Grading	2	0.1	acre	20
Soil loading	299	15	yd^3	20

Appendix H:

Table H4: Construction Equipment Usage (Segmental) - Alternative 4 (continued)

SHB 8. Barriers and Joints

Construction duration from 2/1/2009 to 7/30/2011

Number of construction workers 8 Round trip distance per worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Pick Up	NA	1	4	80	320	320	NA	50	1	6	44
Concrete Trucks	NA	2	4	80	640	1280	NA	32	2	2	30
Flatbed Truck	NA	1	4	80	320	320	NA	40	1	4	36
Semi Truck	NA	1	4	80	320	320	NA	42	1	2	40
worker commute	NA	8	NA	NA	NA	NA	NA	40	1	0	40

SHB 9. Stripping, Lighting, and Signing

Construction duration from 9/1/2009 to 8/30/2011

Number of construction workers 10 Round trip distance per worker 40

	All Equipment							Per Truck			
Equipment Description	**HP rating**	**Units**	**Project**	**work**	**hours**	**total time**	**Maximum daily hours**	**Miles per round trip**	**Daily roundtrips**	**Miles on unpaved road**	**Miles on paved road**
		(Ea.)	**Time (mo)**	**days**	**(hrs)**	**(hrs)**	**(hrs/day)**	**Miles/RT**	**RT/day**	**miles/day**	**miles/day**
Pick Up	NA	4	1.5	30	3	360	NA	50	1.5	10	40
Paint truck	NA	1	1	20	7	140	8	NA	NA	NA	NA
Compressor	NA	1	1	20	7	140	8	NA	NA	NA	NA
Bucket Truck	NA	2	1.5	30	5	300	8	NA	NA	NA	NA
Semi Truck	NA	2	0.5	10	4	80	NA	42	1	2	40
Boom Truck	NA	1	0.5	10	6	60	8	NA	NA	NA	NA
worker commute	NA	10	NA	NA	NA	NA	NA	40	1	0	40

	Total Amount	**Daily Amount**	**Unit**	**duration**
excavation	29452	982	ft^3	30

SHB: Stockpile Area

Construction duration from 1/11/2009 to 8/30/2011

	Maximum Area Covered	**Unit**
Stock Piles	2	acres/day

1. Construction data provided by DMJM Harris, May 2005
2. Stock pile areas were not specified for each construction phases. The maximum areas that might be covered each day by the whole project was used to calculate the total fugitive dust emissions from stock piles.

Appendix H:

Table H5: Emission Factors (Segmental) - Alternative 4

SHB 1: Clearing, Grubbing & Earthwork

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe/excavator	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.000011	0.000086	0.997	0.000	0.211
Haul Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.000011	0.000086	0.997	0.000	0.211

SHB 2. Shaft and Columns - Drilled Shaft Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
200 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Caisson Drill	Bore/Drill Rigs	2009	lb/hr	0.520	1.229	0.116	0.002	0.054	0.000	0.050	0.000
200 ton gantry	Other Construction Equipmer	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.043	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.000011	0.000086	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Water Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.000011	0.000086	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Soil loading	Soil loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

Table H5: Emission Factors (Segmental) - Alternative 4 (continued)

SHB 3. Shaft and Columns - Footing Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Backhoe/excavator	Tractors/Loaders/Backhoes	2010	lb/hr	0.393	0.675	0.102	0.001	0.052	0.000	0.048	0.000
200 ton crane	Cranes	2010	lb/hr	0.543	1.451	0.159	0.001	0.064	0.000	0.059	0.000
Generator	Generator Sets	2010	lb/hr	0.329	0.644	0.096	0.001	0.040	0.000	0.036	0.000
Haul Truck	On-road Delivery	2010	lb/VMT	0.018	0.021	0.003	0.00003	0.00075	0.997	0.001	0.211
Pick Up	On-road passenger	2010	lb/VMT	0.008	0.001	0.001	0.000011	0.000087	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2010	lb/VMT	0.018	0.021	0.003	0.00003	0.00075	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2010	lb/hr	0.743	2.388	0.248	0.003	0.088	0.000	0.081	0.000
Compressor	Air compressor	2010	lb/hr	0.361	0.732	0.112	0.001	0.053	0.000	0.048	0.000
Water Truck	Off-Highway Trucks	2010	lb/hr	0.743	2.388	0.248	0.003	0.088	0.000	0.081	0.000
worker commute	On-road passenger	2010	lb/VMT	0.008	0.001	0.001	0.000011	0.000087	0.997	0.000	0.211
Excavation	Excavation	2010	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Soil loading	Soil loading	2010	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

SHB 4. Shaft and Columns - Column Construction

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
140 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.000011	0.000086	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.000011	0.000086	0.997	0.000	0.211

Appendix H:

Table H5: Emission Factors (Segmental) - Alternative 4 (continued)

SHB 5. Superstructure - Approach Span Erection

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
275 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Rough Terrain (f-lift)	Rough Terrain Forklifts	2009	lb/hr	0.482	0.851	0.137	0.001	0.072	0.000	0.066	0.000
200 ton gantry	Other Construction Equipmer	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.043	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.002	1.861	0.002	0.395
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.000011	0.000086	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.000011	0.000086	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Soil loading	Soil loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

SHB 6. Superstructure - Main Span Erection

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
400 ton crane	Cranes	2009	lb/hr	0.571	1.529	0.168	0.001	0.068	0.000	0.062	0.000
Rough Terrain (f-lift)	Rough Terrain Forklifts	2009	lb/hr	0.482	0.851	0.137	0.001	0.072	0.000	0.066	0.000
200 ton gantry	Other Construction Equipmer	2009	lb/hr	0.429	1.081	0.113	0.001	0.047	0.000	0.043	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.002	1.861	0.002	0.395
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.000011	0.000086	0.997	0.000	0.211
Concrete Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Concrete Pump Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.000011	0.000086	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Soil loading	Soil loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008

Appendix H:

SHB 7. Bridge Demolition (including both approaches)

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.000011	0.000086	0.997	0.000	0.211
Haul Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Generator	Generator Sets	2009	lb/hr	0.338	0.672	0.102	0.001	0.041	0.000	0.038	0.000
Flatbed	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.997	0.001	0.211
Backhoe/excavator	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
Loader	Tractors/Loaders/Backhoes	2009	lb/hr	0.399	0.723	0.111	0.001	0.056	0.000	0.051	0.000
worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.000011	0.000086	0.997	0.000	0.211
Demolition	Demolition	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000
Grading	Grading	2009	lb/acre/day	0.000	0.000	0.000	0.000	0.000	26.400	0.000	5.491
Soil loading	Soil loading	2009	lbs/yd3	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.008
Stock piles											

Appendix H:

Table H5: Emission Factors (Segmental) - Alternative 4 (continued)

SHB 8. Barriers and Joints

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.000011	0.000086	0.9973	0.000	0.211
Concrete Trucks	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.9973	0.001	0.211
Flatbed Truck	On-road Delivery	2009	lb/VMT	0.020	0.022	0.003	0.00003	0.00081	0.9973	0.001	0.211
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.002	1.8611	0.002	0.395
worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.000011	0.000086	0.9973	0.000	0.211

SHB 9. Stripping, Lighting, and Signing

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Pick Up	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.000011	0.000086	0.997	0.000	0.211
Paint truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Compressor	Air compressor	2009	lb/hr	0.370	0.766	0.118	0.001	0.055	0.000	0.050	0.000
Bucket Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
Semi Truck	On-road HHDT	2009	lb/VMT	0.013	0.042	0.003	0.00004	0.002	1.861	0.002	0.395
Boom Truck	Off-Highway Trucks	2009	lb/hr	0.793	2.551	0.260	0.003	0.093	0.000	0.085	0.000
worker commute	On-road passenger	2009	lb/VMT	0.010	0.001	0.001	0.000011	0.000086	0.997	0.000	0.211
Excavation	Excavation	2009	lb/ft3/day	0.000	0.000	0.000	0.000	0.000	0.00042	0.000	0.000

SHB: Stockpile Area

Emission Factors (see Appendix I for details and reference of emission factors)

	Equipment type	Construction year	Emission factor unit	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Stock piles	Stock piles	All	lb/acre/day	0.000	0.000	0.000	0.000	0.000	39.90780	0.000	8.301

Note:

1. Stock pile areas were not specified or calculated for each construction phases. The maximum areas that might be covered each day by the whole project was used to calculate the total fugitive dust emissions from stock piles.
2. Detailed references of the emission factors are in Appendix I.

Appendix H:

Table H6: Daily Emissions (Segmental) - Alternative 4

SHB 1: Clearing, Grubbing & Earthwork

Emissions without Watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.194	5.781	0.887	0.006	0.447	0.000	0.411	0.000
Pick Up	0.581	0.060	0.060	0.001	0.005	4.987	0.003	1.057
Haul Truck	2.016	2.237	0.279	0.003	0.081	3.989	0.069	0.846
worker commute	1.550	0.161	0.159	0.002	0.014	0.000	0.009	0.000
Total	7.341	8.239	1.384	0.011	0.547	8.976	0.493	1.903

SHB 1: Clearing, Grubbing & Earthwork

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	3.1943	5.7812	0.8869	0.0062	0.4472	0.0000	0.4114	0.5814
Pick Up	0.5811	0.0603	0.0595	0.0006	0.0052	2.7427	0.0032	0.5814
Haul Truck	2.0161	2.2366	0.2789	0.0027	0.0805	2.1941	0.0692	0.4652
worker commute	1.5497	0.1608	0.1588	0.0017	0.0138	0.0000	0.0086	0.0000
Total	7.3412	8.2390	1.3841	0.0112	0.5467	4.9368	0.4925	1.6280

0

SHB 2. Shaft and Columns - Drilled Shaft Construction

Emissions without Watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
200 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.998	0.000
Caisson Drill	4.160	9.830	0.929	0.014	0.432	0.000	0.398	0.000
200 ton gantry	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Generator	5.406	10.749	1.632	0.011	0.662	0.000	0.609	0.000
Flatbed	3.024	3.355	0.418	0.004	0.121	11.968	0.104	2.537
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Concrete Truck	12.903	14.314	1.785	0.017	0.516	19.947	0.443	4.229
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Compressor	5.918	12.262	1.887	0.011	0.874	0.000	0.804	0.000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
worker commute	5.424	0.563	0.556	0.006	0.048	0.000	0.030	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.017	0.000	0.003
Soil loading	0.000	0.000	0.000	0.000	0.000	1.886	0.000	0.392
Total	74.768	154.356	18.239	0.173	6.747	73.710	6.147	15.619

SHB 2. Shaft and Columns - Drilled Shaft Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
200 ton crane	9.128	24.470	2.693	0.022	1.085	0.0000	0.9980	0.0000
Caisson Drill	4.160	9.830	0.929	0.014	0.432	0.0000	0.3979	0.0000
200 ton gantry	6.866	17.299	1.808	0.020	0.753	0.0000	0.6932	0.0000
Generator	5.406	10.749	1.632	0.011	0.662	0.0000	0.6093	0.0000
Flatbed	3.024	3.355	0.418	0.004	0.121	6.5824	0.1038	1.3955
Pick Up	2.906	0.302	0.298	0.003	0.026	21.9413	0.0162	4.6516
Concrete Truck	12.903	14.314	1.785	0.017	0.516	10.9707	0.4431	2.3258
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.0000	1.3674	0.0000
Compressor	5.918	12.262	1.887	0.011	0.874	0.0000	0.8045	0.0000
Water Truck	6.344	20.404	2.077	0.021	0.743	0.0000	0.6837	0.0000
worker commute	5.424	0.563	0.556	0.006	0.048	0.0000	0.0302	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.0054	0.0000	0.0011
Soil loading	0.000	0.000	0.000	0.000	0.000	0.6034	0.0000	0.1255
Total	74.768	154.356	18.239	0.173	6.747	40.103	6.147	8.499

Appendix H:

Table H6: Daily Emissions (Segmental) - Alternative 4 (continued)

SHB 3. Shaft and Columns - Footing Construction

Emissions without Watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	6.287	10.796	1.633	0.012	0.833	0.000	0.766	0.000
200 ton crane	4.345	11.612	1.275	0.011	0.514	0.000	0.473	0.000
Generator	2.634	5.152	0.769	0.006	0.317	0.000	0.292	0.000
Haul Truck	7.375	8.250	1.036	0.011	0.300	15.957	0.257	3.383
Pick Up	1.239	0.138	0.137	0.002	0.013	19.947	0.008	4.229
Concrete Truck	14.160	15.840	1.989	0.021	0.577	23.936	0.493	5.074
Concrete Pump Truck	11.886	38.216	3.968	0.043	1.400	0.000	1.288	0.000
Compressor	2.890	5.856	0.896	0.006	0.421	0.000	0.387	0.000
Water Truck	5.943	19.108	1.984	0.021	0.700	0.000	0.644	0.000
worker commute	2.314	0.257	0.256	0.003	0.024	0.000	0.015	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.036	0.000	0.007
Soil loading	0.000	0.000	0.000	0.000	0.000	1.176	0.000	0.245
Total	59.074	115.225	13.943	0.135	5.100	61.052	4.624	12.938

SHB 3. Shaft and Columns - Footing Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Backhoe/excavator	6.287	10.796	1.633	0.012	0.833	0.0000	0.7662	0.0000
200 ton crane	4.345	11.612	1.275	0.011	0.514	0.0000	0.4726	0.0000
Generator	2.634	5.152	0.769	0.006	0.317	0.0000	0.2917	0.0000
Haul Truck	7.375	8.250	1.036	0.011	0.300	8.7765	0.2569	1.8606
Pick Up	1.239	0.138	0.137	0.002	0.013	10.9707	0.0082	2.3258
Concrete Truck	14.160	15.840	1.989	0.021	0.577	13.1648	0.4933	2.7909
Concrete Pump Truck	11.886	38.216	3.968	0.043	1.400	0.0000	1.2881	0.0000
Compressor	2.890	5.856	0.896	0.006	0.421	0.0000	0.3874	0.0000
Water Truck	5.943	19.108	1.984	0.021	0.700	0.0000	0.6441	0.0000
worker commute	2.314	0.257	0.256	0.003	0.024	0.0000	0.0153	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.0115	0.0000	0.0024
Soil loading	0.000	0.000	0.000	0.000	0.000	0.3763	0.0000	0.0783
Total	59.074	115.225	13.943	0.135	5.100	33.300	4.624	7.058

SHB 4. Shaft and Columns - Column Construction

Emissions without Watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.305	0.000
Flatbed	1.512	1.677	0.209	0.002	0.060	5.984	0.052	1.269
Pick Up	1.453	0.151	0.149	0.002	0.013	19.947	0.008	4.229
Concrete Truck	5.161	5.726	0.714	0.007	0.206	7.979	0.177	1.691
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.015	0.000
Total	33.753	72.384	8.611	0.078	3.101	33.909	2.826	7.189

SHB 4. Shaft and Columns - Column Construction

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
140 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Generator	2.703	5.375	0.816	0.006	0.331	0.000	0.3046	0.0000
Flatbed	1.512	1.677	0.209	0.002	0.060	3.291	0.0519	0.6977
Pick Up	1.453	0.151	0.149	0.002	0.013	10.971	0.0081	2.3258
Concrete Truck	5.161	5.726	0.714	0.007	0.206	4.388	0.1772	0.9303
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.3674	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.4022	0.0000
worker commute	2.712	0.281	0.278	0.003	0.024	0.000	0.0151	0.0000
Total	33.753	72.384	8.611	0.078	3.101	18.650	2.826	3.954

Appendix H:

Table H6: Daily Emissions (Segmental) - Alternative 4 (continued)

SHB 5. Superstructure - Approach Span Erection

Emissions without Watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.499	0.000
Rough Terrain (f-lift)	7.704	13.608	2.188	0.013	1.150	0.000	1.058	0.000
200 ton gantry	3.433	8.650	0.904	0.010	0.377	0.000	0.347	0.000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.219	0.000
Semi Truck	5.385	17.575	1.383	0.017	0.838	37.222	0.736	7.891
Flatbed	9.072	10.065	1.255	0.012	0.362	35.904	0.312	7.612
Pick Up	7.264	0.754	0.744	0.008	0.065	99.733	0.040	21.143
Concrete Truck	12.903	14.314	1.785	0.017	0.516	19.947	0.443	4.229
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.609	0.000
worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.891	0.000	0.185
Grading	0.000	0.000	0.000	0.000	0.000	2.640	0.000	0.549
Soil loading	0.000	0.000	0.000	0.000	0.000	3.120	0.000	0.649
Total	91.475	164.635	21.396	0.182	8.461	199.457	7.661	42.258

0

SHB 5. Superstructure - Approach Span Erection

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
275 ton crane	4.564	12.235	1.347	0.011	0.542	0.000	0.4990	0.0000
Rough Terrain (f-lift)	7.704	13.608	2.188	0.013	1.150	0.000	1.0576	0.0000
200 ton gantry	3.433	8.650	0.904	0.010	0.377	0.000	0.3466	0.0000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.2185	0.0000
Semi Truck	5.385	17.575	1.383	0.017	0.838	20.472	0.7360	4.3401
Flatbed	9.072	10.065	1.255	0.012	0.362	19.747	0.3115	4.1864
Pick Up	7.264	0.754	0.744	0.008	0.065	54.853	0.0404	11.6289
Concrete Truck	12.903	14.314	1.785	0.017	0.516	10.971	0.4431	2.3258
Concrete Pump Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.3674	0.0000
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.6090	0.0000
worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.0323	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.285	0.0000	0.0593
Grading	0.000	0.000	0.000	0.000	0.000	0.845	0.0000	0.1757
Soil loading	0.000	0.000	0.000	0.000	0.000	0.998	0.0000	0.2077
Total	91.475	164.635	21.396	0.182	8.461	108.172	7.661	22.924

SHB 6. Superstructure - Main Span Erection

Emissions without Watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
400 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.998	0.000
Rough Terrain (f-lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.115	0.000
200 ton gantry	6.866	17.299	1.808	0.020	0.753	0.000	0.693	0.000
Generator	8.108	16.124	2.448	0.017	0.993	0.000	0.914	0.000
Semi Truck	10.771	35.151	2.766	0.034	1.676	74.444	1.472	15.782
Flatbed	9.072	10.065	1.255	0.012	0.362	35.904	0.312	7.612
Pick Up	7.264	0.754	0.744	0.008	0.065	99.733	0.040	21.143
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.995	0.044	0.423
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	8.878	18.393	2.831	0.017	1.312	0.000	1.207	0.000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.823	0.000
worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.032	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.081	0.000	0.017
Grading	0.000	0.000	0.000	0.000	0.000	1.320	0.000	0.275
Soil loading	0.000	0.000	0.000	0.000	0.000	0.085	0.000	0.018
Total	95.331	183.473	23.548	0.198	10.287	213.561	9.334	45.269

SHB 6. Superstructure - Main Span Erection

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
400 ton crane	9.128	24.470	2.693	0.022	1.085	0.000	0.9980	0.0000
Rough Terrain (f-lift)	15.408	27.216	4.377	0.026	2.299	0.000	2.1153	0.0000
200 ton gantry	6.866	17.299	1.808	0.020	0.753	0.000	0.6932	0.0000
Generator	8.108	16.124	2.448	0.017	0.993	0.000	0.9139	0.0000
Semi Truck	10.771	35.151	2.766	0.034	1.676	40.944	1.4719	8.6801
Flatbed	9.072	10.065	1.255	0.012	0.362	19.747	0.3115	4.1864
Pick Up	7.264	0.754	0.744	0.008	0.065	54.853	0.0404	11.6289
Concrete Truck	1.290	1.431	0.178	0.002	0.052	1.097	0.0443	0.2326
Concrete Pump Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	8.878	18.393	2.831	0.017	1.312	0.000	1.2067	0.0000
Loader	6.389	11.562	1.774	0.012	0.894	0.000	0.8229	0.0000
worker commute	5.811	0.603	0.595	0.006	0.052	0.000	0.0323	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.026	0.0000	0.0054
Grading	0.000	0.000	0.000	0.000	0.000	0.422	0.0000	0.0879
Soil loading	0.000	0.000	0.000	0.000	0.000	0.027	0.0000	0.0057
Total	95.331	183.473	23.548	0.198	10.287	117.117	9.334	24.827

Appendix H:

SHB 7. Bridge Demolition (including both approaches)

Emissions without Watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	4.359	0.452	0.447	0.005	0.039	59.840	0.024	12.686
Haul Truck	20.161	22.366	2.789	0.027	0.805	39.893	0.692	8.457
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.609	0.000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.219	0.000
Flatbed	6.048	6.710	0.837	0.008	0.242	23.936	0.208	5.074
Backhoe/excavator	12.777	23.125	3.547	0.025	1.789	0.000	1.646	0.000
Loader	9.583	17.344	2.661	0.019	1.342	0.000	1.234	0.000
worker commute	6.199	0.643	0.635	0.007	0.055	0.000	0.034	0.000
Demolition	0.000	0.000	0.000	0.000	0.000	0.164	0.000	0.034
Excavation	0.000	0.000	0.000	0.000	0.000	0.282	0.000	0.059
Grading	0.000	0.000	0.000	0.000	0.000	2.640	0.000	0.549
Soil loading	0.000	0.000	0.000	0.000	0.000	0.592	0.000	0.123
Total	81.775	116.663	17.954	0.135	7.345	127.348	6.666	26.983

SHB 7. Bridge Demolition (including both approaches)

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	4.359	0.452	0.447	0.005	0.039	32.912	0.0242	6.9773
Haul Truck	20.161	22.366	2.789	0.027	0.805	21.941	0.6923	4.6516
Compressor	11.837	24.524	3.774	0.023	1.749	0.000	1.6090	0.0000
Generator	10.811	21.498	3.264	0.022	1.324	0.000	1.2185	0.0000
Flatbed	6.048	6.710	0.837	0.008	0.242	13.165	0.2077	2.7909
Backhoe/excavator	12.777	23.125	3.547	0.025	1.789	0.000	1.6457	0.0000
Loader	9.583	17.344	2.661	0.019	1.342	0.000	1.2343	0.0000
worker commute	6.199	0.643	0.635	0.007	0.055	0.000	0.0345	0.0000
Demolition	0.000	0.000	0.000	0.000	0.000	0.053	0.0000	0.0109
Excavation	0.000	0.000	0.000	0.000	0.000	0.090	0.0000	0.0188
Grading	0.000	0.000	0.000	0.000	0.000	0.845	0.0000	0.1757
Soil loading	0.000	0.000	0.000	0.000	0.000	0.190	0.0000	0.0394
Total	81.775	116.663	17.954	0.135	7.345	69.195	6.666	14.665

Appendix H:

Table H6: Daily Emissions (Segmental) - Alternative 4 (continued)

SHB 8. Barriers and Joints

Emissions without Watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	0.484	0.050	0.050	0.001	0.004	5.984	0.003	1.269
Concrete Trucks	2.581	2.863	0.357	0.003	0.103	3.989	0.089	0.846
Flatbed Truck	0.806	0.895	0.112	0.001	0.032	3.989	0.028	0.846
Semi Truck	0.539	1.758	0.138	0.002	0.084	3.722	0.074	0.789
worker commute	3.099	0.322	0.318	0.003	0.028	0.000	0.017	0.000
Total	7.509	5.887	0.974	0.010	0.251	17.685	0.210	3.749

SHB 8. Barriers and Joints

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	0.484	0.050	0.050	0.001	0.004	3.291	0.0027	0.6977
Concrete Trucks	2.581	2.863	0.357	0.003	0.103	2.194	0.0886	0.4652
Flatbed Truck	0.806	0.895	0.112	0.001	0.032	2.194	0.0277	0.4652
Semi Truck	0.539	1.758	0.138	0.002	0.084	2.047	0.0736	0.4340
worker commute	3.099	0.322	0.318	0.003	0.028	0.000	0.0172	0.0000
Total	7.509	5.887	0.974	0.010	0.251	9.727	0.210	2.062

SHB 9. Stripping, Lighting, and Signing

Emissions without Watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	2.906	0.302	0.298	0.003	0.026	39.893	0.016	8.457
Paint truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.402	0.000
Bucket Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.367	0.000
Semi Truck	1.077	3.515	0.277	0.003	0.168	7.444	0.147	1.578
Boom Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.684	0.000
worker commute	3.874	0.402	0.397	0.004	0.034	0.000	0.022	0.000
Excavation	0.000	0.000	0.000	0.000	0.000	0.412	0.000	0.086
Total	36.194	91.966	10.225	0.102	3.638	47.750	3.322	10.121

SHB 9. Stripping, Lighting, and Signing

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pick Up	2.906	0.302	0.298	0.003	0.026	21.941	0.0162	4.6516
Paint truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
Compressor	2.959	6.131	0.944	0.006	0.437	0.000	0.4022	0.0000
Bucket Truck	12.689	40.808	4.155	0.043	1.486	0.000	1.3674	0.0000
Semi Truck	1.077	3.515	0.277	0.003	0.168	4.094	0.1472	0.8680
Boom Truck	6.344	20.404	2.077	0.021	0.743	0.000	0.6837	0.0000
worker commute	3.874	0.402	0.397	0.004	0.034	0.000	0.0215	0.0000
Excavation	0.000	0.000	0.000	0.000	0.000	0.132	0.0000	0.0274
Total	36.194	91.966	10.225	0.102	3.638	26.168	3.322	5.547

SHB: Stockpile Area

Emissions without Watering

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Stock piles	0.000	0.000	0.000	0.000	0.000	79.8	0.0	16.6

SHB: Stockpile Area

Emissions with watering (fugitive dust reduction by 45% to 68% by watering the site and unpaved roads 3 times a day)

	CO	NOx	ROG	SOx	PM_{10} Exhaust	PM_{10} Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Fugitive
Stock piles	0.000	0.000	0.000	0.000	0.000	25.541	0.0000	5.3125

Note:

Stock pile areas were not specified or calculated for each construction phases. The maximum areas that might be covered each day by the whole project was used to calculate the total fugitive dust emissions from stock piles.

Appendix I
Construction Emission Calculations – Emission Factor Summary

Appendix I:

Table I1: Light to Mid Duty Vehicles Emission Factors

Highest (Most Conservative) EMFAC2007 (version 2.3)
Emission Factors for On-Road Passenger Vehicles & Delivery Trucks

Projects in the SCAQMD (Scenario Years 2007 - 2026)
Derived from Peak Emissions Inventory (**Winter**, **Annual**, **Summer**)

Vehicle Class:
Passenger Vehicles (<8500 pounds) & Delivery Trucks (>8500 pounds)

Passenger Vehicles	Year	CO	NOx	ROG	SOx	PM_{10}	$PM_{2.5}$
		lb/VMT	lb/VMT	lb/VMT	lb/VMT	lb/VMT	lb/VMT
	2007	0.011552	0.001213	0.001182	1.08E-05	0.000084	5.2432E-05
	2008	0.010548	0.001103	0.001079	1.07E-05	0.000085	5.2928E-05
	2009	0.009686	0.001005	0.000992	1.07E-05	0.000086	5.384E-05
	2010	0.008263	0.000918	0.000914	1.08E-05	0.000087	5.4781E-05
	2011	0.008263	0.000845	0.000852	1.08E-05	0.000089	5.6525E-05
	2014	0.006604	0.000655	0.000702	1.07E-05	0.000092	5.9387E-05

Delivery Trucks	Year	CO	NOx	ROG	SOx	PM_{10}	$PM_{2.5}$
		lb/VMT	lb/VMT	lb/VMT	lb/VMT	lb/VMT	lb/VMT
	2007	0.024076	0.025084	0.003231	2.63E-05	0.000910	0.00078884
	2008	0.021949	0.023713	0.002993	2.56E-05	0.000856	0.00073933
	2009	0.020161	0.022366	0.002789	2.68E-05	0.000805	0.00069228
	2010	0.018438	0.020625	0.00259	2.7E-05	0.000751	0.00064233
	2011	0.016932	0.018934	0.002419	2.73E-05	0.000701	0.00059682
	2014	0.012843	0.014252	0.001896	2.75E-05	0.000549	0.00045519

Source: SCAQMD CEQA Handbook website: http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html

Appendix I:

Table I2: Heavy Heavy Duty Vehicles Emission Factors

Highest (Most Conservative) EMFAC2007 (version 2.3) Emission Factors for On-Road Heavy-Heavy-Duty Diesel Trucks

Projects in the SCAQMD (Scenario Years 2007 - 2026)

Derived from Peak Emissions Inventory (**Winter**, **Annual**, **Summer**)

Vehicle Class:

Heavy-Heavy-Duty Diesel Trucks (33,001 to 60,000 pounds)

	CO	NOx	ROG	SOx	PM_{10}	$PM_{2.5}$
	lb/VMT	lb/VMT	lb/VMT	lb/VMT	lb/VMT	lb/VMT
2007	0.0145	0.0472	0.0037	0.0000	0.0023	0.0020
2008	0.0136	0.0446	0.0035	0.0000	0.0022	0.0019
2009	0.0128	0.0418	0.0033	0.0000	0.0020	0.0018
2010	0.0120	0.0382	0.0030	0.0000	0.0018	0.0016
2011	0.0111	0.0346	0.0028	0.0000	0.0017	0.0014
2014	0.0085	0.0242	0.0020	0.0000	0.0012	0.0010

Source: SCAQMD CEQA Handbook website: http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html

Appendix I:

Table I3: Off-road Construction Equipment Emission Factors (lb/hour)

Source: SCAQMD CEQA Handbook website:
http://www.aqmd.gov/ceqa/handbook/offroad/offroad.html (January 2007)

		2009				
Eq Name	Hp	CO	NOx	VOC	SOx	PM10
Bore/Drill Rigs	Composite	0.5200	1.2287	0.1162	0.0017	0.0541
Cement and Mortar Mixers	Composite	0.0440	0.0626	0.0107	0.0001	0.0040
Concrete/Industrial Saws	Composite	0.4340	0.6906	0.1363	0.0007	0.0581
Cranes	Composite	0.5705	1.5293	0.1683	0.0014	0.0678
Crawler Tractors	Composite	0.6616	1.4607	0.1961	0.0013	0.0898
Crushing/Proc. Equipment	Composite	0.7440	1.5130	0.2274	0.0015	0.0976
Dumpers/Tenders	Composite	0.0345	0.0662	0.0114	0.0001	0.0039
Excavators	Composite	0.5697	1.2340	0.1584	0.0013	0.0681
Forklifts	Composite	0.2366	0.5560	0.0741	0.0006	0.0302
Generator Sets	Composite	0.3378	0.6718	0.1020	0.0007	0.0414
Graders	Composite	0.6428	1.5237	0.1825	0.0015	0.0796
Off-Highway Tractors	Composite	0.8664	2.0818	0.2470	0.0017	0.1017
Off-Highway Trucks	Composite	0.7931	2.5505	0.2597	0.0027	0.0929
Other Construction Equipment	Composite	0.4291	1.0812	0.1130	0.0013	0.0471
Pavers	Composite	0.5756	1.0321	0.1867	0.0009	0.0739
Paving Equipment	Composite	0.4544	0.9400	0.1405	0.0008	0.0655
Air Compressor	Composite	0.3699	0.7664	0.1180	0.0007	0.0547
Rollers	Composite	0.4272	0.8166	0.1250	0.0008	0.0574
Rough Terrain Forklifts	Composite	0.4815	0.8505	0.1368	0.0008	0.0719
Rubber Tired Dozers	Composite	1.5020	3.1254	0.3508	0.0025	0.1347
Rubber Tired Loaders	Composite	0.5214	1.2255	0.1530	0.0012	0.0688
Scrapers	Composite	1.3278	3.0630	0.3347	0.0027	0.1321
Signal Boards	Composite	0.0959	0.1678	0.0234	0.0002	0.0096
Skid Steer Loaders	Composite	0.2565	0.3057	0.0783	0.0004	0.0276
Surfacing Equipment	Composite	0.6589	1.6559	0.1647	0.0017	0.0639
Tractors/Loaders/Backhoes	Composite	0.3993	0.7227	0.1109	0.0008	0.0559
Trenchers	Composite	0.4992	0.7910	0.1762	0.0007	0.0663
Welders	Composite	0.2281	0.3015	0.0847	0.0003	0.0280
		2010				
Eq Name	Hp	CO	NOx	VOC	SOx	PM10
Bore/Drill Rigs	Composite	0.5146	1.1331	0.1052	0.0017	0.0498
Cement and Mortar Mixers	Composite	0.0434	0.0599	0.0101	0.0001	0.0035
Concrete/Industrial Saws	Composite	0.4273	0.6566	0.1270	0.0007	0.0552
Cranes	Composite	0.5431	1.4515	0.1594	0.0014	0.0642
Crawler Tractors	Composite	0.6409	1.3854	0.1861	0.0013	0.0854
Crushing/Proc. Equipment	Composite	0.7260	1.4394	0.2152	0.0015	0.0935
Dumpers/Tenders	Composite	0.0336	0.0645	0.0108	0.0001	0.0036
Excavators	Composite	0.5581	1.1502	0.1483	0.0013	0.0638
Forklifts	Composite	0.2319	0.5161	0.0686	0.0006	0.0281
Generator Sets	Composite	0.3293	0.6440	0.0961	0.0007	0.0396
Graders	Composite	0.6314	1.4338	0.1723	0.0015	0.0753
Off-Highway Tractors	Composite	0.8385	1.9897	0.2368	0.0017	0.0974
Off-Highway Trucks	Composite	0.7429	2.3885	0.2480	0.0027	0.0875
Other Construction Equipment	Composite	0.4108	1.0117	0.1056	0.0013	0.0442
Pavers	Composite	0.5644	0.9868	0.1774	0.0009	0.0709
Paving Equipment	Composite	0.4478	0.8963	0.1336	0.0008	0.0629
Air Compressor	Composite	0.3613	0.7320	0.1120	0.0007	0.0526
Rollers	Composite	0.4212	0.7749	0.1176	0.0008	0.0547
Rough Terrain Forklifts	Composite	0.4766	0.7988	0.1272	0.0008	0.0678
Rubber Tired Dozers	Composite	1.4128	2.9891	0.3379	0.0025	0.1288
Rubber Tired Loaders	Composite	0.5078	1.1537	0.1440	0.0012	0.0651
Scrapers	Composite	1.2424	2.9078	0.3202	0.0027	0.1256
Signal Boards	Composite	0.0953	0.1615	0.0224	0.0002	0.0091
Skid Steer Loaders	Composite	0.2489	0.2919	0.0692	0.0004	0.0252
Surfacing Equipment	Composite	0.6164	1.5685	0.1550	0.0017	0.0606
Tractors/Loaders/Backhoes	Composite	0.3930	0.6747	0.1021	0.0008	0.0521
Trenchers	Composite	0.4907	0.7598	0.1675	0.0007	0.0637
Welders	Composite	0.2246	0.2920	0.0805	0.0003	0.0270

Appendix I:

Table I3: Off-road Construction Equipment Emission Factors (lb/hour)

Source: SCAQMD CEQA Handbook website:
http://www.aqmd.gov/ceqa/handbook/offroad/offroad.html (January 2007)

		2011				
Eq Name	Hp	CO	NOx	VOC	SOx	PM10
Bore/Drill Rigs	Composite	0.5102	1.0078	0.0943	0.0017	0.0436
Cement and Mortar Mixers	Composite	0.0429	0.0575	0.0096	0.0001	0.0032
Concrete/Industrial Saws	Composite	0.4209	0.6240	0.1179	0.0007	0.0525
Cranes	Composite	0.5179	1.3616	0.1507	0.0014	0.0599
Crawler Tractors	Composite	0.6220	1.3068	0.1764	0.0013	0.0806
Crushing/Proc. Equipment	Composite	0.7073	1.3533	0.2014	0.0015	0.0884
Dumpers/Tenders	Composite	0.0330	0.0629	0.0103	0.0001	0.0034
Excavators	Composite	0.5482	1.0633	0.1388	0.0013	0.0592
Forklifts	Composite	0.2284	0.4742	0.0635	0.0006	0.0257
Generator Sets	Composite	0.3204	0.6121	0.0898	0.0007	0.0376
Graders	Composite	0.6216	1.3404	0.1626	0.0015	0.0707
Off-Highway Tractors	Composite	0.8123	1.8919	0.2267	0.0017	0.0926
Off-Highway Trucks	Composite	0.6994	2.1931	0.2355	0.0027	0.0792
Other Construction Equipment	Composite	0.3954	0.9318	0.0984	0.0013	0.0404
Pavers	Composite	0.5541	0.9421	0.1684	0.0009	0.0679
Paving Equipment	Composite	0.4418	0.8536	0.1269	0.0008	0.0603
Air Compressor	Composite	0.3524	0.6923	0.1054	0.0007	0.0501
Rollers	Composite	0.4157	0.7341	0.1106	0.0008	0.0521
Rough Terrain Forklifts	Composite	0.4721	0.7494	0.1181	0.0008	0.0638
Rubber Tired Dozers	Composite	1.3284	2.8341	0.3244	0.0025	0.1212
Rubber Tired Loaders	Composite	0.4959	1.0770	0.1354	0.0012	0.0608
Scrapers	Composite	1.1660	2.7331	0.3055	0.0027	0.1172
Signal Boards	Composite	0.0946	0.1545	0.0214	0.0002	0.0087
Skid Steer Loaders	Composite	0.2418	0.2800	0.0609	0.0004	0.0230
Surfacing Equipment	Composite	0.5792	1.4649	0.1453	0.0017	0.0558
Tractors/Loaders/Backhoes	Composite	0.3874	0.6275	0.0938	0.0008	0.0482
Trenchers	Composite	0.4826	0.7297	0.1590	0.0007	0.0612
Welders	Composite	0.2203	0.2818	0.0758	0.0003	0.0258
		2014				
Eq Name	Hp	CO	NOx	VOC	SOx	PM10
Bore/Drill Rigs	Composite	0.5030	0.7108	0.0729	0.0017	0.0248
Cement and Mortar Mixers	Composite	0.0420	0.0550	0.0089	0.0001	0.0025
Concrete/Industrial Saws	Composite	0.4031	0.5267	0.0917	0.0007	0.0413
Cranes	Composite	0.4553	1.1060	0.1276	0.0014	0.0466
Crawler Tractors	Composite	0.5767	1.0845	0.1499	0.0013	0.0644
Crushing/Proc. Equipment	Composite	0.6651	1.0860	0.1597	0.0015	0.0677
Dumpers/Tenders	Composite	0.0317	0.0595	0.0095	0.0001	0.0027
Excavators	Composite	0.5289	0.8287	0.1143	0.0013	0.0428
Forklifts	Composite	0.2215	0.3546	0.0497	0.0006	0.0178
Generator Sets	Composite	0.2974	0.5082	0.0702	0.0007	0.0296
Graders	Composite	0.5987	1.0796	0.1362	0.0015	0.0539
Off-Highway Tractors	Composite	0.7438	1.6111	0.1986	0.0017	0.0767
Off-Highway Trucks	Composite	0.6148	1.6604	0.2034	0.0027	0.0579
Other Construction Equipment	Composite	0.3698	0.7149	0.0820	0.0013	0.0296
Pavers	Composite	0.5277	0.8110	0.1429	0.0009	0.0564
Paving Equipment	Composite	0.4273	0.7312	0.1082	0.0008	0.0502
Air Compressor	Composite	0.3313	0.5633	0.0842	0.0007	0.0396
Rollers	Composite	0.4018	0.6163	0.0912	0.0008	0.0419
Rough Terrain Forklifts	Composite	0.4608	0.6101	0.0929	0.0008	0.0477
Rubber Tired Dozers	Composite	1.1059	2.3822	0.2854	0.0025	0.0993
Rubber Tired Loaders	Composite	0.4683	0.8614	0.1122	0.0012	0.0461
Scrapers	Composite	0.9890	2.2328	0.2648	0.0027	0.0928
Signal Boards	Composite	0.0929	0.1332	0.0181	0.0002	0.0071
Skid Steer Loaders	Composite	0.2262	0.2369	0.0406	0.0004	0.0152
Surfacing Equipment	Composite	0.4930	1.1675	0.1194	0.0017	0.0427
Tractors/Loaders/Backhoes	Composite	0.3747	0.4974	0.0728	0.0008	0.0341
Trenchers	Composite	0.4606	0.6384	0.1350	0.0007	0.0517
Welders	Composite	0.2041	0.2436	0.0589	0.0003	0.0206

Appendix I:

Table I4: Fugitive PM_{10} Emission Factors Summary

Fugitive Emission Factors for Construction Activities

Activity	Fugitive PM10 EF	Unit
Demolition (1)	0.00042	lb/ft^3/day
Excavation (1)	0.00042	lb/ft^3/day
Grading (1)	26.4	lb/acre/day
Storage Pile Filling/Truck Dumping (1)	0.016335	lbs/yd^3
Storage Pile empty/Truck Loading (1)	0.03969	lbs/yd^3
Storage Pile Wind Erosion (2)	40	lb/acre/day
Vehicle travel on unpaved road (heavy trucks) (3)	1.86	lb/VMT
Vehicle travel on unpaved road (light trucks) (3)	1.00	lb/VMT
Site Water Spray Control Efficiency (4)	68%	
Unpaved Road Water Spray Control Efficiency (4)	45%	

Note:

1. Source: SCAQMD CEQA Air Quality Handbook, November 1993. Table 9-9, assumed soil density of 1.8 ton/yd3.

2. Source: SCAQMD CEQA Air Quality Handbook, November 1993. Table 9-9-E. Assumed silt content 7.5% for overburden, precipitation days 34.

3. Source: EPA AP-42, 13.2.2, see Appendix E, Table 5 for details

4. Source: SCAQMD CEQA Air Quality Handbook, November 1993, and Fugitive dust control efficiency is assumed to be 68% by watering the site three times a day, 45% by watering the unpaved roads 3 times a day.

5. Fugitive dust emissions from operation of the construction emissions are included in the demolition, site grading, and excavation dust emissions, therefore are not calculated separately.

Appendix I:

Table I5: Fugitive PM_{10} Emission Factors of Unpaved Roads

Vehicle travel on Unpaved Surfaces.

Emission Factor (EPA AP-42 13.2.2):

$EF^{(1)}$ = k [(s/12)^a] [(W/3)^b] [(365-K)/365] lb/vehicle mile traveled (vmt)

	k	s	W	K	Emission factor (lb/VMT)
Heavy duty trucks	1.5	8.5	12	34	1.86
Light duty trucks	1.5	8.5	3	34	1.00

1. Emission factors were calculated using EPA AP-42 13.2.2, equation 1a.

Calculation factors:

Parameters	Description	Assumptions	Note
k:			
s	Silt Loading (%)	8.5	for construction site scraper routes
W	Mean Vehicle Weight (tons)	12	for heavy duty trucks (8-16 tons)
	Mean Vehicle Weight (tons)	3	for light duty trucks and autos (1 - 5 tons)
K	Number of Days > 0.01 in. Precipitation:	34	average for SCAB

Silt content were obtained from EPA AP42 Table 13.2.2-1. The value of scraper routes of construction sites was used.
Weight of trucks were obtained from SCAQMD CEQA Handbook, Table A9-9-D-3.
Average SCAB precipitation conditions were from SCAQMD CEQA Handbook, Table A9-9-D-4.

Appendix I:

Table I6: Emission Factors of Paving

Emissions from Asphalt Paving

Asphalt Off-Gas ROG Emission Factors

	ROG EF	**Unit**	Reference
Emission Rate	2.62	lb ROG / acre	Emission rate from URBEMIS2002 v7.5 model defaults

Appendix I - Tug boat emission factors

Table I7: Emission Factors of Tug Boats

	CO	NOx	ROG	SOx	PM_{10}
x	1.000	1.500	1.500	-	1.500
b	0.000	10.450	0.000	-	0.255
a	0.838	0.126	0.067	-	0.006
FL (slow cruise)	0.400	0.400	0.400	0.400	0.400
FL (Maneuvering)	0.200	0.200	0.200	0.200	0.200
E (slow cruise) (g/KW-hr)	2.095	10.946	0.264	-	0.278
E (Maneuvering) (g/KW-hr)	4.189	11.853	0.746	-	0.321
HP at 100% load	4268.0	4268.0	4268.0	4268.0	4268.0
HP at 40% load	1707.2	1707.2	1707.2	1707.2	1707.2
HP at 20% load	853.6	853.6	853.6	853.6	853.6
Average E (lb/hr)	**5.878**	**23.677**	**0.893**	**0.016**	**0.616**

Emission factor calculation reference: Analysis of Commercial Marine Vessels Emissions and Fuel Consumption Data, EPA Office of Air and Radiation. February 2000.

1. NOx, PM_{10}, CO, and ROG emissions factors were calculated using:
E (g/kW hr) = a (Fractional Load)^-x + b
2. For tugs: average horsepower is assumed to be 4268 Hp, according to the EPA document.
3. It is assumed that the tug boat operation equally split between slow cruise and maneuvering.
4. SOx emissions were calculated based on the fuel consumption and sulfur content in the fuel: .

Fuel Consumption (g/kW-hr) = 14.12/(Fractional Load) + 205.717

Slow Cruise Fuel consumption (g/kW-hr)	241.02
Maneuvering Fuel consumption (g/kW-hr)	276.32
Average Fuel consumption during operation (g/kW-hr)	75.84
Average Fuel consumption (lb/hr)	532.1
Sulfur content (ultra low sulfur fuel)	0.0015%
Sulfur emission factor (lb/hour)	0.00798

The sulfur content limit will be reduced to 500 ppm in 2006, and 15 ppm in 2007 and beyond. The fuel sulfur content limits starting in 2006 are required for California harbor craft in accordance with California Diesel Fuel Regulations (CARB 2004): Title 13, California Code of Regulations, Sections 2281-2285; Title 17, California Code of Regulations, Section 93114. August 14, 2004

Appendix I - $PM_{2.5}$ emission factors

Table I8: $PM_{2.5}$ Fraction of PM_{10} Emissions

PM2.5 Fraction

Category	$PM_{2.5}$ Fraction of PM_{10}
Exhaust, Diesel Off-road Equipment, ships	0.920
Exhaust, On-road Vehicles	0.964
Fugitive Dust - Construction	0.208
Fugitive Dust - unpaved road	0.212

Source:

Appendix A of the Final $PM_{2.5}$ Calculation Methodology and $PM_{2.5}$ Significance Thresholds (SCAQMD, 2006)

Appendix J
Marine Vessel Detour Emission Calculations

Appendix J

Table J1: Marine Vessel Detour Emissions Summary

A. Marine Vessel Detour Emissions Increase Summary During Construction (Daily)

	Detour hours (hours/day)	CO (lb/day)	NOx (lb/day)	ROG (lb/day)	SOx (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Tugs	4.95	29.1	117.0	4.4	0.1	3.1	2.81
Harbor Operations	0.11	0.75	3.01	0.11	0.002	0.079	0.072
Fishing	0.02	0.037	0.15	0.0055	0.0001	0.0038	0.0035
Yachts	1.07	2.7	11.0	0.42	0.007	0.29	0.26
Tankers	0.02	0.43	1.60	0.067	0.001	0.042	0.039
Total Marine Vessel Detour Emissions		**33.1**	**132.8**	**5.0**	**0.09**	**3.5**	3.18
SCAQMD Thresholds		**550**	**100**	**75**	**150**	**150**	**55**

B. Marine Vessel Detour Emissions Increase Summary During Operation (Daily)

	Detour hours (hours/day)	CO (lb/day)	NOx (lb/day)	ROG (lb/day)	SOx (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Tugs	3.53	20.77	83.52	3.16	0.06	2.18	2.00
Harbor Operations	0.08	0.54	2.15	0.08	0.0015	0.06	0.05
Fishing	0.02	0.03	0.10	0.004	0.0001	0.003	0.003
Yachts	0.76	1.95	7.85	0.30	0.0053	0.20	0.19
Tankers	0.02	0.31	1.14	0.05	0.0008	0.03	0.03
Marine Vessel Detour Emissions		**23.59**	**94.78**	**3.59**	**0.06**	**2.47**	**2.27**
SCAQMD Thresholds		**550**	**55**	**55**	**150**	**150**	**55**

C. Marine Vessel Detour Emissions Increase Summary During Construction Year 2009 (Annual)

	Detour hours (hours/yr)	CO ton/year	NOx ton/year	ROG ton/year	SOx ton/year	PM_{10} ton/year	$PM_{2.5}$ ton/year
Tugs	534.6	1.6	6.3	0.2	0.0043	0.165	0.15
Harbor Operations	10.7	0.04	0.15	0.01	0.000101	0.004	0.004
Fishing	2.4	0.002	0.007	0.0003	0.000005	0.0002	0.0002
Yachts	106.3	0.1	0.5	0.02	0.00037	0.014	0.013
Tankers	2.4	0.06	0.21	0.01	0.00014	0.005	0.005
Marine Vessel Detour Emissions 2009		**1.80**	**7.23**	**0.27**	**0.0049**	**0.19**	**0.17**

D. Marine Vessel Detour Emissions Increase Summary During Construction Year 2010 (Annual)

	Detour hours (hours/yr)	CO ton/year	NOx ton/year	ROG ton/year	SOx ton/year	PM_{10} ton/year	$PM_{2.5}$ ton/year
Tugs	1,457.5	4.3	17.2	0.7	0.01163	0.449	0.41
Harbor Operations	30.6	0.11	0.43	0.02	0.00029	0.011	0.010
Fishing	6.8	0.005	0.021	0.0008	0.00001	0.0005	0.0005
Yachts	302.2	0.4	1.6	0.06	0.00105	0.041	0.04
Tankers	6.8	0.06	0.23	0.01	0.00015	0.006	0.005
Marine Vessel Detour Emissions 2010		**4.84**	**19.46**	**0.74**	**0.013**	**0.51**	**0.47**

E. Marine Vessel Detour Emissions Increase Summary During Operation 2011 and after (Annual)

	Detour hours (hours/yr)	CO ton/year	NOx ton/year	ROG ton/year	SOx ton/year	PM_{10} ton/year	$PM_{2.5}$ ton/year
Tugs	1,289.8	3.8	15.2	0.6	0.010	0.4	0.37
Harbor Operations	28.1	0.10	0.39	0.01	0.0003	0.01	0.01
Fishing	6.2	0.005	0.019	0.001	0.000013	0.0005	0.00
Yachts	277.9	0.4	1.4	0.1	0.0010	0.0374	0.03
Tankers	6.2	0.06	0.21	0.01	0.00014	0.01	0.01
Marine Vessel Detour Emissions 2011 and after		**4.31**	**17.30**	**0.65**	**0.012**	**0.45**	**0.41**

F. Marine Vessel Detour Emissions Summary (Annual)

	Year	CO (ton/yr)	NOx (ton/yr)	ROG (ton/yr)	SOx (ton/yr)	PM_{10} (ton/yr)	$PM_{2.5}$ ton/year
Construction 2009	Construction 2009	1.80	7.23	0.27	0.005	0.19	0.17
Construction 2010	Construction 2010	4.84	19.5	0.74	0.013	0.51	0.47
Operation 2011	Operation 2011	4.31	17.30	0.65	0.012	0.45	0.41
Operation 2030	Operation 2030	4.31	17.30	0.65	0.012	0.45	0.41
General Conformity Thresholds		**100**	**25**	**25**	**100**	**70**	100

1. PM2.5 were calculated using the PM2.5/PM10 ratio of 0.92, as in Appendix A of the Final PM2.5 Calculation Methodology and PM2.5 Significance Thresholds (SCAQMD, 2006)

Appendix J

Table J2: Marine Vessel Detour Hours Summary

A. Detour Hours Per Ship Types

		Annual Average Detour Hours			Daily Detour Hours	
Recorded Ship Types	**Ship Type**	**Total Detour Hours 2011 and after (hours/year)**	**Total Detour Hours 2009 (hours/year)**	**Total Detour Hours 2010 (hours/year)**	**During Operation (2011 and after)**	**During Construction (2009 - 2010)**
Tugs	Tugs	809	309	879	2.215	3.10
Tugs w/Barge	Tugs	481	225	578	1.318	1.85
Fishing	Fishing	6	2	7	0.017	0.02
Sail	Yachts	265	101	289	0.727	1.02
Cruise	Yachts	12	5	14	0.034	0.05
Oil Cont.	Harbor Operations	6	2	7	0.017	0.02
Ship	Harbor Operations	3	1	3	0.009	0.01
Power	Harbor Operations	12	5	14	0.034	0.05
CG Cutter	Harbor Operations	3	1	3	0.009	0.01
Tanker	tankers	6	2	7	0.017	0.02
Fire Boat	Harbor Operations	3	1	3.4	0.009	0.01

Note:

1. Marine vessel detour hours data source: Draft Schuyler Heim Bridge Replacement and SR-47 Expressway Project: Long Term Economic Impacts to Marine Vessel Operation in the Cerritos Channel, CH2M HILL, 2005

2. All ships are assumed to be non-ocean going except the tankers.

3. HP ratings were obtained from the Analysis of Commercial Marine Vessel Emissions and Fuel Consumption Data (EPA, Feb. 2000)

B. Annual Detour Hours Summary

Total Summary	**During Construction 2009**	**During Construction 2010**	**Operation 2011 and after**
	hours/yr	hours/yr	hours/yr
Tugs	535	1,457	1,290
Harbor Operations	11	31	28
Fishing	2	7	6
Yachts	106	302	278
Tankers	2	7	6

C. Maximum Daily Detour Hours Summary

Total Summary	**During Construction**	**During operation**
	hours/day	hours/day
Tugs	4.95	3.53
Harbor Operations	0.11	0.08
Fishing	0.02	0.02
Yachts	1.07	0.76
Tankers	0.02	0.02

Appendix J

Table J3: Annual Marine Vessel Detour Emission Calculation - during SHB Construction

A. Emission Factors of PM10, NOx, CO, and ROG

Pollutant	Emission Calculation Factor				non-ocean going ships	
				Activity	slow cruise	maneuvering
				Load factor	0.4	0.2
	x	b	a		(g/kw-hr)	(g/kw-hr)
PM 10	1.5	0.2551	0.0059		0.278	0.321
NOx	1.5	10.4496	0.1225		10.934	11.819
CO	1	0	0.8378		2.095	4.189
HC (ROC)	1.5	0	0.0667	Emission factor	0.264	0.746

Calculation Source: Analysis of Commercial Marine Vessel Emissions and Fuel Consumption Data (EPA, February 2000)

1. Emission factor = $a\,(\text{Load Factor})^{-x} + b$

2. Load factors were the data non-oceangoing ships provided in the Analysis of Commercial Marine Vessel Emissions and Fuel Consumption Data (EPA, Feb. 2000)

B, Emission Factors Calculation for SOx

	slow cruise	maneuvering
Fuel consumption (g/kW-hr)	241.017	276.317
Sulfur content (ultra low sulfur fuel)	0.0015%	0.0015%
SO2 emission factor (g/kw-hour)	0.0072	0.0083

Emission factor calculation reference: Analysis of Commercial Marine Vessels Emissions and Fuel Consumption Data,

1. It is assumed that the ships operation equally split between slow cruise and maneuvering.
2. SOx emissions were calculated based on the fuel consumption and sulfur content in the fuel: .
   Fuel Consumption (g/kW-hr) = 14.12/(Fractional Load) + 205.717
3. The sulfur content limit will be reduced to 500 ppm in 2006, and 15 ppm in 2007 and beyond. The fuel sulfur content limits starting in 2006 are required for California harbor craft in accordance with California Diesel Fuel Regulations (CARB 2004).

C. Emission Calculations

Emissions during construction year: 2009

Pollutant	Fishing		Tug Boats		Yachts		Harbor Operation		Tankers (main engine)		Tankers (auxiliary)		
	slow cruise	maneuvering	slow cruise	maneuvering	slow cruise	maneuvering	slow cruise	maneuvering	slow cruise	maneuvering	slow cruise	maneuvering	
Load Factor	0.4	0.2	0.4	0.2	0.4	0.2	0.4	0.2	0.4	0.2	1.0	1.0	
HP	1106.0	1106.0	4268.0	4268.0	1863.0	1863.0	5046.0	5046.0	7500.0	7500.0	1006.0	1676.0	
Detour Hours	1.2	1.2	267.3	267.3	53.1	53.1	5.4	5.4	3.1	3.1	3.1	3.1	Total
	lb/year	lb/year	lb/year	lb/year	lb/year	lb/year	lb/year	lb/year	lb/year	lb/year	lb/year	lb/year	ton/year
PM 10	0.2	0.1	208.9	120.4	18.1	10.4	5.0	2.9	4.3	2.5	1.4	2.8	**0.2**
NOx	9.5	5.1	8202.7	4433.4	711.6	384.6	194.9	105.3	168.4	91.0	56.5	101.7	**7.2**
CO	1.8	1.8	1571.3	1571.3	136.3	136.3	37.3	37.3	32.2	32.2	10.8	36.0	**1.8**
HC (ROC)	0.2	0.3	197.8	279.7	17.2	24.3	4.7	6.6	4.1	5.7	1.4	6.4	**0.3**
SO2	0.006	0.004	5.424	3.109	0.471	0.270	0.129	0.074	0.111	0.064	0.037	0.071	**0.0**

D. Emissions during construction year: 2010

Pollutant	Fishing		Tug Boats		Yachts		Harbor Operation		Tankers (main engine)		Tankers (auxiliary)		
	slow cruise	maneuvering	slow cruise	maneuvering	slow cruise	maneuvering	slow cruise	maneuvering	slow cruise	maneuvering	slow cruise	maneuvering	
Load Factor	0.4	0.2	0.4	0.2	0.4	0.2	0.4	0.2	0.4	0.2	1.0	1.0	
HP	1106.0	1106.0	4268.0	4268.0	1863.0	1863.0	5046.0	5046.0	7500.0	7500.0	1006.0	1676.0	
Detour Hours	3.4	3.4	728.7	728.7	151.1	151.1	15.3	15.3	3.4	3.4	3.4	3.4	Total
	lb/year	lb/year	lb/year	lb/year	lb/year	lb/year	lb/year	lb/year	lb/year	lb/year	lb/year	lb/year	ton/year
PM 10	0.7	0.4	569.4	328.3	51.5	29.7	14.1	8.1	4.7	2.7	1.6	3.0	**0.5**
NOx	27.0	14.6	22362.5	12086.6	2023.9	1093.9	554.3	299.6	183.1	99.0	61.4	110.6	**19.5**
CO	5.2	5.2	4283.8	4283.8	387.7	387.7	106.2	106.2	35.1	35.1	11.8	39.2	**4.8**
HC (ROC)	0.7	0.9	539.2	762.6	48.8	69.0	13.4	18.9	4.4	6.2	1.5	7.0	**0.7**
SO2	0.018	0.010	14.788	8.477	1.338	0.767	0.367	0.210	0.121	0.069	0.041	0.078	**0.0**

Note:

1. HP ratings and load factors were obtained from the Analysis of Commercial Marine Vessel Emissions and Fuel Consumption Data (EPA, Feb. 2000)
2. Marine vessel detour hours data source: Draft Schuyler Heim Bridge Replacement and SR-47 Expressway Project: Long Term Economic Impacts to Marine Vessel Operation in the Cerritos Channel, CH2M HILL, 2005
3. Tankers main engine HP ratings were assumed to the average of the two chemical tankers "Spring Virgo" and "Cherry Galaxy" which were recorded by Caltrans to pass through the bridge during 2003 to 2005. Tanker's auxiliary engine HP rating were obtained from the Analysis of Commercial Marine Vessel Emissions and Fuel Consumption Data (EPA, Feb. 2000)
4. Tankers were assumed to use the same diesel as required by the California Diesel Fuel Regulations.

Appendix J

Table J4: Daily Marine Vessel Detour Emission Calculation - during SHB Construction

A. Emission Factors of PM10, NOx, CO, and ROG

Emission factor = $a\,(\text{Load Factor})^{-x} + b$

Emission Factor Calculations

Pollutant	Emission Calculation Factor			Activity	non-ocean going ships	
					slow cruise	maneuvering
				Load factor [1]	0.4	0.2
	x	b	a		(g/kw-hr)	(g/kw-hr)
PM 10	1.5	0.2551	0.0059		0.278	0.321
NOx	1.5	10.4496	0.1225		10.934	11.819
CO	1	0	0.8378		2.095	4.189
HC (ROC)	1.5	0	0.0667	Emission factor	0.264	0.746

Calculation Source: Analysis of Commercial Marine Vessel Emissions and Fuel Consumption Data (EPA, February 2000)

1. Emission factor = $a\,(\text{Load Factor})^{-x} + b$

2. Load factors were the data non-oceangoing ships provided in the Analysis of Commercial Marine Vessel Emissions and Fuel Consumption Data (EPA, Feb. 2000)

B. Emission Factors Calculation for SOx

	slow cruise	maneuvering
Fuel consumption (g/kW-hr)	241.017	276.317
Sulfur content (ultra low sulfur fuel)	0.0015%	0.0015%
SO2 emission factor (g/kw-hour)	0.0072	0.0083

Emission factor calculation reference: Analysis of Commercial Marine Vessels Emissions and Fuel Consumption Data,

1. It is assumed that the ships operation equally split between slow cruise and maneuvering.
2. SOx emissions were calculated based on the fuel consumption and sulfur content in the fuel: .
   Fuel Consumption (g/kW-hr) = 14.12/(Fractional Load) + 205.717

3. The sulfur content limit will be reduced to 500 ppm in 2006, and 15 ppm in 2007 and beyond. The fuel sulfur content limits starting in 2006 are required for California harbor craft in accordance with California Diesel Fuel Regulations (CARB 2004).

C. Worst Case Daily Emission Calculations (during full closure of the bridge)

Pollutant	Fishing		Tug Boats		Yachts		Harbor Operation		Tankers (main engine)		Tankers (auxiliary)		
	slow cruise	maneuvering	slow cruise	maneuvering	slow cruise	maneuvering	slow cruise	maneuvering	slow cruise	maneuvering	slow cruise	maneuvering	
Load Factor	0.4	0.2	0.4	0.2	0.4	0.2	0.4	0.2	0.4	0.2	1.0	1.0	
HP	1106.0	1106.0	4268.0	4268.0	1863.0	1863.0	5046.0	5046.0	7500.0	7500.0	1006.0	1676.0	
Detour Hours	0.01	0.01	2.5	2.5	0.5	0.5	0.05	0.05	0.01	0.01	0.01	0.01	Total
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
PM 10	0.002	0.001	1.9	1.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	**3.5**
NOx	0.1	0.1	76.0	41.1	7.1	3.9	2.0	1.1	0.6	0.3	0.2	0.4	**132.8**
CO	0.0	0.0	14.6	14.6	1.4	1.4	0.4	0.4	0.1	0.1	0.0	0.1	**33.1**
HC (ROC)	0.0	0.0	1.8	2.6	0.2	0.2	0.0	0.1	0.02	0.02	0.01	0.02	**5.0**
SO2	0.000	0.000	0.050	0.029	0.005	0.003	0.001	0.00074	0.00043	0.00025	0.00014	0.00027	**0.090**

Note:

1. HP ratings and load factors were obtained from the Analysis of Commercial Marine Vessel Emissions and Fuel Consumption Data (EPA, Feb. 2000)
2. Marine vessel detour hours data source: Draft Schuyler Heim Bridge Replacement and SR-47 Expressway Project: Long Term Economic Impacts to Marine Vessel Operation in the Cerritos Channel, CH2M HILL, 2005
from the Analysis of Commercial Marine Vessel Emissions and Fuel Consumption Data (EPA, Feb. 2000)
4. Tankers were assumed to use the same diesel as required by the California Diesel Fuel Regulations.

Appendix J

Table J5: Marine Vessel Detour Emission Calculation - during Operation

A. Emission Factors of PM10, NOx, CO, and ROG

Emission factor = a (Load Factor)^{x} + b

Emission Factor Calculations

Pollutant	Emission Calculation Factor				non-ocean going ships	
				Activity	slow cruise	maneuvering
				Load factor [1]	0.4	0.2
	x	b	a		(g/kw-hr)	(g/kw-hr)
PM 10	1.5	0.2551	0.0059		0.278	0.321
NOx	1.5	10.4496	0.1225		10.934	11.819
CO	1	0	0.8378		2.095	4.189
HC (ROC)	1.5	0	0.0667	Emission factor	0.264	0.746

[1] Used the load factor of non-oceangoing ships provided in the Analysis of Commercial Marine Vessel Emissions and Fuel Consumption Data (EPA, Feb. 2000)

B. Emission Factors Calculation for SOx

	non-ocean going ships	
	slow cruise	maneuvering
Fuel consumption (g/kW-hr)	241.017	276.317
Sulfur content (ultra low sulfur fuel)	0.0015%	0.0015%
SO2 emission factor (g/kw-hour)	0.0072	0.0083

Emission factor calculation reference: Analysis of Commercial Marine Vessels Emissions and Fuel Consumption Data,

1. It is assumed that the ships operation equally split between slow cruise and maneuvering.
2. SOx emissions were calculated based on the fuel consumption and sulfur content in the fuel: .
   Fuel Consumption (g/kW-hr) = 14.12/(Fractional Load) + 205.717
3. The sulfur content limit will be reduced to 500 ppm in 2006, and 15 ppm in 2007 and beyond. The fuel sulfur content limits starting in 2006 are required for California harbor craft in accordance with California Diesel Fuel Regulations (CARB 2004).

C. Emission Calculations

		Fishing		Tug Boats		Yachts		Harbor Operation		Tankers (main engine)		Tankers (auxiliary)		
		slow cruise	maneuvering	slow cruise	maneuvering	slow cruise	maneuvering	slow cruise	maneuvering	slow cruise	maneuvering	slow cruise	maneuvering	
	Load Factor	0.4	0.2	0.4	0.2	0.4	0.2	0.4	0.2	0.4	0.2	1.0	1.0	
	HP	1106.0	1106.0	4268.0	4268.0	1863.0	1863.0	5046.0	5046.0	7500.0	7500.0	1006.0	1676.0	
	Detour Hours	3.1	3.1	644.9	644.9	138.9	138.9	14.0	14.0	3.1	3.1	3.1	3.1	Total
		lb/year	lb/year	lb/year	lb/year	lb/year	lb/year	lb/year	lb/year	lb/year	lb/year	lb/year	lb/year	ton/year
	PM 10	0.6	0.4	503.9	290.6	47.4	27.3	13.0	7.5	4.3	2.5	1.4	2.8	**0.5**
	NOx	24.8	13.4	19790.1	10696.3	1860.9	1005.8	509.7	275.5	168.4	91.0	56.5	101.7	**17.3**
	CO	4.8	4.8	3791.0	3791.0	356.5	356.5	97.6	97.6	32.2	32.2	10.8	36.0	**4.3**
	HC (ROC)	0.6	0.8	477.2	674.9	44.9	63.5	12.3	17.4	4.1	5.7	1.4	6.4	**0.7**
Annual Emissions	SO2	0.016	0.009	13.087	7.502	1.231	0.705	0.337	0.193	0.111	0.064	0.037	0.071	**0.0**
		lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
	PM 10	0.002	0.001	1.381	0.796	0.130	0.075	0.036	0.021	0.012	0.007	0.004	0.008	**2.5**
	NOx	0.068	0.037	54.219	29.305	5.098	2.756	1.396	0.755	0.461	0.249	0.155	0.279	**94.8**
	CO	0.013	0.013	10.386	10.386	0.977	0.977	0.268	0.268	0.088	0.088	0.030	0.099	**23.6**
	HC (ROC)	0.002	0.002	1.307	1.849	0.123	0.174	0.034	0.048	0.011	0.016	0.004	0.018	**3.6**
Daily Emissions	SO2	0.000	0.000	0.036	0.021	0.003	0.002	0.001	0.001	0.0003	0.0002	0.0001	0.0002	**0.1**

1. HP ratings and load factors were obtained from the Analysis of Commercial Marine Vessel Emissions and Fuel Consumption Data (EPA, Feb. 2000)
2. Marine vessel detour hours data source: Draft Schuyler Heim Bridge Replacement and SR-47 Expressway Project: Long Term Economic Impacts to Marine Vessel Operation in the Cerritos Channel, CH2M HILL, 2005
3. Tankers main engine HP ratings were assumed to the average of the two chemical tankers "Spring Virgo" and "Cherry Galaxy" which were recorded by Caltrans to pass through the bridge during 2003 to 2005. Tanker's auxiliary engine HP rating were obtained
4. Tankers were assumed to use the same diesel as required by the California Diesel Fuel Regulations.

Appendix K
Vehicle Operational Emission Calculations

Appendix K:

Table K1 VMT Data

Peak Hour and Daily VMT Within the Project Area

			2011			2015			2030		
		2003 (baseline)	No Build	Alternative 1	Alternative 2	No Build	Alternative 1	Alternative 2	No Build	Alternative 1	Alternative 2
	auto VMT	300067	315508	316057	318603	330960	331598	334674	374857	376353	379040
	port trucks VMT	28070	35027	34231	34906	42401	41143	42051	64613	62344	63308
	other trucks VMT	4213	6631	6662	6703	6748	6781	6841	7138	7197	7255
AM Peak Hour	Vehicle Speed (miles/hour)	37.6	37.5	38.0	38.4	36.1	37.0	37.4	30.9	31.9	32.5
	auto VMT	393883	373505	374910	378176	396821	398498	401417	457117	457988	461808
	port trucks VMT	27618	28883	28084	28771	35146	34181	34922	49227	47340	48369
	other trucks VMT	9831	7877	7866	7996	7922	7955	8118	8432	8518	8547
PM Peak Hour	Vehicle Speed (miles/hour)	28.1	36.4	36.9	36.9	34.8	35.4	35.7	28.9	29.9	30.2
	auto VMT	3762790	3683868	3696964	3857134	3867096	3881725	3913907	4384500	4407170	4436443
	port trucks VMT	446582	509987	496472	454902	609988	593061	604778	874743	845124	858343
	other trucks VMT	133242	128848	128981	105845	131813	132236	133812	144870	146453	146750
Daily	Vehicle Speed (miles/hour)	41.3	46.9	47.5	47.7	44.8	45.7	46.3	37.4	38.6	39.3

Daily Peak and Off-peak Hour VMT in the Entire Project Study Area

	2003	
	Off-peak hours	Peak hours
Traffic volume	7,798,848	7,485,807
VMT	2,244,726	2,097,887
VMT Truck %	17%	9%
Vehicle speed	46.55	36.80

	2011					
	No Build		**Alternative 1**		**Alternative 2**	
	Off-peak hours	Peak hours	Off-peak hours	Peak hours	Off-peak hours	Peak hours
Traffic volume	7,775,692	7,448,539	7,812,932	7,482,810	8,147,043	7,581,312
VMT	2,214,516	2,108,188	2,213,187	2,109,230	2,288,475	2,129,407
VMT Truck %	19%	10%	19%	10%	15%	10%
Vehicle speed	51.32	43.02	51.97	43.63	51.98	43.84

	2015					
	No Build		**Alternative 1**		**Alternative 2**	
	Off-peak hours	Peak hours	Off-peak hours	Peak hours	Off-peak hours	Peak hours
Traffic volume	8,254,712	7,867,911	8,265,950	7,887,533	8,366,055	7,986,241
VMT	2,356,307	2,252,591	2,353,996	2,253,027	2,377,856	2,274,640
VMT Truck %	21%	11%	21%	11%	21%	11%
Vehicle speed	48.72	41.26	49.83	42.12	50.60	42.52

	2030					
	No Build		**Alternative 1**		**Alternative 2**	
Traffic volume	Off-peak hours	Peak hours	Off-peak hours	Peak hours	Off-peak hours	Peak hours
VMT	9,623,204	9,068,536	9,649,811	9,072,127	9,728,716	9,171,706
VMT Truck %	2,763,126	2,640,987	2,762,269	2,636,478	2,781,469	2,660,067
Vehicle speed	24%	13%	24%	13%	24%	13%
	40.29	34.75	41.53	35.88	42.43	36.42

Data Source: Meyer, Mohaddes Associate (MMA). 2007.

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Table K2: Vehicle Operational Emission Calculations

A. Project Area VMT

Scenario	Daily VMT Cars	Daily VMT Other Trucks	Daily VMT Port Trucks	Average Speed
2003 - Existing	3,762,790	133,242	446,582	41.3
2011- No Build	3,683,868	128,848	509,987	46.9
2011- Alternative 1	3,696,964	128,981	496,472	47.5
2011 - Alternative 2	3,857,134	105,845	454,902	47.7
2015 - No Build	3,867,096	131,813	609,988	44.8
2015 - Alternative 1	3,881,725	132,236	593,061	45.7
2015 - Alternative 2	3,913,907	133,812	604,778	46.3
2030 - No Build	4,384,500	144,870	874,743	37.4
2030 - Alternative 1	4,407,170	146,453	845,124	38.6
2030 - Alternative 2	4,436,443	146,750	858,343	39.3

Note:

1. The VMT by vehicle type and average speeds by alternative were provided by Meyer, Mohaddes.

B. Vehicle Emission Factors

	Vehicle Type	Emission Factors g/mile					
Year 2003		**CO**	**NOx**	**ROG**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
	Regional Cars	5.290	1.129	0.225	0.008	0.052	0.035
Speed 41 mph	Heavy-Duty Trucks	8.353	13.498	0.803	0.110	0.547	0.478
Year 2011							
	Regional Cars	2.316	0.670	0.089	0.004	0.046	0.030
Speed 47 mph	Heavy-Duty Trucks	4.072	9.015	0.493	0.014	0.357	0.302
	Regional Cars	2.307	0.674	0.089	0.004	0.046	0.030
Speed 48 mph	Heavy-Duty Trucks	4.059	9.062	0.491	0.014	0.360	0.305
Year 2015							
	Regional Cars	1.726	0.466	0.062	0.004	0.043	0.028
Speed 45 mph	Heavy-Duty Trucks	2.719	5.590	0.347	0.014	0.255	0.207
	Regional Cars	1.713	0.468	0.062	0.004	0.043	0.028
Speed 46 mph	Heavy-Duty Trucks	2.707	5.605	0.343	0.014	0.257	0.209
Year 2030							
	Regional Cars	0.878	0.178	0.030	0.004	0.040	0.025
Speed 37 mph	Heavy-Duty Trucks	1.186	1.860	0.184	0.015	0.108	0.095
	Regional Cars	0.856	0.176	0.029	0.004	0.040	0.024
Speed 39 mph	Heavy-Duty Trucks	1.168	1.827	0.175	0.015	0.108	0.095

1. Assumed the EMFAC2007 fleet average emission factor represented the Regional Cars.
2. Assumed the EMFAC2007 vehicle class 'HHDT diesel' emission factor represented HDT trucks and port trucks.
3. The PM_{10} and $PM_{2.5}$ emission factors represent the sum of the emissions from exhaust, brake wear, and tire wear.

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Table K2: Vehicle Operational Emission Calculations
C. Vehicle Operational Emissions

		Emissions in gram/day					
Scenario	**VMT Category**	**CO**	**NOx**	**ROG**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
2003 - Existing	Daily VMT Cars	19,905,158	4,248,190	846,628	30,102	195,665	131,698
	Daily VMT Other Trucks	1,112,968	1,798,496	106,993	14,657	72,883	63,690
	Daily VMT Port Trucks	3,730,296	6,027,958	358,605	49,124	244,280	213,466
2011- No Build	Daily VMT Cars	8,531,838	2,468,191	327,864	14,735	169,458	110,516
	Daily VMT Other Trucks	524,670	1,161,567	63,522	1,804	45,999	38,912
	Daily VMT Port Trucks	2,076,668	4,597,534	251,424	7,140	182,065	154,016
2011- Alternative 1	Daily VMT Cars	8,528,895	2,491,754	329,030	14,788	170,060	110,909
	Daily VMT Other Trucks	523,534	1,168,826	63,330	1,806	46,433	39,339
	Daily VMT Port Trucks	2,015,178	4,499,025	243,768	6,951	178,730	151,424
2011 - Alternative 2	Daily VMT Cars	8,898,409	2,599,708	343,285	15,429	177,428	115,714
	Daily VMT Other Trucks	429,627	959,172	51,970	1,482	38,104	32,283
	Daily VMT Port Trucks	1,846,449	4,122,325	223,357	6,369	163,765	138,745
2015- No Build	Daily VMT Cars	6,674,609	1,802,067	239,760	15,468	166,285	108,279
	Daily VMT Other Trucks	358,400	736,836	45,739	1,845	33,612	27,285
	Daily VMT Port Trucks	1,658,558	3,409,833	211,666	8,540	155,547	126,268
2015- Alternative 1	Daily VMT Cars	6,649,395	1,816,647	240,667	15,527	166,914	108,688
	Daily VMT Other Trucks	357,963	741,184	45,357	1,851	33,985	27,637
	Daily VMT Port Trucks	1,605,417	3,324,109	203,420	8,303	152,417	123,950
2015 - Alternative 2	Daily VMT Cars	6,704,522	1,831,708	242,662	15,656	168,298	109,589
	Daily VMT Other Trucks	362,228	750,014	45,897	1,873	34,390	27,967
	Daily VMT Port Trucks	1,637,135	3,389,782	207,439	8,467	155,428	126,399
2030 - No Build	Daily VMT Cars	3,849,591	780,441	131,535	17,538	175,380	109,612
	Daily VMT Other Trucks	171,816	269,458	26,656	2,173	15,646	13,763
	Daily VMT Port Trucks	1,037,445	1,627,022	160,953	13,121	94,472	83,101
2030 - Alternative 1	Daily VMT Cars	3,772,537	775,662	127,808	17,629	176,287	105,772
	Daily VMT Other Trucks	171,057	267,569	25,629	2,197	15,817	13,913
	Daily VMT Port Trucks	987,105	1,544,042	147,897	12,677	91,273	80,287
2030 - Alternative 2	Daily VMT Cars	3,797,595	780,814	128,657	17,746	177,458	106,475
	Daily VMT Other Trucks	171,404	268,111	25,681	2,201	15,849	13,941
	Daily VMT Port Trucks	1,002,545	1,568,193	150,210	12,875	92,701	81,543

Appendix K

Table K2: Vehicle Operational Emission Calculations

C. Vehicle Operational Emissions Continued

		Emissions in pound/day					
Scenario	**VMT Category**	**CO**	**NOx**	**ROG**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
2003 - Existing	Daily VMT Cars	43,883	9,365	1,866	66	431	290
	Daily VMT Other Trucks	2,454	3,965	236	32	161	140
	Daily VMT Port Trucks	8,224	13,289	791	108	539	471
2011- No Build	Daily VMT Cars	18,809	5,441	723	32	374	244
	Daily VMT Other Trucks	1,157	2,561	140	4	101	86
	Daily VMT Port Trucks	4,578	10,136	554	16	401	340
2011- Alternative 1	Daily VMT Cars	18,803	5,493	725	33	375	245
	Daily VMT Other Trucks	1,154	2,577	140	4	102	87
	Daily VMT Port Trucks	4,443	9,918	537	15	394	334
2011 - Alternative 2	Daily VMT Cars	19,617	5,731	757	34	391	255
	Daily VMT Other Trucks	947	2,115	115	3	84	71
	Daily VMT Port Trucks	4,071	9,088	492	14	361	306
2015 - No Build	Daily VMT Cars	14,715	3,973	529	34	367	239
	Daily VMT Other Trucks	790	1,624	101	4	74	60
	Daily VMT Port Trucks	3,656	7,517	467	19	343	278
2015 - Alternative 1	Daily VMT Cars	14,659	4,005	531	34	368	240
	Daily VMT Other Trucks	789	1,634	100	4	75	61
	Daily VMT Port Trucks	3,539	7,328	448	18	336	273
2015 - Alternative 2	Daily VMT Cars	14,781	4,038	535	35	371	242
	Daily VMT Other Trucks	799	1,653	101	4	76	62
	Daily VMT Port Trucks	3,609	7,473	457	19	343	279
2030 - No Build	Daily VMT Cars	8,487	1,721	290	39	387	242
	Daily VMT Other Trucks	379	594	59	5	34	30
	Daily VMT Port Trucks	2,287	3,587	355	29	208	183
2030 - Alternative 1	Daily VMT Cars	8,317	1,710	282	39	389	233
	Daily VMT Other Trucks	377	590	57	5	35	31
	Daily VMT Port Trucks	2,176	3,404	326	28	201	177
2030 - Alternative 2	Daily VMT Cars	8,372	1,721	284	39	391	235
	Daily VMT Other Trucks	378	591	57	5	35	31
	Daily VMT Port Trucks	2,210	3,457	331	28	204	180

Appendix K

Table K2: Vehicle Operational Emission Calculations

D. Summary Vehicle Operational Emissions

Scenario	Emissions (pound/day)					
	CO	NOx	ROG	SO_2	PM_{10}	$PM_{2.5}$
2003 - Existing	54,560	26,620	2,893	207	1,131	901
2011- No Build	24,544	18,138	1,417	52	876	669
2011- Alternative 1	24,399	17,989	1,402	52	871	665
2011 - Alternative 2	24,635	16,934	1,364	51	836	632
2011- Alternative 3	24,399	17,989	1,402	52	871	665
2011 - Alternative 4	24,544	18,138	1,417	52	876	669
2015 - No Build	19,161	13,114	1,096	57	784	577
2015 - Alternative 1	18,988	12,967	1,079	57	779	574
2015 - Alternative 2	19,188	13,165	1,093	57	789	582
2015 - Alternative 3	18,988	12,967	1,079	57	779	574
2015 - Alternative 4	19,161	13,114	1,096	57	784	577
2030 - No Build	11,153	5,902	704	72	629	455
2030 - Alternative 1	10,870	5,704	664	72	625	441
2030 - Alternative 2	10,960	5,770	671	72	631	445
2030 - Alternative 3	10,870	5,704	664	72	625	441
2030 - Alternative 4	11,153	5,902	704	72	629	455

1. It was assumed that Alternative 3 and 4 would have the same emissions as Alternatives 1 and No-Build, respectively. Alternative 3 is the bridge avoidance option, which would have the same traffic conditions as Alternative 1. Alternative 4 is the bridge replacement that would not affect the traffic conditions compared to the No-Build Alternative.

Appendix L-1
Evaluation of Potential Localized CO Impacts

APPENDIX L-1

Evaluation of Potential Localized CO Impacts

This appendix provides the documentation to support the CO impact analysis included in Section 4.4.4 of the Air Quality Impacts Technical Study for the Schuyler Heim Bridge Replacement and SR-47 Expressway Project. Localized CO impacts resulting from the project alternatives were evaluated following the Caltrans guidance document, *Transportation Project-Level Carbon Monoxide Protocol (CO Protocol)*, (UCD, 1997). The purpose of this appendix is to document using the CO protocol to evaluate the requirements applicable to the project.

The CO Protocol includes two decision flow charts: Figure 1, Requirements for New Projects, and Figure 3, Local CO Analysis. The Figure 1 decision chart was designed to evaluate the requirements that apply to specific projects and the Figure 3 was designed to determine project-level CO impacts. The following discussion presents the questions from the flow charts and answers for the proposed Project. The responses to the questions were used to determine the level of CO analysis required for the proposed Project.

Responses to Questions from Figure 1. Requirements for New Projects

3.1.1 Is the project exempt from all emissions analyses?
No. The proposed Project is not included in the list of projects exempt in Table 1 of the CO Protocol.

3.1.2 Is the project exempt from regional emissions analysis?
No. The proposed Project is not included in the list of projects exempt from regional emissions analysis in Table 2 of the CO Protocol.

3.1.3 Is the project locally defined as regionally significant?
Yes. According to 40 CFR 93.101, a regionally significant project is a "transportation project that is on a facility which serves regional transportation needs…and would normally be included in the modeling of a metropolitan area's transportation network…" The proposed Project would meet this definition.

3.1.4 Is the project in a federal attainment area?
No. Although the USEPA redesignated the South Coast Air Basin as attainment for the federal CO standards effective June 11, 2007, the South Coast Air Basin is designated nonattainment for ozone, PM_{10}, and $PM_{2.5}$.

3.1.5 Is there a currently conforming RTP and TIP?
Yes. The Southern California Association of Governments (SCAG) 2004 RTP and 2006 RTIP are the currently conforming plans. The draft 2008 RTP is expected to be approved by SCAG in April 2008 and the 2008 RTIP is expected to be adopted in Summer 2008.

3.1.6 Is the project included in the regional emissions analysis supporting the currently conforming RTP and TIP?
Yes. The Schuyler Heim Bridge/SR-47 project is consistent with the Draft 2008 RTP and the 2006 RTIP (amendment #6-13) that are anticipated to be approved by SCAG in April 2008. The 2008 RTIP will be adopted in Summer 2008.

3.1.7 Has the project design concept and/or scope changed significantly from that in the regional emissions analysis?
No. The project design concept is consistent with the description in the Draft 2008 RTP which is anticipated to9 be approved by SCAG in April 2008.

3.1.8 Examine local impacts. (Proceed to Section 4 of the CO Protocol which includes Figure 3, Local CO Analysis).

Responses to Questions from Figure 3. Local CO Analysis

Level 1: Is the project in a CO nonattainment area?
No. The project site is located in a federal CO attainment area.

Level 1: Was the area redesignated as "attainment" after the 1990 Clean Air Act?
Yes. The CO maintenance plan was approved by the USEPA for the project area on May 11, 2007.

Level 1: Has "continued attainment" been verified with the local air district, if appropriate?
According to the CO Protocol, projects in areas where proposed redesignation is so recent that the annual review of monitoring data has not yet occurred should proceed to Level 7.

Level 7: Does the project worsen air quality?
Yes. The CO protocol lists the following criteria for determining the response to this question. Each criterion below is followed by a brief discussion to support the response to the question of whether the project would worsen air quality. The responses are based on a comparison of the peak hour traffic for the No Build and Build Alternatives.

Criteria 1: The project significantly increases the percentage of vehicles operating in cold start mode. Increasing the number of vehicles operating in cold start mode by as little as 2 percent should be considered potentially significant.

Response: The percentage of vehicles operating during the peak hour in cold start mode for the Build Alternatives would be expected to be the same or lower than No Build Alternatives percentage. The project is intended to improve traffic conditions and would not be expected to increase the number of vehicles operating in cold start mode.

Criteria 2: The project significantly increases traffic volumes. Increases in traffic volumes in excess of 5 percent should be considered potentially significant. Increasing the traffic volume by less than 5 percent may still be potentially significant if there is also a reduction in average speeds.

Response: Table 1 below provides peak hour traffic volumes for the No Build and Build Alternatives for roadway segments with the highest traffic volumes. Table 1 shows that traffic volumes would increase more than five percent for Build Alternative 1 when compared to the No Build for the following segments:

- SR-47 Mainline,

- Henry Ford Ramps and,
- SR-103 Anaheim to Pacific Coast Highway (PCH).

Build Alternative 2 would be expected to increase peak hour traffic volumes along the SR-103 to PCH segment when compared to the No Build Alternative. However, Build Alternative 2 would be expected to decrease traffic volumes along the SR-47 Mainline, Henry Ford Ramps, and Alameda to PCH segments when compared to the No Build.

The peak hour traffic volumes would be expected to be similar for Build Alternatives 1 and 2 when compared to the No Build for the following segments:

- I-710, I-405 to Del Amo,
- I-110, Carson to Del Amo,
- I-110, Del Amo to I-405, and
- I-110, I-405 to SR-91.

Since Alternatives 1 and Alternative 2 may increase peak hour traffic volume by more than five percent along some roadway segments when compared to the No Build, the project may worsen local air quality along those segments.

Criteria 3: The project worsens traffic flow. For uninterrupted roadway segments, a reduction in average speeds (within a range of 3 to 50 mph) should be regarded as worsening traffic flow. For intersection segments, a reduction in average speed or an increase in average delay should be considered as worsening traffic flow.

Response: Table 2 summarizes the PM peak hour LOS for intersections within the project study area. The LOS for the Build Alternatives 1 and 2 in the year 2030 would be the same or better than the No Build Alternative except for the Henry Ford and Anaheim St. and Alameda St/Sepulveda Blvd Connector Ramp intersections. Therefore, in most cases, the Build Alternatives would be expected to improve traffic flow at the intersections when compared to the No Build Alternative.

TABLE 1
Peak Hour Traffic Volumes

Roadway Segment	Alternative 6 (No Build) Year 2015	Alternative 1 Year 2015	Alternative 2 Year 2015	Alternative 6 (No Build) Year 2030	Alternative 1 Year 2030	Alternative 2 Year 2030
SR-47 Mainline, New Dock Ramps to HF Ramps	3,268	6,018	5,273	4,561	5,993	3,632
Henry Ford Ramps	1,441	3,264	1,312	1,844	3,736	797
SR-103 Anaheim to PCH	2,131	2,811	5,141	3,491	3,821	4,028
Alameda PCH to I-405	5,326	6,430	2,467	6,169	6,157	4,214
I-710, PCH to Willow	12,125	14,494	14,266	12,544	12,303	12,303
I-710, Willow to I-405	12,631	15,063	14,828	15,648	13,002	12,946
I-710, I-405 to Del Amo	15,782	18,231	18,222	16,415	16,673	16,704
I-710, Long Beach Boulevard to SR-91	19,190	21,732	21,653	20,479	20,563	20,490
I-110, Carson to Del Amo	16,955	18,122	17,927	17,921	17,901	17,948
I-110, Del Amo to I-405	18,023	19,248	19,120	19,028	18,976	19,050
I-110, I-405 to SR-91	20,659	22,097	21,999	21,744	21,858	21,911

Data provided by Meyer, Mohaddes Associates and includes both automobiles and trucks.

TABLE 2
PM Peak Intersection Conditions

Intersections	Level of Service (LOS)					
	Alternative 6 (No Build), Alternative 4 (Year 2015)	**Alternative 1 (Year 2015)**	**Alternative 2 (Year 2015)**	**Alternative 6 (No Build), Alternative 4 (Year 2030)**	**Alternative 1 (Year 2030)**	**Alternative 2 (Year 2030)**
Henry Ford Ave & Anaheim St	C	E	D	E	F	F
Alameda St & Anaheim St	F	D	D	F	F	F
Alameda St / PCH Connector Ramp n/o PCH	C	C	B	D	E	D
Alameda St / Sepulveda Blvd Connector Ramp	C	C	C	D	E	D
Alameda St/ 223rd St	B	B	B	D	B	D
Ocean Blvd/ WB SR-47	B	B	B	B	B	B
Ocean Blvd/ EB SR-47	D	C	C	E	C	C

Data provided by Meyer, Mohaddes Associates

The Build Alternatives would not be expected to significantly increase the percentage of vehicles operating in cold start and would be expected to improve traffic flow. However, the traffic volumes may increase by more than 5 percent at portion of the affected roadway segments for the Build Alternatives when compared to the No Build Alternative. Therefore, the Build Alternatives may worsen air quality.

Level 7: Is the project suspected of resulting in higher CO concentrations than those existing within the region at the time of attainment demonstration?

To answer this question, Section 7.4.2 of the CO Protocol recommends selecting one of the worst- case locations in the region where attainment has been demonstrated and compare it to the "build" scenario of the project with a similar configuration. Therefore, the intersection of Wilshire Boulevard and Veteran Avenue from the South Coast Air Quality Management District (SCAQMD) 2003 AQMP Appendix V attainment demonstration and the intersection of Henry Ford Avenue and Anaheim Street for the Build Alternatives 1 and 2 were compared to evaluate whether the project would result in higher CO concentrations using the following conditions.

a. The receptors at the intersection of Henry Ford and Anaheim Street would be the same distance or farther from the traveled roadway than the receptors at the intersection of Wilshire Boulevard and Veteran Avenue for which attainment has been demonstrated. The attainment demonstration evaluated the CO concentrations at a distance of 3 meters (10 feet) from the edge of the roadways. Since the CO Protocol does not permit the modeling of receptor locations closer than 3 meters, receptor locations for the Build Alternatives would be the same or farther than the receptors evaluated for the attainment demonstration.

b. The Henry Ford and Anaheim Street intersection traffic geometry is similar to the geometry of the intersection of Wilshire Boulevard and Veteran Avenue. The Henry Ford and Anaheim Street intersection is a 3x3 intersection in comparison to the Wilshire Boulevard and Veteran Avenue intersection which is a 4x4 intersection. c. The meteorology for the Henry Ford and Anaheim Street would be the same as the meteorology used for the Wilshire Boulevard and Veteran Avenue intersection in the attainment demonstration. Both intersections would be evaluated using the worst-case scenario meteorology settings in the CAL3QHC model. d. Table 3 shows that the peak hour traffic lane volumes at Henry Ford and Anaheim Street would be lower than the traffic volumes at the intersection of Wilshire Boulevard and Veteran Avenue used in the attainment demonstration.

e. The percentage of vehicles operating during the peak hour in cold start mode for the Henry Ford and Anaheim Street intersection would be expected to be the same or lower than Wilshire Boulevard and Veteran Avenue intersection.

f. The percentage of heavy-duty gas trucks utilizing the Henry Ford and Anaheim Street intersection would be expected to be the same or less than the Wilshire Boulevard and Veteran Avenue intersection. It is assumed that the traffic distribution at the Wilshire Boulevard and Veteran Avenue intersection would not vary from the EMFAC2002 default distribution but that the Henry Ford and Anaheim Street intersection would likely have a higher percentage of heavy-duty diesel trucks than the EMFAC2002 default. Therefore, there would be a lower percentage of heavy-duty gas trucks at the Henry Ford and

Anaheim Street intersection compared to the Wilshire Boulevard and Veteran Avenue intersection.

g. The average delay and queue length for the Henry Ford and Anaheim Street intersection would be expected to be the same or less than the Wilshire Boulevard and Veteran Avenue intersection used for the attainment demonstration. As shown in Table 2 above, the predicted LOS for the Henry Ford and Anaheim Street intersection would be LOS F for Alternative 1, Alternative 2, and No Build Alternative. The LOS for the Wilshire Boulevard and Veteran Avenue intersections used for the attainment demonstration were not listed; however, based on the traffic volumes and intersection geometry the intersection is likely LOS F.

h. The maximum background CO concentration measured during the period 2004-2006 in the project area was 4.2 ppm for 1-hour and 4.66 ppm for 8- hour, which is lower than the background concentrations used for the attainment demonstration which were predicted to be 10.8 for the 1-hour and 9.9 for the 8-hour for the year 2002 (SCAQMD, 2003).

TABLE 3
Intersection Peak Hour Traffic Volumes

Intersections	Peak Hour Traffic Lane Volumes			
	West Link	East Link	North Link	South Link
Attainment Demonstration: Wilshire Boulevard and Veteran Avenue[a]	4,951	3,317	1,400	933
Alternative 1: Henry Ford and Anaheim Street (Year 2015)[b]	1,601	1,869	1,374	237
Alternative 2: Henry Ford and Anaheim Street (Year 2015)[b]	1,351	1,602	1,243	147
Alternative 6 (No Build) : Henry Ford and Anaheim Street (Year 2015)[b]	1,404	1,640	1,378	184
Alternative 1: Henry Ford and Anaheim Street (Year 2030)[b]	1,601	1,869	1,374	342
Alternative 2: Henry Ford and Anaheim Street (Year 2030)[b]	1,584	1,854	1,537	340
Alternative 6 (No Build) : Henry Ford and Anaheim Street (Year 2030)[b]	1,717	1,897	1,690	667

[a] SCAQMD 2003 AQMP Appendix V (SCAQMD, 2003)
[b] Meyer, Mohaddes, Associates Synchro 6 reports.

The evaluation of the above conditions has shown that the Henry Ford and Anaheim Street intersection would not be expected to result in higher CO concentrations than the Wilshire Boulevard and Veteran Avenue intersection used for the attainment demonstrations. Therefore, the project is satisfactory and no further analysis is needed.

References

South Coast Air Quality Management District (SCAQMD). 2003. Air Quality Management Plan, Appendix V Modeling and Attainment Demonstrations.

Appendix L-2
CO Hot Spot Modeling Summary

Appendix L2
Table L2-1: Emission Factors for CO Modeling

CO Hot Spot Emission Factors

	CO Emission Factors (g/mile or g/hr for idle)
Year 2003	
Idle	5.385
Speed 28 mph	6.386
Year 2011	
Idle	4.809
Speed 36 mph	2.567
Speed 37 mph	2.533
Year 2015	
Idle	4.934
Speed 35 mph	1.933
Speed 36 mph	1.906
Year 2030	
Idle	5.245
Speed 29 mph	0.986
Speed 30 mph	0.97

Emission factors from EMFAC2007 version 2.3 for Los Angeles County (subarea SC)

Per comments received from SCAQMD on November, 8, 2007, the idle emission rate (represented by 0 mph in EMFAC2007) for the vehicle category "all" was used for the CO idle emission factor.

Appendix L2
Table L2-2: CO Hotspot Dispersion Model Results

A. 1-hour CO model results (ppm, without background)

Intersection	Exist 2003	No Build 2011	Alt 1 2011	Alt 2 2011	No build 2(	Alt 1 2015	Alt 2 2015	No Build 2030	Alt 1 2030	Alt 2 2030
1-Henry Ford Ave - Anaheim Street	1.6	0.8	0.7	0.7	--	--	--	0.5	0.5	0.4
2-Alameda Street - Anaheim Street	1.6	0.8	0.7	0.7	--	--	--	0.5	0.5	0.4
3-Alameda Street - no PCH	0.9	0.5	0.5	0.4	--	--	--	0.3	0.4	0.2
4-Alameda Street - no Sepulveda Blvd	1.7	0.9	1.1	1.4	--	--	--	0.7	0.7	0.6
5-eo Alameda Street - Sepulveda Blvd	1.7	0.9	1.1	1.4	--	--	--	0.7	0.7	0.6
6-Alameda Street - so 223rd Street	1	0.5	0.6	0.5	--	--	--	0.4	0.3	0.5
Ocean Blvd WB - SR 47	--	0.4	0.6	0.6	0.5	0.6	0.4	0.4	0.3	0.3
Ocean Blvd EB - SR 47	--	0.4	0.6	0.6	0.5	0.6	0.4	0.4	0.3	0.3

B. 8-hour CO results (ppm, without background)

Intersection	Exist 2003	No Build 2011	Alt 1 2011	Alt 2 2011	No build 2(	Alt 1 2015	Alt 2 2015	No Build 2030	Alt 1 2030	Alt 2 2030
1-Henry Ford Ave - Anaheim Street	1.1	0.6	0.5	0.5	--	--	--	0.4	0.4	0.3
2-Alameda Street - Anaheim Street	1.1	0.6	0.5	0.5	--	--	--	0.4	0.4	0.3
3-Alameda Street - no PCH	0.6	0.4	0.4	0.3	--	--	--	0.2	0.3	0.1
4-Alameda Street - no Sepulveda Blvd	1.2	0.6	0.8	1.0	--	--	--	0.5	0.5	0.4
5-eo Alameda Street - Sepulveda Blvd	1.2	0.6	0.8	1.0	--	--	--	0.5	0.5	0.4
6-Alameda Street - so 223rd Street	0.7	0.4	0.4	0.4	--	--	--	0.3	0.2	0.4
Ocean Blvd WB - SR 47	--	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.2
Ocean Blvd EB - SR 47	--	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.2

C. CO Background Concentrations

Background	ppm	Year	Source
1hour background	5.5	2003	2003 Monitoring data from North Long Beach monitoring station
	5.1	2011	SCAQMD 2010 predicted concentration
	5.1	2015	SCAQMD 2015 predicted concentration
	5.1	2030	SCAQMD 2030 predicted concentration
8-hour background	4.66	2003	2003 Monitoring data from North Long Beach monitoring station
	3.9	2011	SCAQMD 2010 predicted concentration
	3.9	2015	SCAQMD 2015 predicted concentration
	3.9	2030	SCAQMD 2030 predicted concentration

D. Total CO Concentrations with Background

1hour total										
Intersection	**Exist 2003**	**No Build 2011**	**Alt 1 2011**	**Alt 2 2011**	**No build 2(**	**Alt 1 2015**	**Alt 2 2015**	**No Build 2030**	**Alt 1 2030**	**Alt 2 2030**
1-Henry Ford Ave - Anaheim Street	7.1	5.9	5.8	5.8	--	--	--	5.6	5.6	5.5
2-Alameda Street - Anaheim Street	7.1	5.9	5.8	5.8	--	--	--	5.6	5.6	5.5
3-Alameda Street - no PCH	6.4	5.6	5.6	5.5	--	--	--	5.4	5.5	5.3
4-Alameda Street - no Sepulveda Blvd	7.2	6	6.2	6.5	--	--	--	5.8	5.8	5.7
5-eo Alameda Street - Sepulveda Blvd	7.2	6	6.2	6.5	--	--	--	5.8	5.8	5.7
6-Alameda Street - so 223rd Street	6.5	5.6	5.7	5.6	--	--	--	5.5	5.4	5.6
Ocean Blvd WB - SR 47	--	5.5	5.7	5.7	5.6	5.7	5.5	5.5	5.4	5.4
Ocean Blvd EB - SR 47	--	5.5	5.7	5.7	5.6	5.7	5.5	5.5	5.4	5.4
8hour total										
Intersection	**Exist 2003**	**No Build 2011**	**Alt 1 2011**	**Alt 2 2011**	**No build 2(**	**Alt 1 2015**	**Alt 2 2015**	**No Build 2030**	**Alt 1 2030**	**Alt 2 2030**
1-Henry Ford Ave - Anaheim Street	5.8	4.5	4.4	4.4	--	--	--	4.3	4.3	4.2
2-Alameda Street - Anaheim Street	5.8	4.5	4.4	4.4	--	--	--	4.3	4.3	4.2
3-Alameda Street - no PCH	5.3	4.3	4.3	4.2	--	--	--	4.1	4.2	4.0
4-Alameda Street - no Sepulveda Blvd	5.9	4.5	4.7	4.9	--	--	--	4.4	4.4	4.3
5-eo Alameda Street - Sepulveda Blvd	5.9	4.5	4.7	4.9	--	--	--	4.4	4.4	4.3
6-Alameda Street - so 223rd Street	5.4	4.3	4.3	4.3	--	--	--	4.2	4.1	4.3
Ocean Blvd WB - SR 47	--	4.2	4.3	4.3	4.3	4.3	4.2	4.2	4.1	4.1
Ocean Blvd EB - SR 47	--	4.2	4.3	4.3	4.3	4.3	4.2	4.2	4.1	4.1

Appendix L-3
CO Hot Spot Modeling Files

Provided on CD.

Appendix L-4
Traffic Analysis by Meyer, Mohaddes Associates
(Synchro Modeling Files)

Traffic Data
PM Peak Existing Conditions

1: Anaheim St & Henry Ford Ave

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø8
Lane Configurations	1	2	1	1	2	1	1	<2	1	1	3>	0	
Volume (vph)	78	1105	94	70	1169	100	452	460	176	112	101	42	
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	Perm			
Protected Phases		6			2			3			4		8
Permitted Phases	6		6	2		2	3		3	4			
Detector Phases	6	6	6	2	2	2	3	3	3	4	4		
Minimum Initial (s)	20	20	20	20	20	20	5	5	5	5	5		1
Minimum Split (s)	28.5	28.5	28.5	28.5	28.5	28.5	10.5	10.5	10.5	19	19		28
Total Split (s)	50.5	50.5	50.5	50.5	50.5	50.5	15.5	15.5	15.5	24	24	0	39.5
Total Split (%)	56.10%	56.10%	56.10%	56.10%	56.10%	56.10%	17.20%	17.20%	17.20%	26.70%	26.70%	0.00%	44%
Yellow Time (s)	5	5	5	5	5	5	4	4	4	4	4		4
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1		1
Lead/Lag							Lead	Lead	Lead	Lag	Lag		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes		
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	None	None	None	None	None		None
Act Effct Green (s)	43.7	43.7	43.7	43.7	43.7	43.7	17	17	17	17.2	17.2		
Actuated g/C Ratio	0.49	0.49	0.49	0.49	0.49	0.49	0.19	0.19	0.19	0.19	0.19		
v/c Ratio	0.7	0.59	0.12	0.54	0.7	0.13	2.09	2.00dl	0.41	0.89	0.15		

Cycle Length: 90

Traffic Data
PM Peak Existing Conditions

2: Anaheim St & Alameda St

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	2>	0	2	2>	0	1	2	1	1	2	1
Volume (vph)	115	912	13	516	1301	25	51	304	652	20	175	311
Turn Type	Perm			Prot			Perm		Over	Perm		Perm
Protected Phases		2		1	6			4	1		4	
Permitted Phases	2						4			4		4
Detector Phases	2	2		1	6		4	4	1	4	4	4
Minimum Initial (s)	7	7		5	7		15	15	5	15	15	15
Minimum Split (s)	38	38		11	38		37	37	11	37	37	37
Total Split (s)	38	38	0	14	52	0	38	38	14	38	38	38
Total Split (%)	42.20%	42.20%	0.00%	15.60%	57.80%	0.00%	42.20%	42.20%	15.60%	42.20%	42.20%	42.20%
Yellow Time (s)	3.5	3.5		3	3.5		4	4	3	4	4	4
All-Red Time (s)	1.5	1.5		2	1.5		3	3	2	3	3	3
Lead/Lag	Lag	Lag		Lead					Lead			
Lead-Lag Optimize?	Yes	Yes		Yes					Yes			
Recall Mode	Min	Min		C-Max	C-Min		Min	Min	C-Max	Min	Min	Min
Act Effct Green (s)	34	34		20.1	58.1		23.9	23.9	20.1	23.9	23.9	23.9
Actuated g/C Ratio	0.38	0.38		0.22	0.65		0.27	0.27	0.22	0.27	0.27	0.27
v/c Ratio	1.29	0.72		0.69	0.6		0.17	0.33	0.91	0.08	0.19	0.72

Cycle Length: 90

Traffic Data
PM Peak Existing Conditions

3: PCH Connector Ramp & Alameda St

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				1		1		3>	0	1	3	
Volume (vph)				173		320		823	235	343	540	
Turn Type						Perm				Prot		
Protected Phases				4				6		5	2	
Permitted Phases						4						
Detector Phases				4		4		6		5	2	
Minimum Initial (s)				5		5		10		5	10	
Minimum Split (s)				31.2		31.2		26.3		19	15.3	
Total Split (s)				31.2		31.2		26.8	0	32	58.8	
Total Split (%)				34.70%		34.70%		29.80%	0.00%	35.60%	65.30%	
Yellow Time (s)				3.2		3.2		4.3		3	4.3	
All-Red Time (s)				2		2		1		0	1	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Recall Mode				Max		Max		C-Min		Max	C-Min	
Act Effct Green (s)				27.2		27.2		22.8		28	54.8	
Actuated g/C Ratio				0.3		0.3		0.25		0.31	0.61	
v/c Ratio				0.33		0.47		0.84		0.64	0.18	

Cycle Length: 90

Traffic Data
PM Peak Existing Conditions

4: Alameda Connector Ramp & Alameda St

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	0	<1>	0	1	<1>	1	0	<3>	0	1	3>	0
Volume (vph)	1	1	0	173	2	582	0	1009	168	331	651	1
Turn Type	Split			Split		Perm	Perm			Prot		
Protected Phases	3	3		4	4			2		1	6	
Permitted Phases						4	2					
Detector Phases	3	3		4	4	4	2	2		1	6	
Minimum Initial (s)	3	3		6	6	6	23	23		6	23	
Minimum Split (s)	8	8		20	20	20	29	29		11	29	
Total Split (s)	8	8	0	27	27	27	52	52	0	43	95	0
Total Split (%)	6.20%	6.20%	0.00%	20.80%	20.80%	20.80%	40.00%	40.00%	0.00%	33.10%	73.10%	0.00%
Yellow Time (s)	3	3		3	3	3	4	4		3	4	
All-Red Time (s)	2	2		2	2	2	2	2		2	2	
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes		
Recall Mode	None	None		None	None	None	Max	Max		None	Max	
Act Effct Green (s)		4		19.1	19.1	19.1		57.9		29.4	91.3	
Actuated g/C Ratio		0.03		0.16	0.16	0.16		0.48		0.25	0.76	
v/c Ratio		0.03		0.63	0.64	0.61		0.5		0.79	0.17	

Cycle Length: 130

Traffic Data
PM Peak Existing Conditions

5: Sepulveda Blvd & Alameda Connector Ramp

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	2	1	1	1	1	0	<2>	0	1	<1>	1
Volume (vph)	221	619	9	4	634	581	4	34	12	394	25	148
Turn Type	Prot		NA	Prot		Perm	Split			Split		Prot
Protected Phases	1	6		5	2		3	3		4	4	4
Permitted Phases						2						
Detector Phases	1	6		5	2	2	3	3		4	4	4
Minimum Initial (s)	5	23		5	23	23	5	5		5	5	5
Minimum Split (s)	11	30		11	30	30	10	10		29	29	29
Total Split (s)	30	84	0	11	65	65	16	16	0	29	29	29
Total Split (%)	21.40%	60.00%	0.00%	7.90%	46.40%	46.40%	11.40%	11.40%	0.00%	20.70%	20.70%	20.70%
Yellow Time (s)	4	4.5		4	4.5	4.5	3	3		4	4	4
All-Red Time (s)	2	2.5		2	2.5	2.5	2	2		2	2	2
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	Max		None	Max	Max	Max	Max		Max	Max	Max
Act Effct Green (s)	23.6	86.5	0	7	61.1	61.1		12		25	25	25
Actuated g/C Ratio	0.17	0.63	0	0.05	0.44	0.44		0.09		0.18	0.18	0.18
v/c Ratio	0.75	0.29	1.29	0.05	0.79	0.63		0.17		0.7	0.74	0.38

Cycle Length: 140

Traffic Data
PM Peak Existing Conditions

6: 223rd Connector Ramp & Alameda St

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				1		1		3>	0	1	3	
Volume (vph)				142		130		1079	410	243	745	
Turn Type						Perm				Prot		
Protected Phases				3				2		1	6	
Permitted Phases						3						
Detector Phases				3		3		2		1	6	
Minimum Initial (s)				10		10		10		5	10	
Minimum Split (s)				20		20		25		9	20	
Total Split (s)				30		30		50	0	25	75	
Total Split (%)				28.60%		28.60%		47.60%	0.00%	23.80%	71.40%	
Yellow Time (s)				3		3		5		3	5	
All-Red Time (s)				1		1		1		1	1	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Recall Mode				None		None		Min		None	Min	
Act Effct Green (s)				12.7		12.7		44		13.7	59	
Actuated g/C Ratio				0.16		0.16		0.59		0.18	0.79	
v/c Ratio				0.51		0.36		0.53		0.8	0.19	

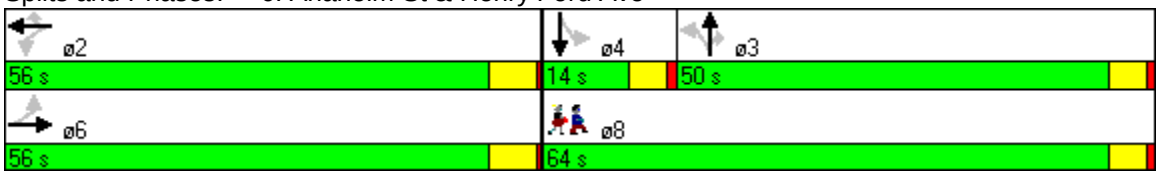
Cycle Length: 105

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1805	5879	1615	1805	3610	1615	1643	3375	1615	1805	4839	0
Flt Permitted	0.077			0.077			0.592	0.697		0.400		
Satd. Flow (perm)	146	5879	1615	146	3610	1615	1024	2410	1615	760	4839	0
Satd. Flow (RTOR)			117			48			33		28	
Volume (vph)	139	1531	199	53	1483	65	829	416	129	107	130	105
Lane Group Flow (vph)	146	1612	209	56	1561	68	437	874	136	113	248	0
Turn Type	Perm		Free	Perm		Perm	Perm		Perm	Perm		
Protected Phases		6			2			3			4	
Permitted Phases	6		Free	2		2	3		3	4		
Detector Phases	6	6		2	2	2	3	3	3	4	4	
Minimum Initial (s)	20.0	20.0		20.0	20.0	20.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	28.5	28.5		28.5	28.5	28.5	10.5	10.5	10.5	10.0	10.0	
Total Split (s)	56.0	56.0	0.0	56.0	56.0	56.0	50.0	50.0	50.0	14.0	14.0	0.0
Total Split (%)	46.7%	46.7%	0.0%	46.7%	46.7%	46.7%	41.7%	41.7%	41.7%	11.7%	11.7%	0.0%
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.5	0.5		0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	
Lead/Lag							Lag	Lag	Lag	Lead	Lead	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Recall Mode	C-Min	C-Min		C-Min	C-Min	C-Min	None	None	None	None	None	
Act Effct Green (s)	52.0	52.0	120.0	52.0	52.0	52.0	46.0	46.0	46.0	10.0	10.0	
Actuated g/C Ratio	0.43	0.43	1.00	0.43	0.43	0.43	0.38	0.38	0.38	0.08	0.08	
v/c Ratio	2.32	0.63	0.13	0.89	1.00	0.09	1.11	1.06dl	0.21	1.79	0.58	
Control Delay	640.1	27.2	0.1	122.6	56.5	8.6	115.0	55.5	19.6	444.9	52.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	640.1	27.2	0.1	122.6	56.5	8.6	115.0	55.5	19.6	444.9	52.7	
LOS	F	C	A	F	E	A	F	E	B	F	D	
Approach Delay		69.8			56.8			70.1			175.5	
Approach LOS		E			E			E			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 66 (55%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.32	
Intersection Signal Delay: 72.9	Intersection LOS: E
Intersection Capacity Utilization 100.7%	ICU Level of Service G
Analysis Period (min) 15	

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 6: Anaheim St & Henry Ford Ave



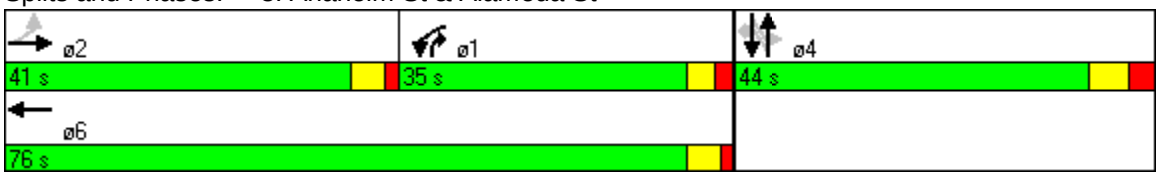
Lane Group	ø8
Lane Configurations	
Total Lost Time (s)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Volume (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	
Minimum Initial (s)	1.0
Minimum Split (s)	28.0
Total Split (s)	64.0
Total Split (%)	53%
Yellow Time (s)	4.0
All-Red Time (s)	1.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1805	3599	0	3502	3596	0	1805	3610	1615	1805	3610	1615
Flt Permitted	0.108			0.950			0.546			0.365		
Satd. Flow (perm)	205	3599	0	3502	3596	0	1037	3610	1615	694	3610	1615
Satd. Flow (RTOR)		1			4				509			43
Volume (vph)	155	968	17	672	1370	34	60	462	774	24	254	360
Lane Group Flow (vph)	163	1037	0	707	1478	0	63	486	815	25	267	379
Turn Type	Perm			Prot			Perm		Over	Perm		Perm
Protected Phases		2		1	6			4	1		4	
Permitted Phases	2						4			4		4
Detector Phases	2	2		1	6		4	4	1	4	4	4
Minimum Initial (s)	7.0	7.0		5.0	7.0		15.0	15.0	5.0	15.0	15.0	15.0
Minimum Split (s)	38.0	38.0		11.0	38.0		37.0	37.0	11.0	37.0	37.0	37.0
Total Split (s)	41.0	41.0	0.0	35.0	76.0	0.0	44.0	44.0	35.0	44.0	44.0	44.0
Total Split (%)	34.2%	34.2%	0.0%	29.2%	63.3%	0.0%	36.7%	36.7%	29.2%	36.7%	36.7%	36.7%
Yellow Time (s)	3.5	3.5		3.0	3.5		4.0	4.0	3.0	4.0	4.0	4.0
All-Red Time (s)	1.5	1.5		2.0	1.5		3.0	3.0	2.0	3.0	3.0	3.0
Lead/Lag	Lead	Lead		Lag					Lag			
Lead-Lag Optimize?	Yes	Yes		Yes					Yes			
Recall Mode	Min	Min		C-Max	C-Min		Min	Min	C-Max	Min	Min	Min
Act Effct Green (s)	46.8	46.8		31.0	81.8		30.2	30.2	31.0	30.2	30.2	30.2
Actuated g/C Ratio	0.39	0.39		0.26	0.68		0.25	0.25	0.26	0.25	0.25	0.25
v/c Ratio	2.04	0.74		0.78	0.60		0.24	0.53	1.03	0.14	0.29	0.86
Control Delay	531.4	36.7		37.3	7.1		35.4	40.1	55.7	33.3	35.8	56.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	531.4	36.7		37.3	7.1		35.4	40.1	55.7	33.3	35.8	56.7
LOS	F	D		D	A		D	D	E	C	D	E
Approach Delay		103.9			16.9			49.2			47.5	
Approach LOS		F			B			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 1:WBL and 6:WBT, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.04	
Intersection Signal Delay: 48.1	Intersection LOS: D
Intersection Capacity Utilization 97.7%	ICU Level of Service F
Analysis Period (min) 15	

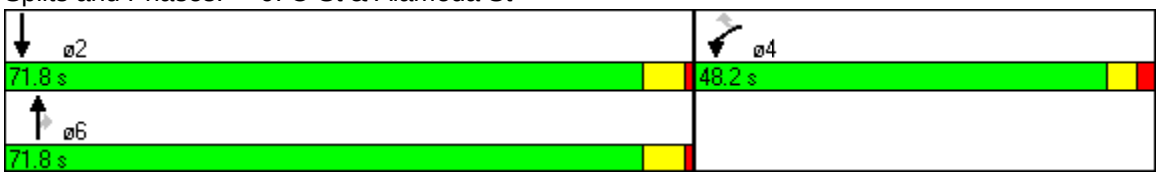
Splits and Phases: 8: Anaheim St & Alameda St



Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations											
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1805	0	1615	0	5187	1615	0	4912	0	0	0
Flt Permitted	0.950										
Satd. Flow (perm)	1805	0	1615	0	5187	1615	0	4912	0	0	0
Satd. Flow (RTOR)			32			519		189			
Volume (vph)	266	0	245	0	1399	493	0	813	446	0	0
Lane Group Flow (vph)	280	0	258	0	1473	519	0	1325	0	0	0
Turn Type	Prot		custom			Perm					
Protected Phases	4				6			2			
Permitted Phases			4			6					
Detector Phases	4		4		6	6		2			
Minimum Initial (s)	5.0		5.0		10.0	10.0		10.0			
Minimum Split (s)	31.2		31.2		26.3	26.3		15.3			
Total Split (s)	48.2	0.0	48.2	0.0	71.8	71.8	0.0	71.8	0.0	0.0	0.0
Total Split (%)	40.2%	0.0%	40.2%	0.0%	59.8%	59.8%	0.0%	59.8%	0.0%	0.0%	0.0%
Yellow Time (s)	3.2		3.2		4.3	4.3		4.3			
All-Red Time (s)	2.0		2.0		1.0	1.0		1.0			
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	Max		Max		C-Min	C-Min		C-Min			
Act Effct Green (s)	49.1		49.1		62.9	62.9		62.9			
Actuated g/C Ratio	0.41		0.41		0.52	0.52		0.52			
v/c Ratio	0.38		0.38		0.54	0.47		0.50			
Control Delay	28.3		25.1		19.5	2.6		13.4			
Queue Delay	0.0		0.0		0.0	0.0		0.0			
Total Delay	28.3		25.1		19.5	2.6		13.4			
LOS	C		C		B	A		B			
Approach Delay					15.1			13.4			
Approach LOS					B			B			

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 114 (95%), Referenced to phase 2:SBT and 6:NBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 16.1	Intersection LOS: B
Intersection Capacity Utilization 48.9%	ICU Level of Service A
Analysis Period (min) 15	

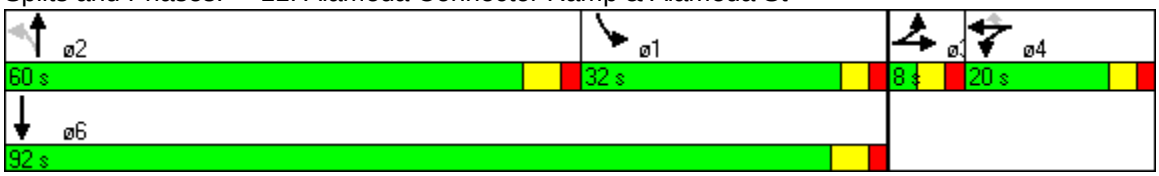
Splits and Phases: 9: O St & Alameda St



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	0	1805	0	1715	1470	1534	0	5151	0	1805	5187	0
Flt Permitted		0.950		0.950						0.950		
Satd. Flow (perm)	0	1805	0	1715	1470	1534	0	5151	0	1805	5187	0
Satd. Flow (RTOR)					357	357		9			1	
Volume (vph)	2	0	0	82	1	678	0	1782	92	425	1106	2
Lane Group Flow (vph)	0	2	0	86	358	357	0	1973	0	447	1166	0
Turn Type	Split			Split		Perm	Perm			Prot		
Protected Phases	3	3		4	4			2		1	6	
Permitted Phases						4	2					
Detector Phases	3	3		4	4	4	2	2		1	6	
Minimum Initial (s)	3.0	3.0		6.0	6.0	6.0	23.0	23.0		6.0	23.0	
Minimum Split (s)	8.0	8.0		20.0	20.0	20.0	29.0	29.0		11.0	29.0	
Total Split (s)	8.0	8.0	0.0	20.0	20.0	20.0	60.0	60.0	0.0	32.0	92.0	0.0
Total Split (%)	6.7%	6.7%	0.0%	16.7%	16.7%	16.7%	50.0%	50.0%	0.0%	26.7%	76.7%	0.0%
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lead	Lead		Lag		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes		
Recall Mode	None	None		None	None	None	C-Max	C-Max		None	C-Max	
Act Effct Green (s)		4.0		15.1	15.1	15.1		63.3		28.0	95.3	
Actuated g/C Ratio		0.03		0.13	0.13	0.13		0.53		0.23	0.79	
v/c Ratio		0.03		0.40	0.72	0.71		0.72		1.06	0.28	
Control Delay		57.5		46.1	15.2	14.6		18.8		101.5	3.5	
Queue Delay		0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay		57.5		46.1	15.2	14.6		18.8		101.5	3.5	
LOS		E		D	B	B		B		F	A	
Approach Delay		57.5			18.3			18.8			30.7	
Approach LOS		E			B			B			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 28 (23%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.06	
Intersection Signal Delay: 23.1	Intersection LOS: C
Intersection Capacity Utilization 78.5%	ICU Level of Service D
Analysis Period (min) 15	

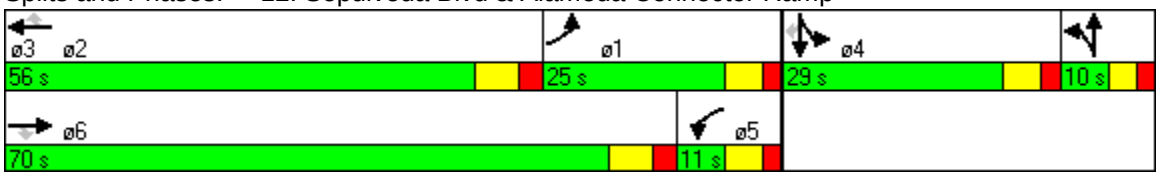
Splits and Phases: 11: Alameda Connector Ramp & Alameda St



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1805	3610	1900	1900	1900	1615	0	3610	0	1715	1715	1615
Flt Permitted	0.950									0.950	0.950	
Satd. Flow (perm)	1805	3610	1900	1900	1900	1615	0	3610	0	1715	1715	1615
Satd. Flow (RTOR)						424						226
Volume (vph)	278	636	0	0	716	522	0	0	0	363	0	215
Lane Group Flow (vph)	293	669	0	0	754	549	0	0	0	191	191	226
Turn Type	Prot		Perm	Prot		Perm	Split			Split		Perm
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases			6			2						4
Detector Phases	1	6	6	5	2	2	3	3		4	4	4
Minimum Initial (s)	5.0	23.0	23.0	5.0	23.0	23.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.0	30.0	30.0	11.0	30.0	30.0	10.0	10.0		29.0	29.0	29.0
Total Split (s)	25.0	70.0	70.0	11.0	56.0	56.0	10.0	10.0	0.0	29.0	29.0	29.0
Total Split (%)	20.8%	58.3%	58.3%	9.2%	46.7%	46.7%	8.3%	8.3%	0.0%	24.2%	24.2%	24.2%
Yellow Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	3.0	3.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.5	2.5	2.0	2.5	2.5	2.0	2.0		2.0	2.0	2.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lag		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	Max	Max		Max	Max	Max
Act Effct Green (s)	21.0	77.0			52.0	52.0				25.0	25.0	25.0
Actuated g/C Ratio	0.18	0.64			0.43	0.43				0.21	0.21	0.21
v/c Ratio	0.93	0.29			0.92	0.58				0.54	0.54	0.44
Control Delay	84.4	9.9			49.4	8.4				15.0	15.0	1.3
Queue Delay	0.0	0.0			0.0	0.0				0.0	0.0	0.0
Total Delay	84.4	9.9			49.4	8.4				15.0	15.0	1.3
LOS	F	A			D	A				B	B	A
Approach Delay		32.6			32.1						9.9	
Approach LOS		C			C						A	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 26 (22%), Referenced to phase 2:WBT and 6:EBT, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 27.6	Intersection LOS: C
Intersection Capacity Utilization 73.1%	ICU Level of Service D
Analysis Period (min) 15	

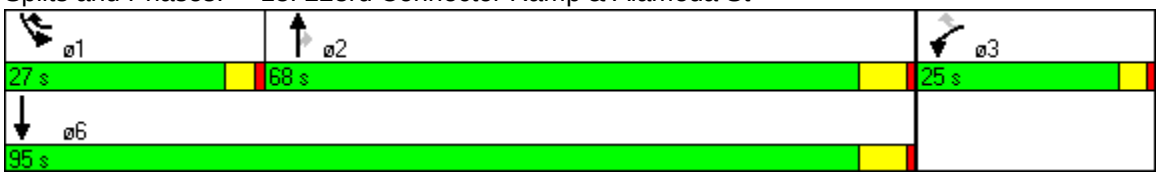
Splits and Phases: 12: Sepulveda Blvd & Alameda Connector Ramp



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1805	1615	5187	1615	3502	3610
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1805	1615	5187	1615	3502	3610
Satd. Flow (RTOR)		13		398		
Volume (vph)	136	145	1647	378	259	1095
Lane Group Flow (vph)	143	153	1734	398	273	1153
Turn Type		pm+ov		Perm	Prot	
Protected Phases	3	1	2		1	6
Permitted Phases		3		2		
Detector Phases	3	1	2	2	1	6
Minimum Initial (s)	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	20.0	9.0	25.0	25.0	9.0	20.0
Total Split (s)	25.0	27.0	68.0	68.0	27.0	95.0
Total Split (%)	20.8%	22.5%	56.7%	56.7%	22.5%	79.2%
Yellow Time (s)	3.0	3.0	5.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag		Lead	Lag	Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	14.7	31.6	80.4	80.4	12.8	97.3
Actuated g/C Ratio	0.12	0.26	0.67	0.67	0.11	0.81
v/c Ratio	0.65	0.35	0.50	0.33	0.73	0.39
Control Delay	63.2	33.6	3.1	0.5	63.2	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.2	33.6	3.1	0.5	63.2	3.9
LOS	E	C	A	A	E	A
Approach Delay	47.9		2.6			15.2
Approach LOS	D		A			B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 14 (12%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 10.8	Intersection LOS: B
Intersection Capacity Utilization 57.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 13: 223rd Connector Ramp & Alameda St

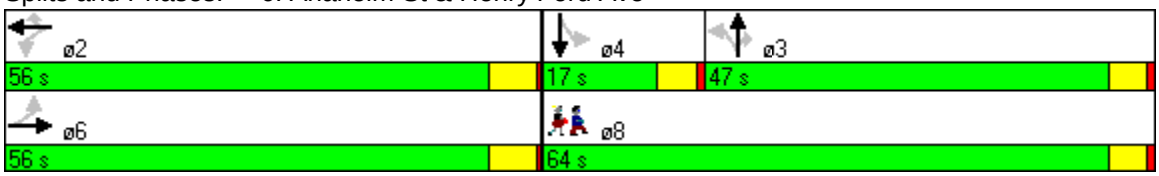


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1805	5879	1615	1805	3610	1615	1643	3385	1615	1805	4824	0
Flt Permitted	0.077			0.133			0.648	0.756		0.308		
Satd. Flow (perm)	146	5879	1615	253	3610	1615	1120	2614	1615	585	4824	0
Satd. Flow (RTOR)			95			67			92		56	
Volume (vph)	126	1188	125	41	1229	74	613	420	111	82	80	69
Lane Group Flow (vph)	133	1251	132	43	1294	78	323	764	117	86	157	0
Turn Type	Perm		Free	Perm		Perm	Perm		Perm	Perm		
Protected Phases		6			2			3			4	
Permitted Phases	6		Free	2		2	3		3	4		
Detector Phases	6	6		2	2	2	3	3	3	4	4	
Minimum Initial (s)	20.0	20.0		20.0	20.0	20.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	28.5	28.5		28.5	28.5	28.5	10.5	10.5	10.5	10.0	10.0	
Total Split (s)	56.0	56.0	0.0	56.0	56.0	56.0	47.0	47.0	47.0	17.0	17.0	0.0
Total Split (%)	46.7%	46.7%	0.0%	46.7%	46.7%	46.7%	39.2%	39.2%	39.2%	14.2%	14.2%	0.0%
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.5	0.5		0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	
Lead/Lag							Lag	Lag	Lag	Lead	Lead	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Recall Mode	C-Min	C-Min		C-Min	C-Min	C-Min	None	None	None	None	None	
Act Effct Green (s)	57.2	57.2	120.0	57.2	57.2	57.2	37.8	37.8	37.8	13.0	13.0	
Actuated g/C Ratio	0.48	0.48	1.00	0.48	0.48	0.48	0.32	0.32	0.32	0.11	0.11	
v/c Ratio	1.93	0.45	0.08	0.36	0.75	0.10	0.92	0.93	0.20	1.37	0.27	
Control Delay	455.9	22.1	0.0	33.3	30.1	6.3	70.0	57.5	9.0	278.8	32.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	455.9	22.1	0.0	33.3	30.1	6.3	70.0	57.5	9.0	278.8	32.8	
LOS	F	C	A	C	C	A	E	E	A	F	C	
Approach Delay		58.2			28.9			56.1			119.8	
Approach LOS		E			C			E			F	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 62 (52%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.93
Intersection Signal Delay: 51.6 Intersection LOS: D
Intersection Capacity Utilization 88.1% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 6: Anaheim St & Henry Ford Ave



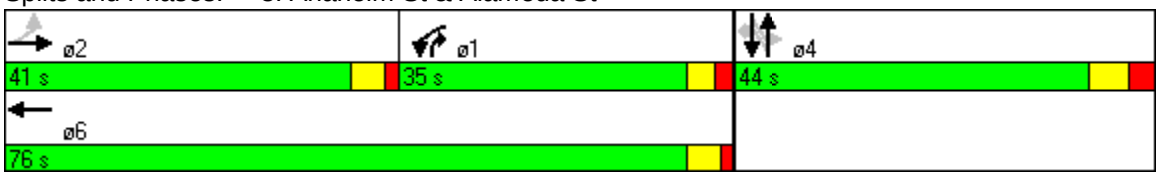
Lane Group	ø8
Lane Configurations	
Total Lost Time (s)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Volume (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	
Minimum Initial (s)	1.0
Minimum Split (s)	28.0
Total Split (s)	64.0
Total Split (%)	53%
Yellow Time (s)	4.0
All-Red Time (s)	1.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1805	3599	0	3502	3596	0	1805	3610	1615	1805	3610	1615
Flt Permitted	0.108			0.950			0.553			0.359		
Satd. Flow (perm)	205	3599	0	3502	3596	0	1051	3610	1615	682	3610	1615
Satd. Flow (RTOR)		1			4				510			42
Volume (vph)	157	975	17	680	1378	35	60	469	780	23	247	347
Lane Group Flow (vph)	165	1044	0	716	1488	0	63	494	821	24	260	365
Turn Type	Perm			Prot			Perm		Over	Perm		Perm
Protected Phases		2		1	6			4	1		4	
Permitted Phases	2						4			4		4
Detector Phases	2	2		1	6		4	4	1	4	4	4
Minimum Initial (s)	7.0	7.0		5.0	7.0		15.0	15.0	5.0	15.0	15.0	15.0
Minimum Split (s)	38.0	38.0		11.0	38.0		37.0	37.0	11.0	37.0	37.0	37.0
Total Split (s)	41.0	41.0	0.0	35.0	76.0	0.0	44.0	44.0	35.0	44.0	44.0	44.0
Total Split (%)	34.2%	34.2%	0.0%	29.2%	63.3%	0.0%	36.7%	36.7%	29.2%	36.7%	36.7%	36.7%
Yellow Time (s)	3.5	3.5		3.0	3.5		4.0	4.0	3.0	4.0	4.0	4.0
All-Red Time (s)	1.5	1.5		2.0	1.5		3.0	3.0	2.0	3.0	3.0	3.0
Lead/Lag	Lead	Lead		Lag					Lag			
Lead-Lag Optimize?	Yes	Yes		Yes					Yes			
Recall Mode	Min	Min		C-Max	C-Min		Min	Min	C-Max	Min	Min	Min
Act Effct Green (s)	47.6	47.6		31.0	82.6		29.4	29.4	31.0	29.4	29.4	29.4
Actuated g/C Ratio	0.40	0.40		0.26	0.69		0.24	0.24	0.26	0.24	0.24	0.24
v/c Ratio	2.04	0.73		0.79	0.60		0.25	0.56	1.03	0.14	0.29	0.85
Control Delay	528.4	35.9		42.2	6.6		36.0	41.2	57.9	33.9	36.3	56.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	528.4	35.9		42.2	6.6		36.0	41.2	57.9	33.9	36.3	56.4
LOS	F	D		D	A		D	D	E	C	D	E
Approach Delay		103.1			18.1			50.9			47.5	
Approach LOS		F			B			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 114 (95%), Referenced to phase 1:WBL and 6:WBT, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.04	
Intersection Signal Delay: 48.8	Intersection LOS: D
Intersection Capacity Utilization 98.3%	ICU Level of Service F
Analysis Period (min) 15	

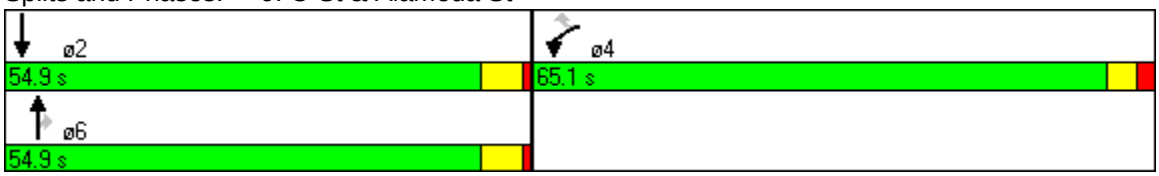
Splits and Phases: 8: Anaheim St & Alameda St



Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations											
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1805	0	1615	0	5187	1615	0	4881	0	0	0
Flt Permitted	0.950										
Satd. Flow (perm)	1805	0	1615	0	5187	1615	0	4881	0	0	0
Satd. Flow (RTOR)			68			267		171			
Volume (vph)	154	0	335	0	840	254	0	537	352	0	0
Lane Group Flow (vph)	162	0	353	0	884	267	0	936	0	0	0
Turn Type	Prot		custom			Perm					
Protected Phases	4				6			2			
Permitted Phases			4			6					
Detector Phases	4		4		6	6		2			
Minimum Initial (s)	5.0		5.0		10.0	10.0		10.0			
Minimum Split (s)	31.2		31.2		26.3	26.3		15.3			
Total Split (s)	65.1	0.0	65.1	0.0	54.9	54.9	0.0	54.9	0.0	0.0	0.0
Total Split (%)	54.3%	0.0%	54.3%	0.0%	45.8%	45.8%	0.0%	45.8%	0.0%	0.0%	0.0%
Yellow Time (s)	3.2		3.2		4.3	4.3		4.3			
All-Red Time (s)	2.0		2.0		1.0	1.0		1.0			
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	Max		Max		C-Min	C-Min		C-Min			
Act Effct Green (s)	76.7		76.7		35.3	35.3		35.3			
Actuated g/C Ratio	0.64		0.64		0.29	0.29		0.29			
v/c Ratio	0.14		0.33		0.58	0.40		0.60			
Control Delay	10.3		10.0		37.0	5.0		30.0			
Queue Delay	0.0		0.0		0.0	0.0		0.0			
Total Delay	10.3		10.0		37.0	5.0		30.0			
LOS	B		A		D	A		C			
Approach Delay					29.6			30.0			
Approach LOS					C			C			

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 31 (26%), Referenced to phase 2:SBT and 6:NBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 25.9	Intersection LOS: C
Intersection Capacity Utilization 43.6%	ICU Level of Service A
Analysis Period (min) 15	

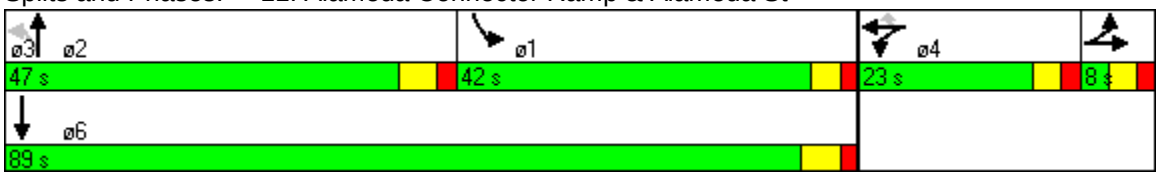
Splits and Phases: 9: O St & Alameda St



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	0	1854	0	1715	1470	1534	0	5146	0	1805	5187	0
Flt Permitted		0.976		0.950						0.950		
Satd. Flow (perm)	0	1854	0	1715	1470	1534	0	5146	0	1805	5187	0
Satd. Flow (RTOR)					355	356		8			1	
Volume (vph)	1	1	0	75	1	675	0	1202	71	429	898	2
Lane Group Flow (vph)	0	2	0	79	356	356	0	1340	0	452	947	0
Turn Type	Split			Split		Perm	Perm			Prot		
Protected Phases	3	3		4	4			2		1	6	
Permitted Phases						4	2					
Detector Phases	3	3		4	4	4	2	2		1	6	
Minimum Initial (s)	3.0	3.0		6.0	6.0	6.0	23.0	23.0		6.0	23.0	
Minimum Split (s)	8.0	8.0		20.0	20.0	20.0	29.0	29.0		11.0	29.0	
Total Split (s)	8.0	8.0	0.0	23.0	23.0	23.0	47.0	47.0	0.0	42.0	89.0	0.0
Total Split (%)	6.7%	6.7%	0.0%	19.2%	19.2%	19.2%	39.2%	39.2%	0.0%	35.0%	74.2%	0.0%
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lead	Lead		Lag		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes		
Recall Mode	None	None		None	None	None	C-Max	C-Max		None	C-Max	
Act Effct Green (s)		4.1		16.0	16.0	16.0		52.4		38.0	94.4	
Actuated g/C Ratio		0.03		0.13	0.13	0.13		0.44		0.32	0.79	
v/c Ratio		0.03		0.34	0.71	0.69		0.60		0.79	0.23	
Control Delay		57.0		40.6	12.8	12.3		15.6		40.6	3.0	
Queue Delay		0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay		57.0		40.6	12.8	12.3		15.6		40.6	3.0	
LOS		E		D	B	B		B		D	A	
Approach Delay		57.0			15.4			15.6			15.1	
Approach LOS		E			B			B			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 29 (24%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 15.4	Intersection LOS: B
Intersection Capacity Utilization 68.2%	ICU Level of Service C
Analysis Period (min) 15	

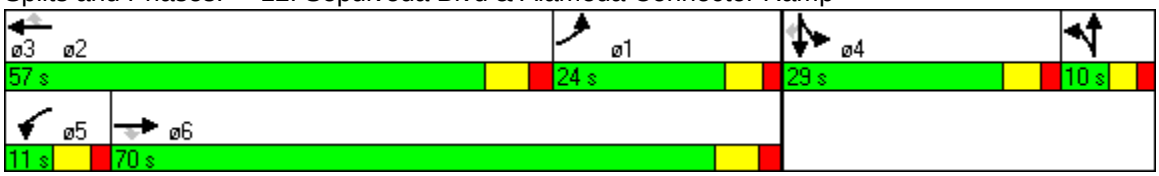
Splits and Phases: 11: Alameda Connector Ramp & Alameda St



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1805	3610	1900	1900	1900	1615	0	3610	0	1715	1715	1615
Flt Permitted	0.950									0.950	0.950	
Satd. Flow (perm)	1805	3610	1900	1900	1900	1615	0	3610	0	1715	1715	1615
Satd. Flow (RTOR)						429						219
Volume (vph)	276	642	0	0	722	524	0	0	0	357	0	208
Lane Group Flow (vph)	291	676	0	0	760	552	0	0	0	188	188	219
Turn Type	Prot		Perm	Prot		Perm	Split			Split		Perm
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases			6			2						4
Detector Phases	1	6	6	5	2	2	3	3		4	4	4
Minimum Initial (s)	5.0	23.0	23.0	5.0	23.0	23.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.0	30.0	30.0	11.0	30.0	30.0	10.0	10.0		29.0	29.0	29.0
Total Split (s)	24.0	70.0	70.0	11.0	57.0	57.0	10.0	10.0	0.0	29.0	29.0	29.0
Total Split (%)	20.0%	58.3%	58.3%	9.2%	47.5%	47.5%	8.3%	8.3%	0.0%	24.2%	24.2%	24.2%
Yellow Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	3.0	3.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.5	2.5	2.0	2.5	2.5	2.0	2.0		2.0	2.0	2.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	Max	Max		Max	Max	Max
Act Effct Green (s)	20.0	77.0			53.0	53.0				25.0	25.0	25.0
Actuated g/C Ratio	0.17	0.64			0.44	0.44				0.21	0.21	0.21
v/c Ratio	0.97	0.29			0.91	0.58				0.53	0.53	0.43
Control Delay	94.2	9.9			47.2	8.0				21.4	21.4	5.5
Queue Delay	0.0	0.0			0.0	0.0				0.0	0.0	0.0
Total Delay	94.2	9.9			47.2	8.0				21.4	21.4	5.5
LOS	F	A			D	A				C	C	A
Approach Delay		35.3			30.7						15.5	
Approach LOS		D			C						B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 38 (32%), Referenced to phase 2:WBT and 6:EBT, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 29.1	Intersection LOS: C
Intersection Capacity Utilization 73.2%	ICU Level of Service D
Analysis Period (min) 15	

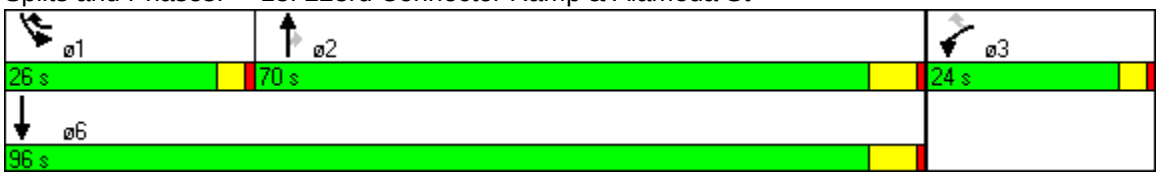
Splits and Phases: 12: Sepulveda Blvd & Alameda Connector Ramp



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	3502	1615	5187	1615	1805	5187
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3502	1615	5187	1615	1805	5187
Satd. Flow (RTOR)		8		594		
Volume (vph)	309	140	1861	564	160	1206
Lane Group Flow (vph)	325	147	1959	594	168	1269
Turn Type		pm+ov		Perm	Prot	
Protected Phases	3	1	2		1	6
Permitted Phases		3		2		
Detector Phases	3	1	2	2	1	6
Minimum Initial (s)	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	20.0	9.0	25.0	25.0	9.0	20.0
Total Split (s)	24.0	26.0	70.0	70.0	26.0	96.0
Total Split (%)	20.0%	21.7%	58.3%	58.3%	21.7%	80.0%
Yellow Time (s)	3.0	3.0	5.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag		Lead	Lag	Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	16.0	34.8	77.2	77.2	14.7	96.0
Actuated g/C Ratio	0.13	0.29	0.64	0.64	0.12	0.80
v/c Ratio	0.69	0.31	0.59	0.47	0.76	0.31
Control Delay	57.5	31.5	5.9	1.2	71.4	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.5	31.5	5.9	1.2	71.4	3.6
LOS	E	C	A	A	E	A
Approach Delay	49.4		4.8			11.5
Approach LOS	D		A			B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 12 (10%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 11.7	Intersection LOS: B
Intersection Capacity Utilization 63.6%	ICU Level of Service B
Analysis Period (min) 15	

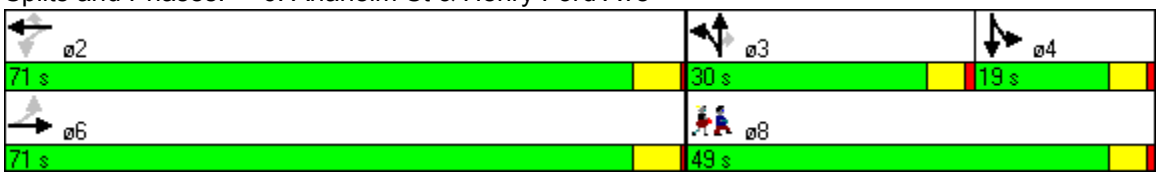
Splits and Phases: 13: 223rd Connector Ramp & Alameda St



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	ø8
Lane Configurations												
Volume (vph)	117	1189	125	42	1210	70	653	432	123	82	80	
Turn Type	Perm		Free	Perm		Perm	Split		Perm	Split		
Protected Phases		6			2		3	3		4	4	8
Permitted Phases	6		Free	2		2			3			
Detector Phases	6	6		2	2	2	3	3	3	4	4	
Minimum Initial (s)	20.0	20.0		20.0	20.0	20.0	5.0	5.0	5.0	5.0	5.0	1.0
Minimum Split (s)	28.5	28.5		28.5	28.5	28.5	10.5	10.5	10.5	19.0	19.0	28.0
Total Split (s)	71.0	71.0	0.0	71.0	71.0	71.0	30.0	30.0	30.0	19.0	19.0	49.0
Total Split (%)	59.2%	59.2%	0.0%	59.2%	59.2%	59.2%	25.0%	25.0%	25.0%	15.8%	15.8%	41%
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5		0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag							Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Recall Mode	C-Min	C-Min		C-Min	C-Min	C-Min	None	None	None	None	None	None
Act Effct Green (s)	69.7	69.7	120.0	69.7	69.7	69.7	28.6	28.6	28.6	9.7	9.7	
Actuated g/C Ratio	0.58	0.58	1.00	0.58	0.58	0.58	0.24	0.24	0.24	0.08	0.08	
v/c Ratio	0.87	0.37	0.08	0.24	0.61	0.08	0.94	0.96	0.27	0.59	0.36	
Control Delay	27.4	8.3	0.0	16.3	17.8	2.7	78.7	68.9	9.0	69.1	39.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	27.4	8.3	0.0	16.3	17.8	2.7	78.7	68.9	9.0	69.1	39.6	
LOS	C	A	A	B	B	A	E	E	A	E	D	
Approach Delay		9.2			17.0			65.6			50.2	
Approach LOS		A			B			E			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 8 (7%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 30.1	Intersection LOS: C
Intersection Capacity Utilization 88.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 6: Anaheim St & Henry Ford Ave

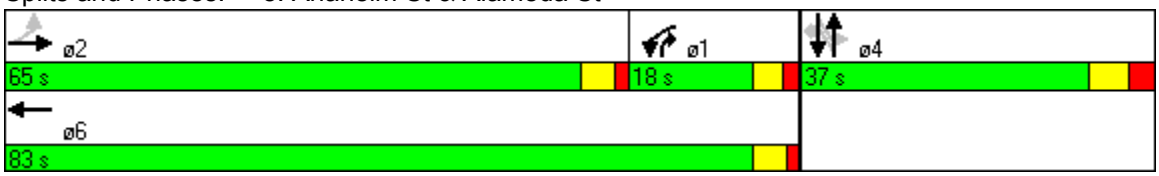


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Volume (vph)	139	955	692	1387	61	440	809	26	267	371
Turn Type	Perm		Prot		Perm		Over	Perm		Perm
Protected Phases		2	1	6		4	1		4	
Permitted Phases	2				4			4		4
Detector Phases	2	2	1	6	4	4	1	4	4	4
Minimum Initial (s)	7.0	7.0	5.0	7.0	15.0	15.0	5.0	15.0	15.0	15.0
Minimum Split (s)	38.0	38.0	11.0	38.0	37.0	37.0	11.0	37.0	37.0	37.0
Total Split (s)	65.0	65.0	18.0	83.0	37.0	37.0	18.0	37.0	37.0	37.0
Total Split (%)	54.2%	54.2%	15.0%	69.2%	30.8%	30.8%	15.0%	30.8%	30.8%	30.8%
Yellow Time (s)	3.5	3.5	3.0	3.5	4.0	4.0	3.0	4.0	4.0	4.0
All-Red Time (s)	1.5	1.5	2.0	1.5	3.0	3.0	2.0	3.0	3.0	3.0
Lead/Lag	Lead	Lead	Lag				Lag			
Lead-Lag Optimize?	Yes	Yes	Yes				Yes			
Recall Mode	Min	Min	C-Max	C-Min	Min	Min	C-Max	Min	Min	Min
Act Effct Green (s)	64.7	64.7	14.0	82.7	29.3	29.3	14.0	29.3	29.3	29.3
Actuated g/C Ratio	0.54	0.54	0.12	0.69	0.24	0.24	0.12	0.24	0.24	0.24
v/c Ratio	1.51	0.53	1.78	0.60	0.27	0.52	1.64	0.17	0.32	0.89
Control Delay	297.3	19.6	388.0	8.9	38.3	41.0	318.5	36.7	37.4	60.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	297.3	19.6	388.0	8.9	38.3	41.0	318.5	36.7	37.4	60.7
LOS	F	B	F	A	D	D	F	D	D	E
Approach Delay		54.3		133.1		212.4			50.4	
Approach LOS		D		F		F			D	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 40 (33%), Referenced to phase 1:WBL and 6:WBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.78
Intersection Signal Delay: 125.7 — Intersection LOS: F
Intersection Capacity Utilization 99.5% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 8: Anaheim St & Alameda St



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	135	441	1037	185	382	664
Turn Type		Perm		Perm	Prot	
Protected Phases	4		6		5	2
Permitted Phases		4		6		
Detector Phases	4	4	6	6	5	2
Minimum Initial (s)	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	31.2	31.2	26.3	26.3	19.0	15.3
Total Split (s)	33.0	33.0	37.0	37.0	50.0	87.0
Total Split (%)	27.5%	27.5%	30.8%	30.8%	41.7%	72.5%
Yellow Time (s)	3.2	3.2	4.3	4.3	3.0	4.3
All-Red Time (s)	2.0	2.0	1.0	1.0	0.0	1.0
Lead/Lag			Lead	Lead	Lag	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	Max	Max	C-Min	C-Min	Max	C-Min
Act Effct Green (s)	29.0	29.0	33.0	33.0	46.0	83.0
Actuated g/C Ratio	0.24	0.24	0.28	0.28	0.38	0.69
v/c Ratio	0.33	0.63	0.77	0.33	0.58	0.19
Control Delay	49.1	22.6	44.3	6.3	37.3	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.1	22.6	44.3	6.3	37.3	8.7
LOS	D	C	D	A	D	A
Approach Delay	28.8		38.5			19.1
Approach LOS	C		D			B

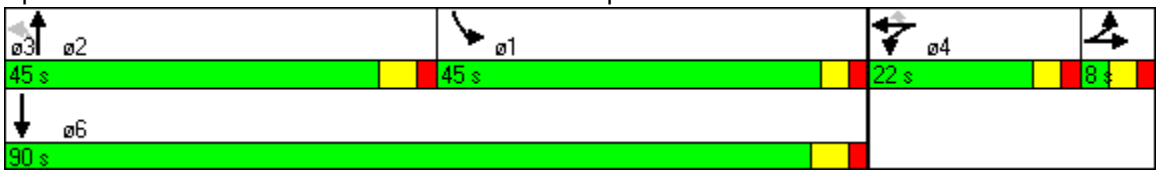
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 46 (38%), Referenced to phase 2:SBT and 6:NBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 29.4	Intersection LOS: C
Intersection Capacity Utilization 58.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 9: PCH Connector Ramp & Alameda St

Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Configurations							
Volume (vph)	1	91	1	677	1461	400	1002
Turn Type		Split		Perm		Prot	
Protected Phases	3	4	4		2	1	6
Permitted Phases				4			
Detector Phases	3	4	4	4	2	1	6
Minimum Initial (s)	3.0	6.0	6.0	6.0	23.0	6.0	23.0
Minimum Split (s)	8.0	20.0	20.0	20.0	29.0	11.0	29.0
Total Split (s)	8.0	22.0	22.0	22.0	45.0	45.0	90.0
Total Split (%)	6.7%	18.3%	18.3%	18.3%	37.5%	37.5%	75.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag	Lag	Lead	Lead	Lead	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	4.0	14.8	14.8	14.8	50.6	41.0	95.6
Actuated g/C Ratio	0.03	0.12	0.12	0.12	0.42	0.34	0.80
v/c Ratio	0.03	0.45	0.72	0.71	0.60	0.68	0.26
Control Delay	57.5	47.9	15.9	15.3	9.0	35.9	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.5	47.9	15.9	15.3	9.0	35.9	3.2
LOS	E	D	B	B	A	D	A
Approach Delay	57.5		19.4		9.0		12.5
Approach LOS	E		B		A		B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 56 (47%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 12.5	Intersection LOS: B
Intersection Capacity Utilization 65.1%	ICU Level of Service C
Analysis Period (min) 15	

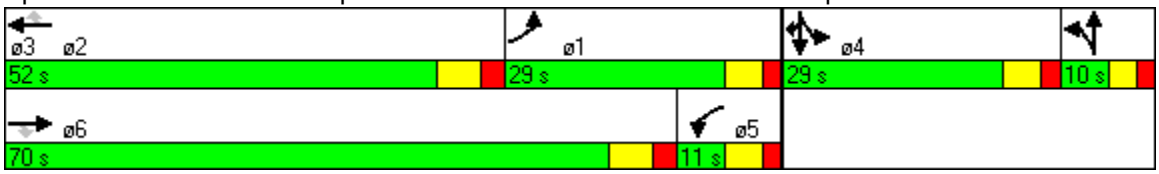
Splits and Phases: 11: Alameda Connector Ramp & Alameda St



Lane Group	EBL	EBT	WBT	WBR	SBL	SBT	SBR	ø3	ø5
Lane Configurations									
Volume (vph)	258	639	664	543	360	0	175		
Turn Type	Prot			Perm	Split		Prot		
Protected Phases	1	6	2		4	4	4	3	5
Permitted Phases				2					
Detector Phases	1	6	2	2	4	4	4		
Minimum Initial (s)	5.0	23.0	23.0	23.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	30.0	30.0	30.0	29.0	29.0	29.0	10.0	11.0
Total Split (s)	29.0	70.0	52.0	52.0	29.0	29.0	29.0	10.0	11.0
Total Split (%)	24.2%	58.3%	43.3%	43.3%	24.2%	24.2%	24.2%	8%	9%
Yellow Time (s)	4.0	4.5	4.5	4.5	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.5	2.5	2.5	2.0	2.0	2.0	2.0	2.0
Lead/Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max	Max	None
Act Effct Green (s)	23.2	75.2	48.0	48.0	26.8	26.8	26.8		
Actuated g/C Ratio	0.19	0.63	0.40	0.40	0.22	0.22	0.22		
v/c Ratio	0.78	0.30	0.92	0.62	0.50	0.49	0.37		
Control Delay	61.7	10.5	53.0	9.3	21.6	21.5	4.7		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	61.7	10.5	53.0	9.3	21.6	21.5	4.7		
LOS	E	B	D	A	C	C	A		
Approach Delay		25.2	33.4			16.0			
Approach LOS		C	C			B			

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 52 (43%), Referenced to phase 2:WBT and 6:EBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 27.1	Intersection LOS: C
Intersection Capacity Utilization 69.2%	ICU Level of Service C
Analysis Period (min) 15	

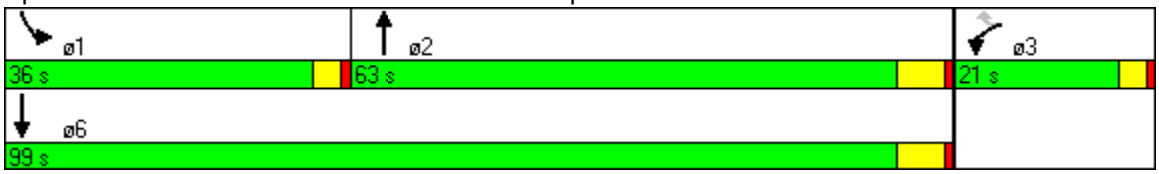
Splits and Phases: 12: Sepulveda Blvd & Alameda Connector Ramp



Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Volume (vph)	154	178	1485	277	1021
Turn Type		Perm		Prot	
Protected Phases	3		2	1	6
Permitted Phases		3			
Detector Phases	3	3	2	1	6
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	20.0	20.0	25.0	9.0	20.0
Total Split (s)	21.0	21.0	63.0	36.0	99.0
Total Split (%)	17.5%	17.5%	52.5%	30.0%	82.5%
Yellow Time (s)	3.0	3.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	C-Min	None	C-Min
Act Effct Green (s)	14.7	14.7	70.8	22.5	97.3
Actuated g/C Ratio	0.12	0.12	0.59	0.19	0.81
v/c Ratio	0.73	0.52	0.65	0.86	0.26
Control Delay	73.0	17.4	4.7	70.5	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	73.0	17.4	4.7	70.5	3.0
LOS	E	B	A	E	A
Approach Delay	43.2		4.7		17.4
Approach LOS	D		A		B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 36 (30%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 13.1	Intersection LOS: B
Intersection Capacity Utilization 70.6%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 13: 223rd Connector Ramp & Alameda St

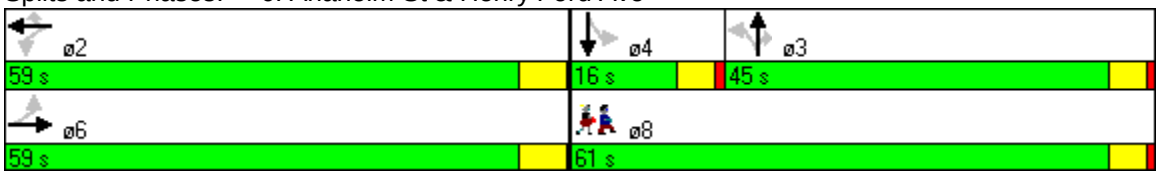


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1805	5879	1615	1805	3610	1615	1643	3375	1615	1805	4839	0
Flt Permitted	0.073			0.073			0.592	0.699		0.333		
Satd. Flow (perm)	139	5879	1615	139	3610	1615	1024	2417	1615	633	4839	0
Satd. Flow (RTOR)			117			50			50		21	
Volume (vph)	139	1531	199	53	1483	65	829	416	129	107	130	105
Lane Group Flow (vph)	146	1612	209	56	1561	68	437	874	136	113	248	0
Turn Type	Perm		Free	Perm		Perm	Perm		Perm	Perm		
Protected Phases		6			2			3			4	
Permitted Phases	6		Free	2		2	3		3	4		
Detector Phases	6	6		2	2	2	3	3	3	4	4	
Minimum Initial (s)	20.0	20.0		20.0	20.0	20.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	28.5	28.5		28.5	28.5	28.5	10.5	10.5	10.5	10.0	10.0	
Total Split (s)	59.0	59.0	0.0	59.0	59.0	59.0	45.0	45.0	45.0	16.0	16.0	0.0
Total Split (%)	49.2%	49.2%	0.0%	49.2%	49.2%	49.2%	37.5%	37.5%	37.5%	13.3%	13.3%	0.0%
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.5	0.5		0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	
Lead/Lag							Lag	Lag	Lag	Lead	Lead	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Recall Mode	C-Min	C-Min		C-Min	C-Min	C-Min	None	None	None	None	None	
Act Effct Green (s)	55.0	55.0	120.0	55.0	55.0	55.0	41.0	41.0	41.0	12.0	12.0	
Actuated g/C Ratio	0.46	0.46	1.00	0.46	0.46	0.46	0.34	0.34	0.34	0.10	0.10	
v/c Ratio	2.28	0.60	0.13	0.88	0.94	0.09	1.25	1.19dl	0.23	1.79	0.49	
Control Delay	603.3	32.6	0.0	117.3	43.7	7.5	168.5	86.4	18.8	433.3	50.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	603.3	32.6	0.0	117.3	43.7	7.5	168.5	86.4	18.8	433.3	50.1	
LOS	F	C	A	F	D	A	F	F	B	F	D	
Approach Delay		71.5			44.7			104.9			170.1	
Approach LOS		E			D			F			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 66 (55%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.28	
Intersection Signal Delay: 78.6	Intersection LOS: E
Intersection Capacity Utilization 100.7%	ICU Level of Service G
Analysis Period (min) 15	

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 6: Anaheim St & Henry Ford Ave



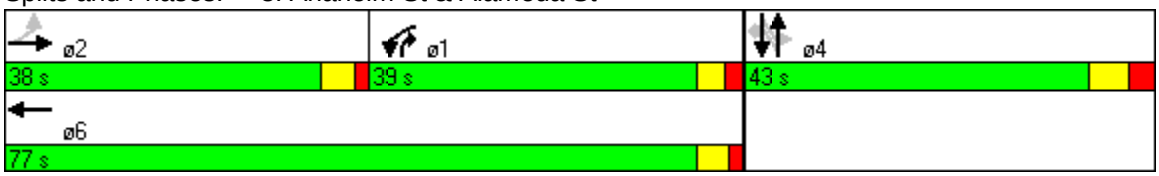
Lane Group	ø8
Lane Configurations	
Total Lost Time (s)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Volume (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	
Minimum Initial (s)	1.0
Minimum Split (s)	28.0
Total Split (s)	61.0
Total Split (%)	51%
Yellow Time (s)	4.0
All-Red Time (s)	1.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1805	3596	0	3502	3592	0	1805	3610	1615	1805	3610	1615
Flt Permitted	0.118			0.950			0.349			0.220		
Satd. Flow (perm)	224	3596	0	3502	3592	0	663	3610	1615	418	3610	1615
Satd. Flow (RTOR)		2			5				495			32
Volume (vph)	248	1264	30	1044	1507	48	67	663	906	34	477	478
Lane Group Flow (vph)	261	1363	0	1099	1637	0	71	698	954	36	502	503
Turn Type	Perm			Prot			Perm		Over	Perm		Perm
Protected Phases		2		1	6			4	1		4	
Permitted Phases	2						4			4		4
Detector Phases	2	2		1	6		4	4	1	4	4	4
Minimum Initial (s)	7.0	7.0		5.0	7.0		15.0	15.0	5.0	15.0	15.0	15.0
Minimum Split (s)	38.0	38.0		11.0	38.0		37.0	37.0	11.0	37.0	37.0	37.0
Total Split (s)	38.0	38.0	0.0	39.0	77.0	0.0	43.0	43.0	39.0	43.0	43.0	43.0
Total Split (%)	31.7%	31.7%	0.0%	32.5%	64.2%	0.0%	35.8%	35.8%	32.5%	35.8%	35.8%	35.8%
Yellow Time (s)	3.5	3.5		3.0	3.5		4.0	4.0	3.0	4.0	4.0	4.0
All-Red Time (s)	1.5	1.5		2.0	1.5		3.0	3.0	2.0	3.0	3.0	3.0
Lead/Lag	Lead	Lead		Lag					Lag			
Lead-Lag Optimize?	Yes	Yes		Yes					Yes			
Recall Mode	Min	Min		C-Max	C-Min		Min	Min	C-Max	Min	Min	Min
Act Effct Green (s)	35.1	35.1		35.0	74.1		37.9	37.9	35.0	37.9	37.9	37.9
Actuated g/C Ratio	0.29	0.29		0.29	0.62		0.32	0.32	0.29	0.32	0.32	0.32
v/c Ratio	4.02	1.29		1.08	0.74		0.34	0.61	1.16	0.27	0.44	0.95
Control Delay	1401.1	175.4		79.4	12.6		36.4	37.3	105.4	38.2	35.4	66.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1401.1	175.4		79.4	12.6		36.4	37.3	105.4	38.2	35.4	66.7
LOS	F	F		E	B		D	D	F	D	D	E
Approach Delay		372.4			39.4			75.0			50.6	
Approach LOS		F			D			E			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 1:WBL and 6:WBT, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 4.02	
Intersection Signal Delay: 125.6	Intersection LOS: F
Intersection Capacity Utilization 114.5%	ICU Level of Service H
Analysis Period (min) 15	

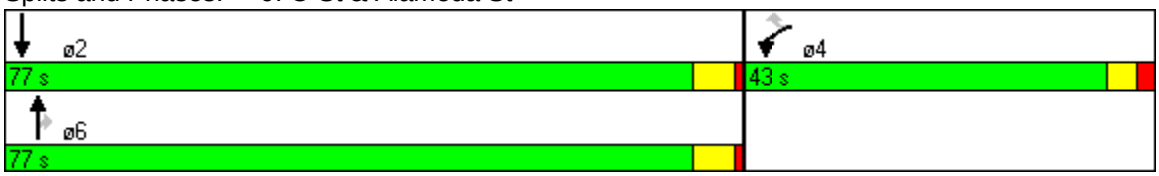
Splits and Phases: 8: Anaheim St & Alameda St



Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations											
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1805	0	1615	0	5187	1615	0	5187	0	0	0
Flt Permitted	0.950										
Satd. Flow (perm)	1805	0	1615	0	5187	1615	0	5187	0	0	0
Satd. Flow (RTOR)			5			1091					
Volume (vph)	560	0	284	0	2247	1324	0	1228	0	0	0
Lane Group Flow (vph)	589	0	299	0	2365	1394	0	1293	0	0	0
Turn Type	Prot		custom			Perm					
Protected Phases	4				6			2			
Permitted Phases			4			6					
Detector Phases	4		4		6	6		2			
Minimum Initial (s)	5.0		5.0		10.0	10.0		10.0			
Minimum Split (s)	31.2		31.2		26.3	26.3		15.3			
Total Split (s)	43.0	0.0	43.0	0.0	77.0	77.0	0.0	77.0	0.0	0.0	0.0
Total Split (%)	35.8%	0.0%	35.8%	0.0%	64.2%	64.2%	0.0%	64.2%	0.0%	0.0%	0.0%
Yellow Time (s)	3.2		3.2		4.3	4.3		4.3			
All-Red Time (s)	2.0		2.0		1.0	1.0		1.0			
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	Max		Max		C-Min	C-Min		C-Min			
Act Effct Green (s)	39.0		39.0		73.0	73.0		73.0			
Actuated g/C Ratio	0.32		0.32		0.61	0.61		0.61			
v/c Ratio	1.00		0.57		0.75	0.99		0.41			
Control Delay	78.9		37.9		18.3	27.5		10.2			
Queue Delay	0.0		0.0		0.0	0.0		0.0			
Total Delay	78.9		37.9		18.3	27.5		10.2			
LOS	E		D		B	C		B			
Approach Delay					21.7			10.2			
Approach LOS					C			B			

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 114 (95%), Referenced to phase 2:SBT and 6:NBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay: 25.7	Intersection LOS: C
Intersection Capacity Utilization 85.3%	ICU Level of Service E
Analysis Period (min) 15	

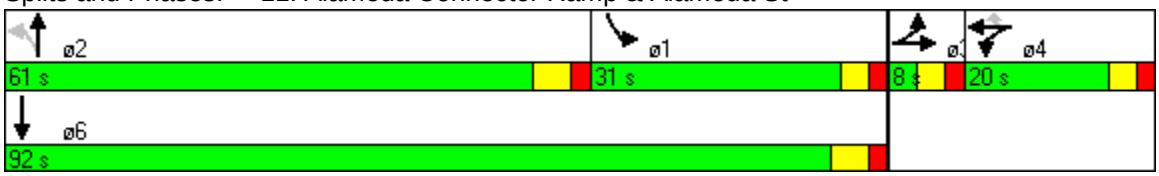
Splits and Phases: 9: O St & Alameda St



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	0	1805	0	1715	1470	1534	0	5161	0	1805	5187	0
Flt Permitted		0.950		0.950						0.950		
Satd. Flow (perm)	0	1805	0	1715	1470	1534	0	5161	0	1805	5187	0
Satd. Flow (RTOR)					365	365		6				
Volume (vph)	2	0	0	90	1	773	0	2787	103	499	1749	2
Lane Group Flow (vph)	0	2	0	95	408	407	0	3042	0	525	1843	0
Turn Type	Split			Split		Perm	Perm			Prot		
Protected Phases	3	3		4	4			2		1	6	
Permitted Phases						4	2					
Detector Phases	3	3		4	4	4	2	2		1	6	
Minimum Initial (s)	3.0	3.0		6.0	6.0	6.0	23.0	23.0		6.0	23.0	
Minimum Split (s)	8.0	8.0		20.0	20.0	20.0	29.0	29.0		11.0	29.0	
Total Split (s)	8.0	8.0	0.0	20.0	20.0	20.0	61.0	61.0	0.0	31.0	92.0	0.0
Total Split (%)	6.7%	6.7%	0.0%	16.7%	16.7%	16.7%	50.8%	50.8%	0.0%	25.8%	76.7%	0.0%
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lead	Lead		Lag		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes		
Recall Mode	None	None		None	None	None	C-Max	C-Max		None	C-Max	
Act Effct Green (s)		4.0		19.4	19.4	19.4		60.0		27.0	91.0	
Actuated g/C Ratio		0.03		0.16	0.16	0.16		0.50		0.22	0.76	
v/c Ratio		0.03		0.34	0.75	0.73		1.18		1.29	0.47	
Control Delay		57.5		39.6	16.8	16.3		106.8		183.6	6.3	
Queue Delay		0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay		57.5		39.6	16.8	16.3		106.8		183.6	6.3	
LOS		E		D	B	B		F		F	A	
Approach Delay		57.5			18.9			106.8			45.6	
Approach LOS		E			B			F			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 28 (23%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.29	
Intersection Signal Delay: 71.2	Intersection LOS: E
Intersection Capacity Utilization 109.5%	ICU Level of Service H
Analysis Period (min) 15	

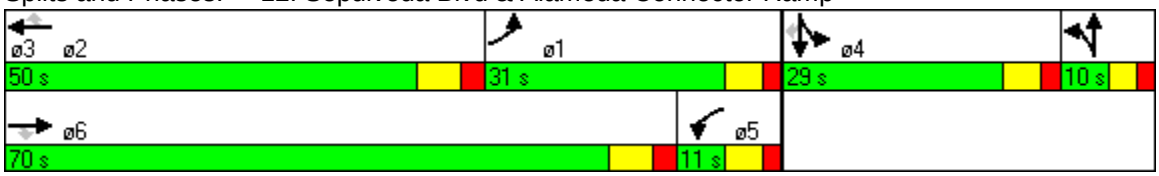
Splits and Phases: 11: Alameda Connector Ramp & Alameda St



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1805	3610	1900	1900	1900	1615	0	3610	0	1715	1715	1615
Flt Permitted	0.950									0.950	0.950	
Satd. Flow (perm)	1805	3610	1900	1900	1900	1615	0	3610	0	1715	1715	1615
Satd. Flow (RTOR)						279						389
Volume (vph)	463	701	0	0	817	427	0	0	0	298	0	370
Lane Group Flow (vph)	487	738	0	0	860	449	0	0	0	157	157	389
Turn Type	Prot		Perm	Prot		Perm	Split			Split		Perm
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases			6			2						4
Detector Phases	1	6	6	5	2	2	3	3		4	4	4
Minimum Initial (s)	5.0	23.0	23.0	5.0	23.0	23.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.0	30.0	30.0	11.0	30.0	30.0	10.0	10.0		29.0	29.0	29.0
Total Split (s)	31.0	70.0	70.0	11.0	50.0	50.0	10.0	10.0	0.0	29.0	29.0	29.0
Total Split (%)	25.8%	58.3%	58.3%	9.2%	41.7%	41.7%	8.3%	8.3%	0.0%	24.2%	24.2%	24.2%
Yellow Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	3.0	3.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.5	2.5	2.0	2.5	2.5	2.0	2.0		2.0	2.0	2.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lag		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	Max	Max		Max	Max	Max
Act Effct Green (s)	27.0	77.0			46.0	46.0				25.0	25.0	25.0
Actuated g/C Ratio	0.22	0.64			0.38	0.38				0.21	0.21	0.21
v/c Ratio	1.20	0.32			1.18	0.57				0.44	0.44	0.60
Control Delay	152.0	10.1			129.7	13.4				10.6	10.6	1.6
Queue Delay	0.0	0.0			0.0	0.0				0.0	0.0	0.0
Total Delay	152.0	10.1			129.7	13.4				10.6	10.6	1.6
LOS	F	B			F	B				B	B	A
Approach Delay		66.5			89.8						5.6	
Approach LOS		E			F						A	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 26 (22%), Referenced to phase 2:WBT and 6:EBT, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.20	
Intersection Signal Delay: 62.7	Intersection LOS: E
Intersection Capacity Utilization 86.9%	ICU Level of Service E
Analysis Period (min) 15	

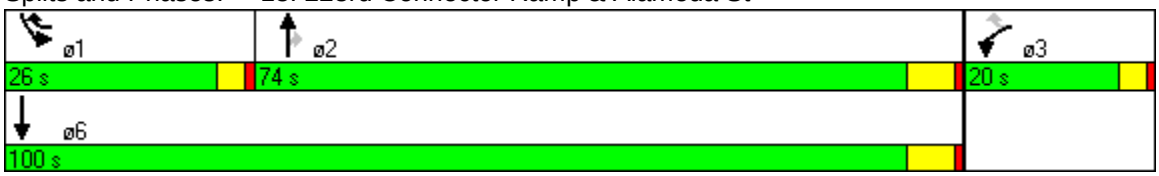
Splits and Phases: 12: Sepulveda Blvd & Alameda Connector Ramp



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1805	1615	5187	1615	3502	3610
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1805	1615	5187	1615	3502	3610
Satd. Flow (RTOR)		2		465		
Volume (vph)	190	368	2492	442	544	1638
Lane Group Flow (vph)	200	387	2623	465	573	1724
Turn Type		pm+ov		Perm	Prot	
Protected Phases	3	1	2		1	6
Permitted Phases		3		2		
Detector Phases	3	1	2	2	1	6
Minimum Initial (s)	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	20.0	9.0	25.0	25.0	9.0	20.0
Total Split (s)	20.0	26.0	74.0	74.0	26.0	100.0
Total Split (%)	16.7%	21.7%	61.7%	61.7%	21.7%	83.3%
Yellow Time (s)	3.0	3.0	5.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag		Lead	Lag	Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	15.4	40.7	71.3	71.3	21.3	96.6
Actuated g/C Ratio	0.13	0.34	0.59	0.59	0.18	0.80
v/c Ratio	0.86	0.70	0.85	0.41	0.92	0.59
Control Delay	83.5	42.0	6.6	0.2	70.1	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.5	42.0	6.6	0.2	70.1	5.4
LOS	F	D	A	A	E	A
Approach Delay	56.1		5.6			21.6
Approach LOS	E		A			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 14 (12%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 16.7	Intersection LOS: B
Intersection Capacity Utilization 84.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 13: 223rd Connector Ramp & Alameda St

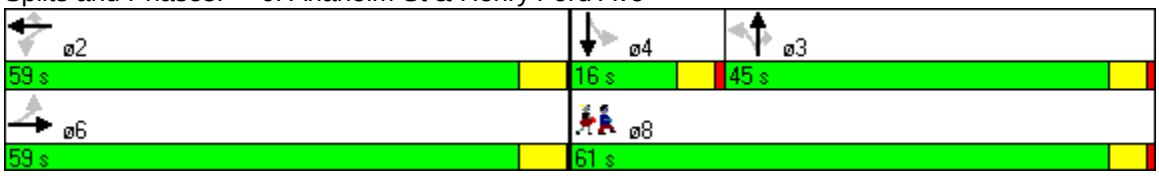


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1805	5879	1615	1805	3610	1615	1643	3378	1615	1805	4860	0
Flt Permitted	0.073			0.077			0.591	0.705		0.333		
Satd. Flow (perm)	139	5879	1615	146	3610	1615	1022	2438	1615	633	4860	0
Satd. Flow (RTOR)			128			57			53		17	
Volume (vph)	148	1494	212	58	1455	71	897	499	141	103	137	100
Lane Group Flow (vph)	156	1573	223	61	1532	75	472	997	148	108	249	0
Turn Type	Perm		Free	Perm		Perm	Perm		Perm	Perm		
Protected Phases		6			2			3			4	
Permitted Phases	6		Free	2		2	3		3	4		
Detector Phases	6	6		2	2	2	3	3	3	4	4	
Minimum Initial (s)	20.0	20.0		20.0	20.0	20.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	28.5	28.5		28.5	28.5	28.5	10.5	10.5	10.5	10.0	10.0	
Total Split (s)	59.0	59.0	0.0	59.0	59.0	59.0	45.0	45.0	45.0	16.0	16.0	0.0
Total Split (%)	49.2%	49.2%	0.0%	49.2%	49.2%	49.2%	37.5%	37.5%	37.5%	13.3%	13.3%	0.0%
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.5	0.5		0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	
Lead/Lag							Lag	Lag	Lag	Lead	Lead	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Recall Mode	C-Min	C-Min		C-Min	C-Min	C-Min	None	None	None	None	None	
Act Effct Green (s)	55.0	55.0	120.0	55.0	55.0	55.0	41.0	41.0	41.0	12.0	12.0	
Actuated g/C Ratio	0.46	0.46	1.00	0.46	0.46	0.46	0.34	0.34	0.34	0.10	0.10	
v/c Ratio	2.44	0.58	0.14	0.91	0.93	0.10	1.35	1.29dl	0.25	1.71	0.50	
Control Delay	671.5	29.7	0.0	123.2	41.4	7.1	209.6	136.0	19.2	417.4	77.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	671.5	29.7	0.0	123.2	41.4	7.1	209.6	136.0	19.2	417.4	77.5	
LOS	F	C	A	F	D	A	F	F	B	F	E	
Approach Delay		77.6			42.9			146.8			180.3	
Approach LOS		E			D			F			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 62 (52%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.44	
Intersection Signal Delay: 93.8	Intersection LOS: F
Intersection Capacity Utilization 102.5%	ICU Level of Service G
Analysis Period (min) 15	

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 6: Anaheim St & Henry Ford Ave



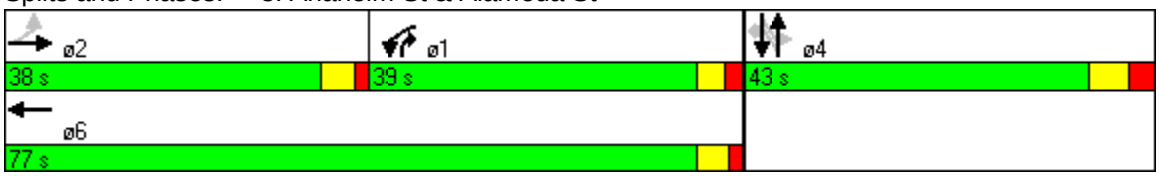
Lane Group	ø8
Lane Configurations	
Total Lost Time (s)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Volume (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	
Minimum Initial (s)	1.0
Minimum Split (s)	28.0
Total Split (s)	61.0
Total Split (%)	51%
Yellow Time (s)	4.0
All-Red Time (s)	1.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1805	3599	0	3502	3592	0	1805	3610	1615	1805	3610	1615
Flt Permitted	0.118			0.950			0.399			0.212		
Satd. Flow (perm)	224	3599	0	3502	3592	0	758	3610	1615	403	3610	1615
Satd. Flow (RTOR)		2			5				501			27
Volume (vph)	247	1250	28	1004	1581	50	69	676	915	31	413	451
Lane Group Flow (vph)	260	1345	0	1057	1717	0	73	712	963	33	435	475
Turn Type	Perm			Prot			Perm		Over	Perm		Perm
Protected Phases		2		1	6			4	1		4	
Permitted Phases	2						4			4		4
Detector Phases	2	2		1	6		4	4	1	4	4	4
Minimum Initial (s)	7.0	7.0		5.0	7.0		15.0	15.0	5.0	15.0	15.0	15.0
Minimum Split (s)	38.0	38.0		11.0	38.0		37.0	37.0	11.0	37.0	37.0	37.0
Total Split (s)	38.0	38.0	0.0	39.0	77.0	0.0	43.0	43.0	39.0	43.0	43.0	43.0
Total Split (%)	31.7%	31.7%	0.0%	32.5%	64.2%	0.0%	35.8%	35.8%	32.5%	35.8%	35.8%	35.8%
Yellow Time (s)	3.5	3.5		3.0	3.5		4.0	4.0	3.0	4.0	4.0	4.0
All-Red Time (s)	1.5	1.5		2.0	1.5		3.0	3.0	2.0	3.0	3.0	3.0
Lead/Lag	Lead	Lead		Lag					Lag			
Lead-Lag Optimize?	Yes	Yes		Yes					Yes			
Recall Mode	Min	Min		C-Max	C-Min		Min	Min	C-Max	Min	Min	Min
Act Effct Green (s)	36.3	36.3		35.0	75.3		36.7	36.7	35.0	36.7	36.7	36.7
Actuated g/C Ratio	0.30	0.30		0.29	0.63		0.31	0.31	0.29	0.31	0.31	0.31
v/c Ratio	3.88	1.24		1.04	0.76		0.31	0.64	1.17	0.27	0.39	0.93
Control Delay	1335.3	150.6		63.8	12.9		35.4	38.8	107.4	34.2	29.5	59.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1335.3	150.6		63.8	12.9		35.4	38.8	107.4	34.2	29.5	59.4
LOS	F	F		E	B		D	D	F	C	C	E
Approach Delay		342.5			32.3			76.4			44.7	
Approach LOS		F			C			E			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 114 (95%), Referenced to phase 1:WBL and 6:WBT, Start of Green	
Natural Cycle: 140	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 3.88	
Intersection Signal Delay: 115.3	Intersection LOS: F
Intersection Capacity Utilization 114.6%	ICU Level of Service H
Analysis Period (min) 15	

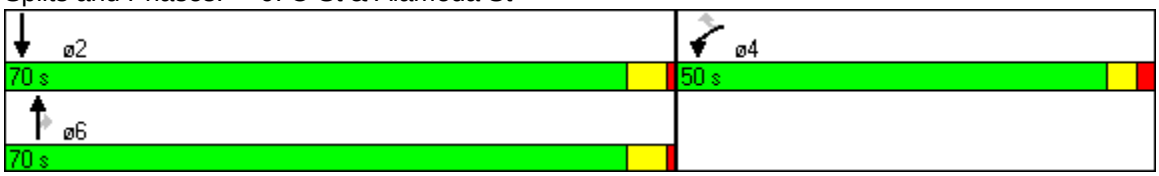
Splits and Phases: 8: Anaheim St & Alameda St



Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations											
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1805	0	1615	0	5187	1615	0	5187	0	0	0
Flt Permitted	0.950										
Satd. Flow (perm)	1805	0	1615	0	5187	1615	0	5187	0	0	0
Satd. Flow (RTOR)			66			422					
Volume (vph)	279	0	584	0	1096	401	0	801	0	0	0
Lane Group Flow (vph)	294	0	615	0	1154	422	0	843	0	0	0
Turn Type	Prot		custom			Perm					
Protected Phases	4				6			2			
Permitted Phases			4			6					
Detector Phases	4		4		6	6		2			
Minimum Initial (s)	5.0		5.0		10.0	10.0		10.0			
Minimum Split (s)	31.2		31.2		26.3	26.3		15.3			
Total Split (s)	50.0	0.0	50.0	0.0	70.0	70.0	0.0	70.0	0.0	0.0	0.0
Total Split (%)	41.7%	0.0%	41.7%	0.0%	58.3%	58.3%	0.0%	58.3%	0.0%	0.0%	0.0%
Yellow Time (s)	3.2		3.2		4.3	4.3		4.3			
All-Red Time (s)	2.0		2.0		1.0	1.0		1.0			
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	Max		Max		C-Min	C-Min		C-Min			
Act Effct Green (s)	62.2		62.2		49.8	49.8		49.8			
Actuated g/C Ratio	0.52		0.52		0.42	0.42		0.42			
v/c Ratio	0.31		0.71		0.54	0.46		0.39			
Control Delay	20.5		27.7		25.4	2.5		26.5			
Queue Delay	0.0		0.0		0.0	0.0		0.0			
Total Delay	20.5		27.7		25.4	2.5		26.5			
LOS	C		C		C	A		C			
Approach Delay					19.2			26.5			
Approach LOS					B			C			

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 31 (26%), Referenced to phase 2:SBT and 6:NBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 22.8	Intersection LOS: C
Intersection Capacity Utilization 64.0%	ICU Level of Service C
Analysis Period (min) 15	

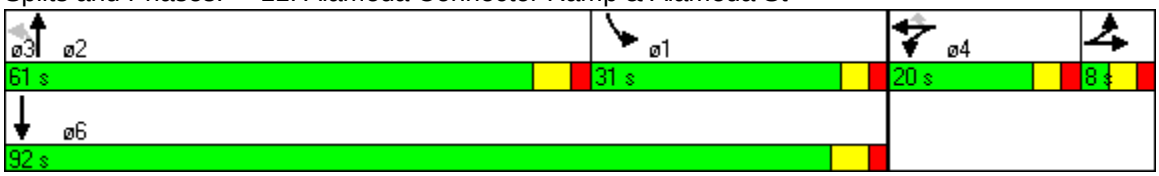
Splits and Phases: 9: O St & Alameda St



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	0	1854	0	1715	1470	1534	0	5140	0	1805	5187	0
Flt Permitted		0.976		0.950						0.950		
Satd. Flow (perm)	0	1854	0	1715	1470	1534	0	5140	0	1805	5187	0
Satd. Flow (RTOR)					370	370		12				
Volume (vph)	1	1	0	106	1	736	0	1702	112	577	1401	2
Lane Group Flow (vph)	0	2	0	112	388	388	0	1910	0	607	1477	0
Turn Type	Split			Split		Perm	Perm			Prot		
Protected Phases	3	3		4	4			2		1	6	
Permitted Phases						4	2					
Detector Phases	3	3		4	4	4	2	2		1	6	
Minimum Initial (s)	3.0	3.0		6.0	6.0	6.0	23.0	23.0		6.0	23.0	
Minimum Split (s)	8.0	8.0		20.0	20.0	20.0	29.0	29.0		11.0	29.0	
Total Split (s)	8.0	8.0	0.0	20.0	20.0	20.0	61.0	61.0	0.0	31.0	92.0	0.0
Total Split (%)	6.7%	6.7%	0.0%	16.7%	16.7%	16.7%	50.8%	50.8%	0.0%	25.8%	76.7%	0.0%
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lead	Lead		Lag		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes		
Recall Mode	None	None		None	None	None	C-Max	C-Max		None	C-Max	
Act Effct Green (s)		4.0		15.6	15.6	15.6		63.8		27.0	94.8	
Actuated g/C Ratio		0.03		0.13	0.13	0.13		0.53		0.22	0.79	
v/c Ratio		0.03		0.50	0.76	0.74		0.70		1.50	0.36	
Control Delay		57.5		41.3	15.4	14.9		15.1		262.9	3.0	
Queue Delay		0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay		57.5		41.3	15.4	14.9		15.1		262.9	3.0	
LOS		E		D	B	B		B		F	A	
Approach Delay		57.5			18.4			15.1			78.7	
Approach LOS		E			B			B			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 29 (24%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.50	
Intersection Signal Delay: 42.9	Intersection LOS: D
Intersection Capacity Utilization 88.8%	ICU Level of Service E
Analysis Period (min) 15	

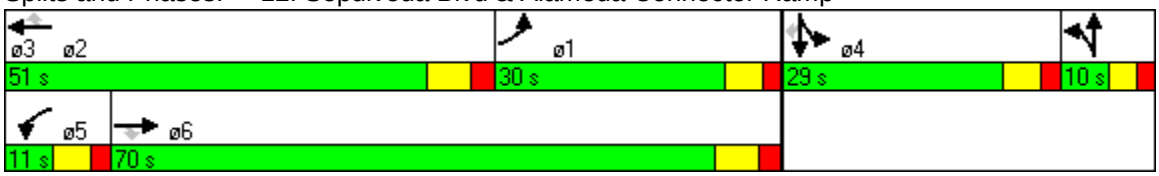
Splits and Phases: 11: Alameda Connector Ramp & Alameda St



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1805	3610	1900	1900	1900	1615	0	3610	0	1715	1715	1615
Flt Permitted	0.950									0.950	0.950	
Satd. Flow (perm)	1805	3610	1900	1900	1900	1615	0	3610	0	1715	1715	1615
Satd. Flow (RTOR)						300						425
Volume (vph)	443	660	0	0	785	434	0	0	0	339	0	404
Lane Group Flow (vph)	466	695	0	0	826	457	0	0	0	179	178	425
Turn Type	Prot		Perm	Prot		Perm	Split			Split		Perm
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases			6			2						4
Detector Phases	1	6	6	5	2	2	3	3		4	4	4
Minimum Initial (s)	5.0	23.0	23.0	5.0	23.0	23.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.0	30.0	30.0	11.0	30.0	30.0	10.0	10.0		29.0	29.0	29.0
Total Split (s)	30.0	70.0	70.0	11.0	51.0	51.0	10.0	10.0	0.0	29.0	29.0	29.0
Total Split (%)	25.0%	58.3%	58.3%	9.2%	42.5%	42.5%	8.3%	8.3%	0.0%	24.2%	24.2%	24.2%
Yellow Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	3.0	3.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.5	2.5	2.0	2.5	2.5	2.0	2.0		2.0	2.0	2.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	Max	Max		Max	Max	Max
Act Effct Green (s)	26.0	77.0			47.0	47.0				25.0	25.0	25.0
Actuated g/C Ratio	0.22	0.64			0.39	0.39				0.21	0.21	0.21
v/c Ratio	1.19	0.30			1.11	0.56				0.50	0.50	0.63
Control Delay	150.2	10.0			102.6	12.0				10.6	10.5	2.8
Queue Delay	0.0	0.0			0.0	0.0				0.0	0.0	0.0
Total Delay	150.2	10.0			102.6	12.0				10.6	10.5	2.8
LOS	F	A			F	B				B	B	A
Approach Delay		66.3			70.3						6.3	
Approach LOS		E			E						A	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 38 (32%), Referenced to phase 2:WBT and 6:EBT, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.19	
Intersection Signal Delay: 53.3	Intersection LOS: D
Intersection Capacity Utilization 85.2%	ICU Level of Service E
Analysis Period (min) 15	

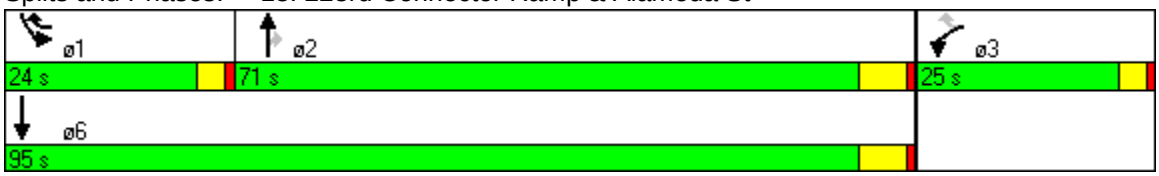
Splits and Phases: 12: Sepulveda Blvd & Alameda Connector Ramp



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	3502	1615	5187	1615	1805	5187
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3502	1615	5187	1615	1805	5187
Satd. Flow (RTOR)				607		
Volume (vph)	588	279	2883	887	288	2040
Lane Group Flow (vph)	619	294	3035	934	303	2147
Turn Type		pm+ov		Perm	Prot	
Protected Phases	3	1	2		1	6
Permitted Phases		3		2		
Detector Phases	3	1	2	2	1	6
Minimum Initial (s)	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	20.0	9.0	25.0	25.0	9.0	20.0
Total Split (s)	25.0	24.0	71.0	71.0	24.0	95.0
Total Split (%)	20.8%	20.0%	59.2%	59.2%	20.0%	79.2%
Yellow Time (s)	3.0	3.0	5.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag		Lead	Lag	Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	21.0	45.0	67.0	67.0	20.0	91.0
Actuated g/C Ratio	0.18	0.38	0.56	0.56	0.17	0.76
v/c Ratio	1.01	0.49	1.05	0.80	1.01	0.55
Control Delay	88.1	32.0	49.1	9.1	103.7	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.1	32.0	49.1	9.1	103.7	6.6
LOS	F	C	D	A	F	A
Approach Delay	70.1		39.7			18.6
Approach LOS	E		D			B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.05	
Intersection Signal Delay: 36.4	Intersection LOS: D
Intersection Capacity Utilization 98.4%	ICU Level of Service F
Analysis Period (min) 15	

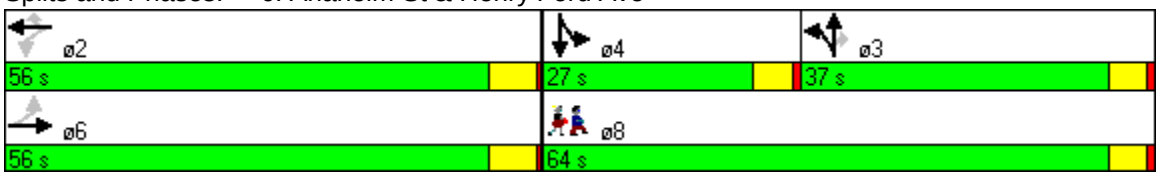
Splits and Phases: 13: 223rd Connector Ramp & Alameda St



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1805	5879	1615	1805	3610	1615	1643	3403	1615	1805	4933	0
Flt Permitted	0.077			0.077			0.950	0.984		0.950		
Satd. Flow (perm)	146	5879	1615	146	3610	1615	1643	3403	1615	1805	4933	0
Satd. Flow (RTOR)			153			80			85		9	
Volume (vph)	171	1476	250	91	1516	110	833	690	167	199	316	152
Lane Group Flow (vph)	180	1554	263	96	1596	116	516	1087	176	209	493	0
Turn Type	Perm		Free	Perm		Perm	Split		Perm	Split		
Protected Phases		6			2		3	3		4	4	
Permitted Phases	6		Free	2		2			3			
Detector Phases	6	6		2	2	2	3	3	3	4	4	
Minimum Initial (s)	20.0	20.0		20.0	20.0	20.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	28.5	28.5		28.5	28.5	28.5	10.5	10.5	10.5	19.0	19.0	
Total Split (s)	56.0	56.0	0.0	56.0	56.0	56.0	37.0	37.0	37.0	27.0	27.0	0.0
Total Split (%)	46.7%	46.7%	0.0%	46.7%	46.7%	46.7%	30.8%	30.8%	30.8%	22.5%	22.5%	0.0%
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.5	0.5		0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	
Lead/Lag							Lag	Lag	Lag	Lead	Lead	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Recall Mode	C-Min	C-Min		C-Min	C-Min	C-Min	None	None	None	None	None	
Act Effct Green (s)	52.0	52.0	120.0	52.0	52.0	52.0	38.4	38.4	38.4	17.6	17.6	
Actuated g/C Ratio	0.43	0.43	1.00	0.43	0.43	0.43	0.32	0.32	0.32	0.15	0.15	
v/c Ratio	2.86	0.61	0.16	1.52	1.02	0.16	0.98	1.00	0.31	0.79	0.67	
Control Delay	855.8	16.4	0.0	329.9	62.1	8.2	76.8	68.5	18.3	69.5	51.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	855.8	16.4	0.0	329.9	62.1	8.2	76.8	68.5	18.3	69.5	51.9	
LOS	F	B	A	F	E	A	E	E	B	E	D	
Approach Delay		89.9			72.8			65.9			57.1	
Approach LOS		F			E			E			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 6 (5%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.86	
Intersection Signal Delay: 74.6	Intersection LOS: E
Intersection Capacity Utilization 111.8%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 6: Anaheim St & Henry Ford Ave



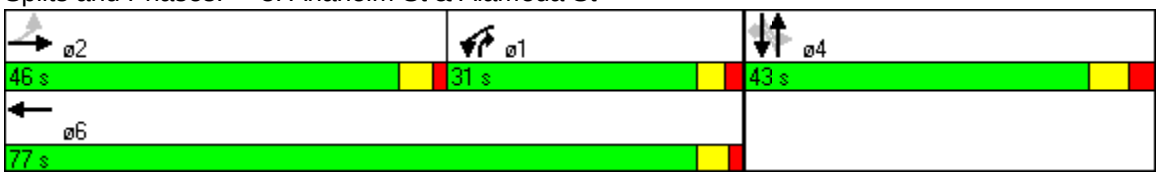
Lane Group	ø8
Lane Configurations	
Total Lost Time (s)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Volume (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	
Minimum Initial (s)	1.0
Minimum Split (s)	28.0
Total Split (s)	64.0
Total Split (%)	53%
Yellow Time (s)	4.0
All-Red Time (s)	1.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1805	3599	0	3502	3596	0	1805	3610	1615	1805	3610	1615
Flt Permitted	0.095			0.950			0.430			0.214		
Satd. Flow (perm)	180	3599	0	3502	3596	0	817	3610	1615	407	3610	1615
Satd. Flow (RTOR)		2			5				451			20
Volume (vph)	249	1269	26	946	1689	51	73	674	921	31	377	467
Lane Group Flow (vph)	262	1363	0	996	1832	0	77	709	969	33	397	492
Turn Type	Perm			Prot			Perm		Over	Perm		Perm
Protected Phases		2		1	6			4	1		4	
Permitted Phases	2						4			4		4
Detector Phases	2	2		1	6		4	4	1	4	4	4
Minimum Initial (s)	7.0	7.0		5.0	7.0		15.0	15.0	5.0	15.0	15.0	15.0
Minimum Split (s)	38.0	38.0		11.0	38.0		37.0	37.0	11.0	37.0	37.0	37.0
Total Split (s)	46.0	46.0	0.0	31.0	77.0	0.0	43.0	43.0	31.0	43.0	43.0	43.0
Total Split (%)	38.3%	38.3%	0.0%	25.8%	64.2%	0.0%	35.8%	35.8%	25.8%	35.8%	35.8%	35.8%
Yellow Time (s)	3.5	3.5		3.0	3.5		4.0	4.0	3.0	4.0	4.0	4.0
All-Red Time (s)	1.5	1.5		2.0	1.5		3.0	3.0	2.0	3.0	3.0	3.0
Lead/Lag	Lead	Lead		Lag					Lag			
Lead-Lag Optimize?	Yes	Yes		Yes					Yes			
Recall Mode	Min	Min		C-Max	C-Min		Min	Min	C-Max	Min	Min	Min
Act Effct Green (s)	42.6	42.6		27.0	73.6		38.4	38.4	27.0	38.4	38.4	38.4
Actuated g/C Ratio	0.36	0.36		0.22	0.61		0.32	0.32	0.22	0.32	0.32	0.32
v/c Ratio	4.09	1.07		1.26	0.83		0.29	0.61	1.36	0.25	0.34	0.93
Control Delay	1447.7	82.5		157.2	15.0		34.1	37.1	191.5	32.3	28.5	58.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1447.7	82.5		157.2	15.0		34.1	37.1	191.5	32.3	28.5	58.7
LOS	F	F		F	B		C	D	F	C	C	E
Approach Delay		302.6			65.1			122.2			44.8	
Approach LOS		F			E			F			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 40 (33%), Referenced to phase 1:WBL and 6:WBT, Start of Green	
Natural Cycle: 130	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 4.09	
Intersection Signal Delay: 130.7	Intersection LOS: F
Intersection Capacity Utilization 115.4%	ICU Level of Service H
Analysis Period (min) 15	

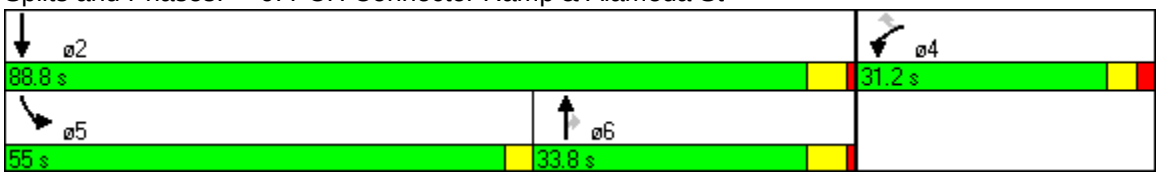
Splits and Phases: 8: Anaheim St & Alameda St



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1805	1615	5187	1615	1805	5187
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1805	1615	5187	1615	1805	5187
Satd. Flow (RTOR)		705		304		
Volume (vph)	265	785	1216	309	757	840
Lane Group Flow (vph)	279	826	1280	325	797	884
Turn Type		Perm		Perm	Prot	
Protected Phases	4		6		5	2
Permitted Phases		4		6		
Detector Phases	4	4	6	6	5	2
Minimum Initial (s)	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	31.2	31.2	26.3	26.3	19.0	15.3
Total Split (s)	31.2	31.2	33.8	33.8	55.0	88.8
Total Split (%)	26.0%	26.0%	28.2%	28.2%	45.8%	74.0%
Yellow Time (s)	3.2	3.2	4.3	4.3	3.0	4.3
All-Red Time (s)	2.0	2.0	1.0	1.0	0.0	1.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	Max	Max	C-Min	C-Min	Max	C-Min
Act Effct Green (s)	27.2	27.2	29.8	29.8	51.0	84.8
Actuated g/C Ratio	0.23	0.23	0.25	0.25	0.42	0.71
v/c Ratio	0.68	0.91	0.99	0.52	1.04	0.24
Control Delay	59.8	26.8	66.5	7.5	75.6	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.8	26.8	66.5	7.5	75.6	6.2
LOS	E	C	E	A	E	A
Approach Delay	35.1		54.5			39.1
Approach LOS	D		D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 48 (40%), Referenced to phase 2:SBT and 6:NBT, Start of Green	
Natural Cycle: 130	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.04	
Intersection Signal Delay: 43.7	Intersection LOS: D
Intersection Capacity Utilization 90.1%	ICU Level of Service E
Analysis Period (min) 15	

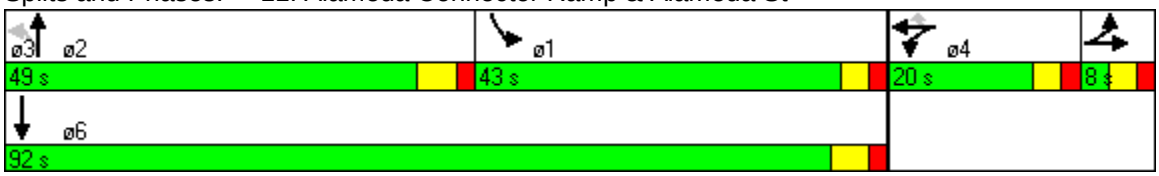
Splits and Phases: 9: PCH Connector Ramp & Alameda St



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	0	1854	0	1715	1470	1534	0	6477	0	1805	5187	0
Flt Permitted		0.976		0.950						0.950		
Satd. Flow (perm)	0	1854	0	1715	1470	1534	0	6477	0	1805	5187	0
Satd. Flow (RTOR)					524	524		12				
Volume (vph)	1	1	0	128	1	1006	0	2151	137	731	1623	2
Lane Group Flow (vph)	0	2	0	135	530	530	0	2408	0	769	1710	0
Turn Type	Split			Split		Perm	Perm			Prot		
Protected Phases	3	3		4	4			2		1	6	
Permitted Phases						4	2					
Detector Phases	3	3		4	4	4	2	2		1	6	
Minimum Initial (s)	3.0	3.0		6.0	6.0	6.0	23.0	23.0		6.0	23.0	
Minimum Split (s)	8.0	8.0		20.0	20.0	20.0	29.0	29.0		11.0	29.0	
Total Split (s)	8.0	8.0	0.0	20.0	20.0	20.0	49.0	49.0	0.0	43.0	92.0	0.0
Total Split (%)	6.7%	6.7%	0.0%	16.7%	16.7%	16.7%	40.8%	40.8%	0.0%	35.8%	76.7%	0.0%
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lead	Lead		Lag		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes		
Recall Mode	None	None		None	None	None	C-Max	C-Max		None	C-Max	
Act Effct Green (s)		4.0		16.0	16.0	16.0		51.4		39.0	94.4	
Actuated g/C Ratio		0.03		0.13	0.13	0.13		0.43		0.32	0.79	
v/c Ratio		0.03		0.59	0.82	0.80		0.87		1.31	0.42	
Control Delay		57.5		39.4	13.0	12.5		16.4		182.2	4.0	
Queue Delay		0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay		57.5		39.4	13.0	12.5		16.4		182.2	4.0	
LOS		E		D	B	B		B		F	A	
Approach Delay		57.5			15.7			16.4			59.3	
Approach LOS		E			B			B			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 52 (43%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.31	
Intersection Signal Delay: 33.8	Intersection LOS: C
Intersection Capacity Utilization 98.9%	ICU Level of Service F
Analysis Period (min) 15	

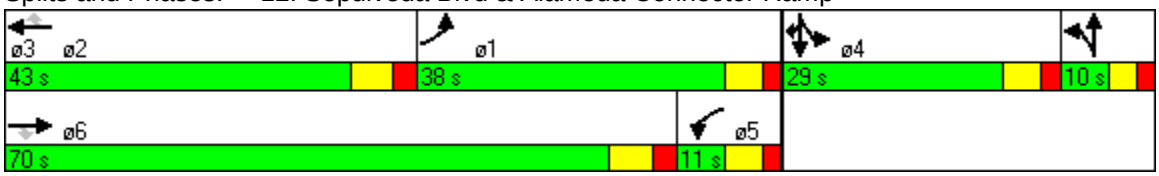
Splits and Phases: 11: Alameda Connector Ramp & Alameda St



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1805	3610	1900	1900	1900	1615	0	3610	0	1715	1715	1615
Flt Permitted	0.950									0.950	0.950	
Satd. Flow (perm)	1805	3610	1900	1900	1900	1615	0	3610	0	1715	1715	1615
Satd. Flow (RTOR)						447						515
Volume (vph)	576	558	0	0	641	586	0	0	0	441	0	489
Lane Group Flow (vph)	606	587	0	0	675	617	0	0	0	232	232	515
Turn Type	Prot		Perm	Prot		Perm	Split			Split		Prot
Protected Phases	1	6		5	2		3	3		4	4	4
Permitted Phases			6			2						
Detector Phases	1	6	6	5	2	2	3	3		4	4	4
Minimum Initial (s)	5.0	23.0	23.0	5.0	23.0	23.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.0	30.0	30.0	11.0	30.0	30.0	10.0	10.0		29.0	29.0	29.0
Total Split (s)	38.0	70.0	70.0	11.0	43.0	43.0	10.0	10.0	0.0	29.0	29.0	29.0
Total Split (%)	31.7%	58.3%	58.3%	9.2%	35.8%	35.8%	8.3%	8.3%	0.0%	24.2%	24.2%	24.2%
Yellow Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	3.0	3.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.5	2.5	2.0	2.5	2.5	2.0	2.0		2.0	2.0	2.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lag		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	Max	Max		Max	Max	Max
Act Effct Green (s)	34.0	77.0			39.0	39.0				25.0	25.0	25.0
Actuated g/C Ratio	0.28	0.64			0.32	0.32				0.21	0.21	0.21
v/c Ratio	1.19	0.25			1.09	0.75				0.65	0.65	0.69
Control Delay	140.6	9.5			102.7	15.8				20.3	20.3	8.5
Queue Delay	0.0	0.0			0.0	0.0				0.0	0.0	0.0
Total Delay	140.6	9.5			102.7	15.8				20.3	20.3	8.5
LOS	F	A			F	B				C	C	A
Approach Delay		76.1			61.2						14.1	
Approach LOS		E			E						B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 56 (47%), Referenced to phase 2:WBT and 6:EBT, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.19	
Intersection Signal Delay: 53.0	Intersection LOS: D
Intersection Capacity Utilization 87.9%	ICU Level of Service E
Analysis Period (min) 15	

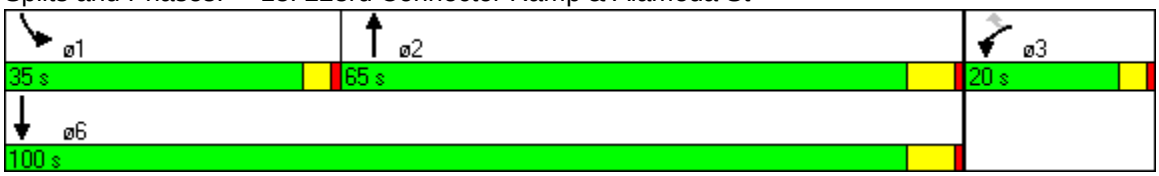
Splits and Phases: 12: Sepulveda Blvd & Alameda Connector Ramp



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1805	1615	5099	0	1805	5187
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1805	1615	5099	0	1805	5187
Satd. Flow (RTOR)		377	28			
Volume (vph)	220	484	2269	299	481	1711
Lane Group Flow (vph)	232	509	2703	0	506	1801
Turn Type		Perm			Prot	
Protected Phases	3		2		1	6
Permitted Phases		3				
Detector Phases	3	3	2		1	6
Minimum Initial (s)	10.0	10.0	10.0		5.0	10.0
Minimum Split (s)	20.0	20.0	25.0		9.0	20.0
Total Split (s)	20.0	20.0	65.0	0.0	35.0	100.0
Total Split (%)	16.7%	16.7%	54.2%	0.0%	29.2%	83.3%
Yellow Time (s)	3.0	3.0	5.0		3.0	5.0
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	C-Min		None	C-Min
Act Effct Green (s)	16.0	16.0	61.0		31.0	96.0
Actuated g/C Ratio	0.13	0.13	0.51		0.26	0.80
v/c Ratio	0.96	0.94	1.04		1.09	0.43
Control Delay	102.2	41.6	37.0		109.2	4.0
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	102.2	41.6	37.0		109.2	4.0
LOS	F	D	D		F	A
Approach Delay	60.6		37.0			27.1
Approach LOS	E		D			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 36 (30%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 130	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.09	
Intersection Signal Delay: 36.0	Intersection LOS: D
Intersection Capacity Utilization 99.3%	ICU Level of Service F
Analysis Period (min) 15	

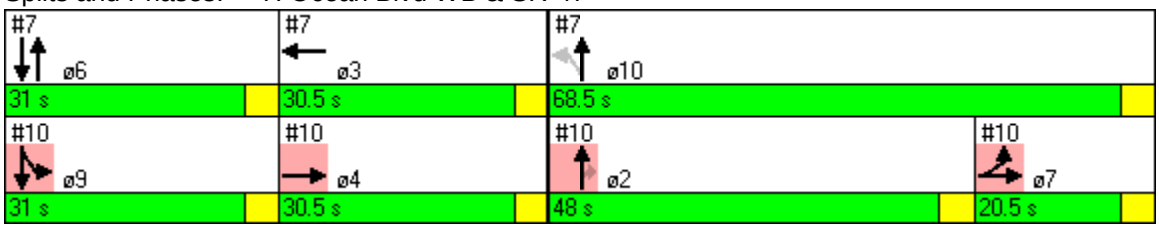
Splits and Phases: 13: 223rd Connector Ramp & Alameda St



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	0	0	0	0	3610	1615	1805	3610	0	0	3458	2842
Flt Permitted							0.580					
Satd. Flow (perm)	0	0	0	0	3610	1615	1102	3610	0	0	3458	2842
Satd. Flow (RTOR)						312						1134
Volume (vph)	0	0	0	0	100	852	70	1470	0	0	268	1134
Lane Group Flow (vph)	0	0	0	0	100	852	70	1470	0	0	268	1134
Turn Type						Free	custom					Free
Protected Phases					3			10 6			6	
Permitted Phases						Free	10					Free
Detector Phases					3		10	10 6			6	
Minimum Initial (s)					8.0		8.0				8.0	
Minimum Split (s)					21.5		21.5				21.5	
Total Split (s)	0.0	0.0	0.0	0.0	30.5	0.0	68.5	99.5	0.0	0.0	31.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	23.5%	0.0%	52.7%	76.5%	0.0%	0.0%	23.8%	0.0%
Yellow Time (s)					4.0		4.0				4.0	
All-Red Time (s)					0.0		0.0				0.0	
Lead/Lag					Lag						Lead	
Lead-Lag Optimize?											Yes	
Recall Mode					None		Min				Min	
Act Effct Green (s)					13.6	130.0	90.0	108.4			14.4	130.0
Actuated g/C Ratio					0.10	1.00	0.69	0.83			0.11	1.00
v/c Ratio					0.26	0.53	0.09	0.49			0.70	0.40
Control Delay					54.8	1.2	1.1	0.9			65.7	0.4
Queue Delay					0.0	0.0	1.3	0.2			0.0	0.0
Total Delay					54.8	1.2	2.4	1.0			65.7	0.4
LOS					D	A	A	A			E	A
Approach Delay					6.9			1.1			12.9	
Approach LOS					A			A			B	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 44 (34%), Referenced to phase 7:EBTL, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 6.8	Intersection LOS: A
Intersection Capacity Utilization 62.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 7: Ocean Blvd WB & SR-47



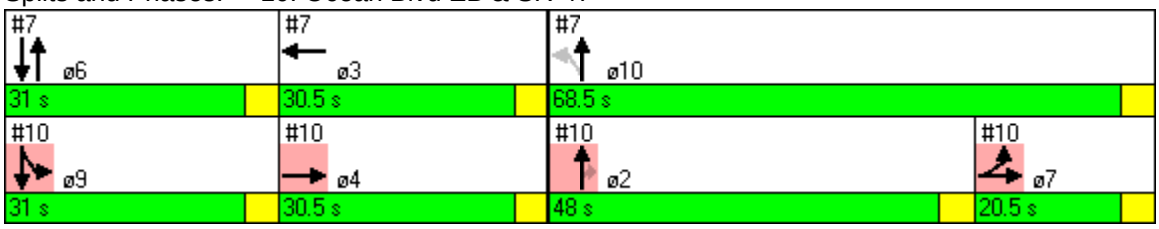
Lane Group	ø2	ø4	ø7	ø9
Lane Configurations				
Total Lost Time (s)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Volume (vph)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	2	4	7	9
Permitted Phases				
Detector Phases				
Minimum Initial (s)	8.0	8.0	6.0	8.0
Minimum Split (s)	21.5	21.5	11.5	21.5
Total Split (s)	48.0	30.5	20.5	31.0
Total Split (%)	37%	23%	16%	24%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lead/Lag	Lead	Lag	Lag	Lead
Lead-Lag Optimize?				
Recall Mode	Min	None	C-Max	Min
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	3285	3393	0	0	0	0	0	5187	1615	3285	3610	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	3285	3393	0	0	0	0	0	5187	1615	3285	3610	0
Satd. Flow (RTOR)		88							24			
Volume (vph)	1216	131	88	0	0	0	0	324	24	183	86	0
Lane Group Flow (vph)	1216	219	0	0	0	0	0	324	24	183	86	0
Turn Type	Prot								Perm	Split		
Protected Phases	7	4 7						2		9	9	
Permitted Phases									2			
Detector Phases	7	4 7						2	2	9	9	
Minimum Initial (s)	6.0							8.0	8.0	8.0	8.0	
Minimum Split (s)	11.5							21.5	21.5	21.5	21.5	
Total Split (s)	20.5	51.0	0.0	0.0	0.0	0.0	0.0	48.0	48.0	31.0	31.0	0.0
Total Split (%)	15.8%	39.2%	0.0%	0.0%	0.0%	0.0%	0.0%	36.9%	36.9%	23.8%	23.8%	0.0%
Yellow Time (s)	4.0							4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0							0.0	0.0	0.0	0.0	
Lead/Lag	Lag							Lead	Lead	Lead	Lead	
Lead-Lag Optimize?												
Recall Mode	C-Max							Min	Min	Min	Min	
Act Effct Green (s)	73.6	82.1						12.5	12.5	19.5	19.5	
Actuated g/C Ratio	0.57	0.63						0.10	0.10	0.15	0.15	
v/c Ratio	0.65	0.10						0.65	0.14	0.37	0.16	
Control Delay	14.5	2.2						62.9	20.5	4.8	2.2	
Queue Delay	0.0	0.0						0.0	0.0	0.3	0.2	
Total Delay	14.5	2.2						62.9	20.5	5.1	2.5	
LOS	B	A						E	C	A	A	
Approach Delay		12.7						60.0			4.3	
Approach LOS		B						E			A	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 44 (34%), Referenced to phase 7:EBTL, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 19.6	Intersection LOS: B
Intersection Capacity Utilization 62.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 10: Ocean Blvd EB & SR-47



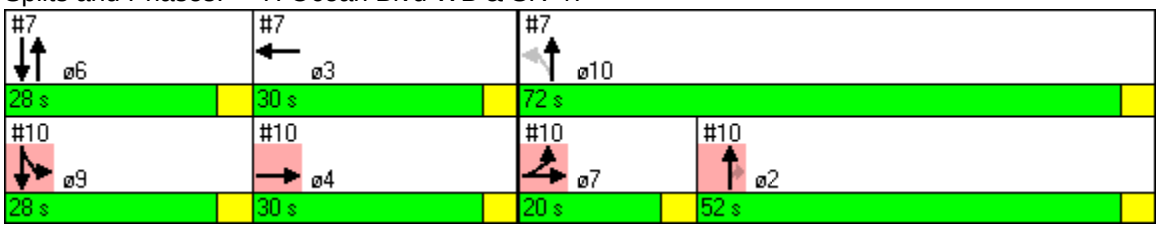
Lane Group	ø3	ø4	ø6	ø10
Lane Configurations				
Total Lost Time (s)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Volume (vph)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	3	4	6	10
Permitted Phases				
Detector Phases				
Minimum Initial (s)	8.0	8.0	8.0	8.0
Minimum Split (s)	21.5	21.5	21.5	21.5
Total Split (s)	30.5	30.5	31.0	68.5
Total Split (%)	23%	23%	24%	53%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lead/Lag	Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	
Recall Mode	None	None	Min	Min
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	0	0	0	0	3610	1615	1805	3610	0	0	3458	2842
Flt Permitted							0.615					
Satd. Flow (perm)	0	0	0	0	3610	1615	1168	3610	0	0	3458	2842
Satd. Flow (RTOR)						307						929
Volume (vph)	0	0	0	0	105	524	79	1477	0	0	209	929
Lane Group Flow (vph)	0	0	0	0	105	524	79	1477	0	0	209	929
Turn Type						Free	custom					Free
Protected Phases					3			10 6			6	
Permitted Phases						Free	10					Free
Detector Phases					3		10	10 6			6	
Minimum Initial (s)					8.0		8.0				8.0	
Minimum Split (s)					21.5		21.5				21.5	
Total Split (s)	0.0	0.0	0.0	0.0	30.0	0.0	72.0	100.0	0.0	0.0	28.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	23.1%	0.0%	55.4%	76.9%	0.0%	0.0%	21.5%	0.0%
Yellow Time (s)					4.0		4.0				4.0	
All-Red Time (s)					0.0		0.0				0.0	
Lead/Lag					Lag						Lead	
Lead-Lag Optimize?											Yes	
Recall Mode					None		Min				Min	
Act Effct Green (s)					11.0	130.0	94.6	111.0			12.5	130.0
Actuated g/C Ratio					0.08	1.00	0.73	0.85			0.10	1.00
v/c Ratio					0.34	0.32	0.09	0.48			0.63	0.33
Control Delay					59.2	0.5	0.4	1.9			65.0	0.3
Queue Delay					0.0	0.0	1.8	0.4			0.0	0.0
Total Delay					59.2	0.5	2.2	2.3			65.0	0.3
LOS					E	A	A	A			E	A
Approach Delay					10.3			2.3			12.2	
Approach LOS					B			A			B	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 74 (57%), Referenced to phase 7:EBTL, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 7.2	Intersection LOS: A
Intersection Capacity Utilization 62.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 7: Ocean Blvd WB & SR-47



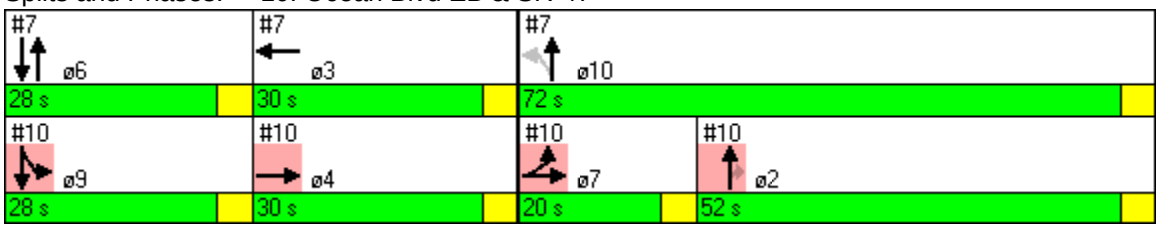
Lane Group	ø2	ø4	ø7	ø9
Lane Configurations				
Total Lost Time (s)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Volume (vph)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	2	4	7	9
Permitted Phases				
Detector Phases				
Minimum Initial (s)	8.0	8.0	6.0	8.0
Minimum Split (s)	21.5	21.5	11.5	21.5
Total Split (s)	52.0	30.0	20.0	28.0
Total Split (%)	40%	23%	15%	22%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lead/Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?				
Recall Mode	Min	None	C-Max	Min
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	3285	3383	0	0	0	0	0	5187	1615	3285	3610	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	3285	3383	0	0	0	0	0	5187	1615	3285	3610	0
Satd. Flow (RTOR)		90							25			
Volume (vph)	1236	126	90	0	0	0	0	317	25	125	84	0
Lane Group Flow (vph)	1236	216	0	0	0	0	0	317	25	125	84	0
Turn Type	Prot								Perm	Split		
Protected Phases	7	4 7						2		9	9	
Permitted Phases									2			
Detector Phases	7	4 7						2	2	9	9	
Minimum Initial (s)	6.0							8.0	8.0	8.0	8.0	
Minimum Split (s)	11.5							21.5	21.5	21.5	21.5	
Total Split (s)	20.0	50.0	0.0	0.0	0.0	0.0	0.0	52.0	52.0	28.0	28.0	0.0
Total Split (%)	15.4%	38.5%	0.0%	0.0%	0.0%	0.0%	0.0%	40.0%	40.0%	21.5%	21.5%	0.0%
Yellow Time (s)	4.0							4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0							0.0	0.0	0.0	0.0	
Lead/Lag	Lead							Lag	Lag	Lead	Lead	
Lead-Lag Optimize?												
Recall Mode	C-Max							Min	Min	Min	Min	
Act Effct Green (s)	52.4	65.0						38.1	38.1	14.8	14.8	
Actuated g/C Ratio	0.40	0.50						0.29	0.29	0.11	0.11	
v/c Ratio	0.93	0.12						0.21	0.05	0.33	0.20	
Control Delay	41.5	8.1						33.8	10.1	3.0	2.0	
Queue Delay	1.1	0.0						0.0	0.0	0.1	0.1	
Total Delay	42.6	8.1						33.8	10.1	3.1	2.1	
LOS	D	A						C	B	A	A	
Approach Delay		37.5						32.1			2.7	
Approach LOS		D						C			A	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 74 (57%), Referenced to phase 7:EBTL, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 32.9	Intersection LOS: C
Intersection Capacity Utilization 62.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 10: Ocean Blvd EB & SR-47



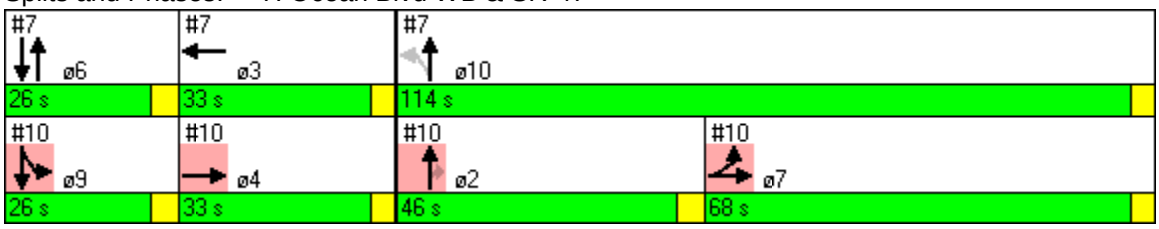
Lane Group	ø3	ø4	ø6	ø10
Lane Configurations				
Total Lost Time (s)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Volume (vph)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	3	4	6	10
Permitted Phases				
Detector Phases				
Minimum Initial (s)	8.0	8.0	8.0	8.0
Minimum Split (s)	21.5	21.5	21.5	21.5
Total Split (s)	30.0	30.0	28.0	72.0
Total Split (%)	23%	23%	22%	55%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lead/Lag	Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	
Recall Mode	None	None	Min	Min
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	0	0	0	0	3610	1615	1805	3610	0	0	3458	2842
Flt Permitted							0.646					
Satd. Flow (perm)	0	0	0	0	3610	1615	1227	3610	0	0	3458	2842
Satd. Flow (RTOR)						219						519
Volume (vph)	0	0	0	0	146	219	82	1240	0	0	161	519
Lane Group Flow (vph)	0	0	0	0	146	219	82	1240	0	0	161	519
Turn Type						Free	custom					Free
Protected Phases					3			10 6			6	
Permitted Phases						Free	10					Free
Detector Phases					3		10	10 6			6	
Minimum Initial (s)					8.0		8.0				8.0	
Minimum Split (s)					21.5		21.5				21.5	
Total Split (s)	0.0	0.0	0.0	0.0	33.0	0.0	114.0	140.0	0.0	0.0	26.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	19.1%	0.0%	65.9%	80.9%	0.0%	0.0%	15.0%	0.0%
Yellow Time (s)					4.0		4.0				4.0	
All-Red Time (s)					0.0		0.0				0.0	
Lead/Lag					Lag						Lead	
Lead-Lag Optimize?											Yes	
Recall Mode					None		Min				Min	
Act Effct Green (s)					12.5	173.0	135.5	152.5			13.0	173.0
Actuated g/C Ratio					0.07	1.00	0.78	0.88			0.08	1.00
v/c Ratio					0.56	0.14	0.09	0.39			0.62	0.18
Control Delay					85.4	0.2	0.8	0.6			88.0	0.1
Queue Delay					0.0	0.0	1.2	0.1			0.0	0.0
Total Delay					85.4	0.2	1.9	0.7			88.0	0.1
LOS					F	A	A	A			F	A
Approach Delay					34.3			0.8			20.9	
Approach LOS					C			A			C	

Intersection Summary	
Cycle Length: 173	
Actuated Cycle Length: 173	
Offset: 0 (0%), Referenced to phase 7:EBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 11.7	Intersection LOS: B
Intersection Capacity Utilization 57.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 7: Ocean Blvd WB & SR-47



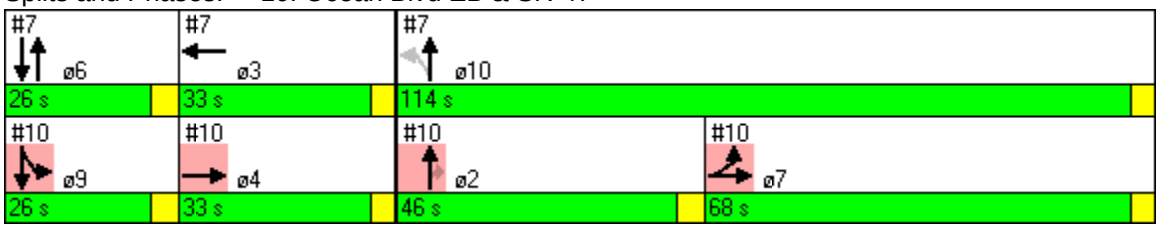
Lane Group	ø2	ø4	ø7	ø9
Lane Configurations				
Total Lost Time (s)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Volume (vph)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	2	4	7	9
Permitted Phases				
Detector Phases				
Minimum Initial (s)	8.0	8.0	6.0	8.0
Minimum Split (s)	21.5	21.5	11.5	21.5
Total Split (s)	46.0	33.0	68.0	26.0
Total Split (%)	27%	19%	39%	15%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lead/Lag	Lead	Lag	Lag	Lead
Lead-Lag Optimize?				
Recall Mode	Min	None	C-Max	Min
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	3285	3448	0	0	0	0	0	5187	1615	3285	3610	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	3285	3448	0	0	0	0	0	5187	1615	3285	3610	0
Satd. Flow (RTOR)		59							31			
Volume (vph)	1051	226	96	0	0	0	0	270	31	99	62	0
Lane Group Flow (vph)	1051	322	0	0	0	0	0	270	31	99	62	0
Turn Type	Prot								Perm	Split		
Protected Phases	7	4 7						2		9	9	
Permitted Phases									2			
Detector Phases	7	4 7						2	2	9	9	
Minimum Initial (s)	6.0							8.0	8.0	8.0	8.0	
Minimum Split (s)	11.5							21.5	21.5	21.5	21.5	
Total Split (s)	68.0	101.0	0.0	0.0	0.0	0.0	0.0	46.0	46.0	26.0	26.0	0.0
Total Split (%)	39.3%	58.4%	0.0%	0.0%	0.0%	0.0%	0.0%	26.6%	26.6%	15.0%	15.0%	0.0%
Yellow Time (s)	4.0							4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0							0.0	0.0	0.0	0.0	
Lead/Lag	Lag							Lead	Lead	Lead	Lead	
Lead-Lag Optimize?												
Recall Mode	C-Max							Min	Min	Min	Min	
Act Effct Green (s)	117.9	129.8						13.6	13.6	13.6	13.6	
Actuated g/C Ratio	0.68	0.75						0.08	0.08	0.08	0.08	
v/c Ratio	0.47	0.12						0.66	0.20	0.38	0.22	
Control Delay	14.6	2.9						85.4	24.1	26.6	23.7	
Queue Delay	1.6	0.0						0.0	0.0	0.1	0.1	
Total Delay	16.2	2.9						85.4	24.1	26.7	23.9	
LOS	B	A						F	C	C	C	
Approach Delay		13.0						79.1			25.6	
Approach LOS		B						E			C	

Intersection Summary	
Cycle Length: 173	
Actuated Cycle Length: 173	
Offset: 0 (0%), Referenced to phase 7:EBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 25.0	Intersection LOS: C
Intersection Capacity Utilization 57.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 10: Ocean Blvd EB & SR-47



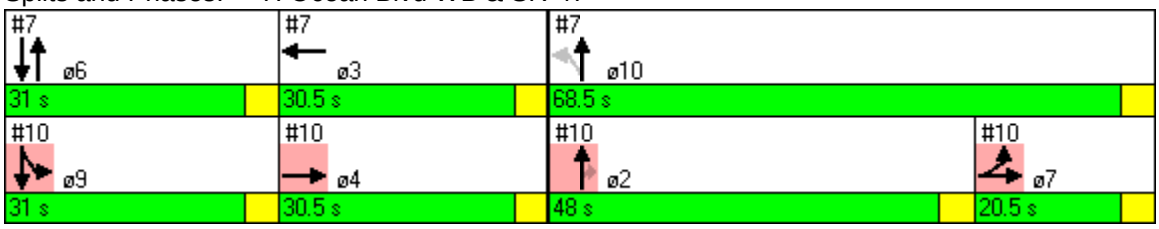
Lane Group	ø3	ø4	ø6	ø10
Lane Configurations				
Total Lost Time (s)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Volume (vph)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	3	4	6	10
Permitted Phases				
Detector Phases				
Minimum Initial (s)	8.0	8.0	8.0	8.0
Minimum Split (s)	21.5	21.5	21.5	21.5
Total Split (s)	33.0	33.0	26.0	114.0
Total Split (%)	19%	19%	15%	66%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lead/Lag	Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	
Recall Mode	None	None	Min	Min
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	0	0	0	0	3610	1615	1805	3610	0	0	3458	2842
Flt Permitted							0.511					
Satd. Flow (perm)	0	0	0	0	3610	1615	971	3610	0	0	3458	2842
Satd. Flow (RTOR)						608						1146
Volume (vph)	0	0	0	0	117	767	66	490	0	0	393	1146
Lane Group Flow (vph)	0	0	0	0	117	767	66	490	0	0	393	1146
Turn Type						Free	custom					Free
Protected Phases					3			10 6			6	
Permitted Phases						Free	10					Free
Detector Phases					3		10	10 6			6	
Minimum Initial (s)					8.0		8.0				8.0	
Minimum Split (s)					21.5		21.5				21.5	
Total Split (s)	0.0	0.0	0.0	0.0	30.5	0.0	68.5	99.5	0.0	0.0	31.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	23.5%	0.0%	52.7%	76.5%	0.0%	0.0%	23.8%	0.0%
Yellow Time (s)					4.0		4.0				4.0	
All-Red Time (s)					0.0		0.0				0.0	
Lead/Lag					Lag						Lead	
Lead-Lag Optimize?											Yes	
Recall Mode					None		Min				Min	
Act Effct Green (s)					14.6	130.0	84.3	107.4			19.1	130.0
Actuated g/C Ratio					0.11	1.00	0.65	0.83			0.15	1.00
v/c Ratio					0.29	0.47	0.10	0.16			0.77	0.40
Control Delay					55.6	1.0	0.2	2.0			63.8	0.4
Queue Delay					0.0	0.0	2.2	0.8			0.0	0.0
Total Delay					55.6	1.0	2.4	2.8			63.8	0.4
LOS					E	A	A	A			E	A
Approach Delay					8.2			2.8			16.6	
Approach LOS					A			A			B	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 44 (34%), Referenced to phase 7:EBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 11.5	Intersection LOS: B
Intersection Capacity Utilization 36.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 7: Ocean Blvd WB & SR-47



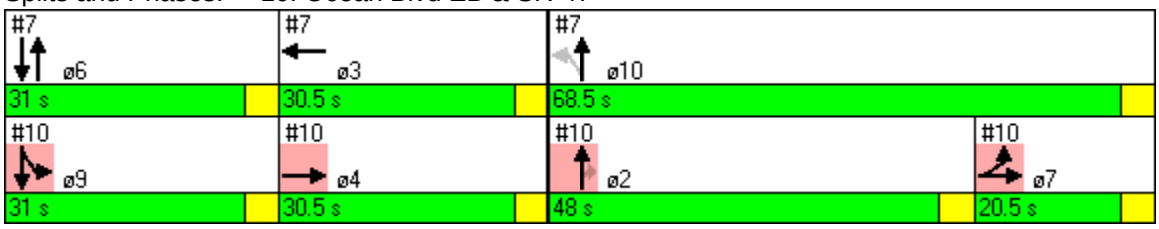
Lane Group	ø2	ø4	ø7	ø9
Lane Configurations				
Total Lost Time (s)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Volume (vph)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	2	4	7	9
Permitted Phases				
Detector Phases				
Minimum Initial (s)	8.0	8.0	6.0	8.0
Minimum Split (s)	21.5	21.5	11.5	21.5
Total Split (s)	48.0	30.5	20.5	31.0
Total Split (%)	37%	23%	16%	24%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lead/Lag	Lead	Lag	Lag	Lead
Lead-Lag Optimize?				
Recall Mode	Min	None	C-Max	Min
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	3458	3444	0	0	0	0	0	5187	1615	3285	3610	0
Flt Permitted										0.950		
Satd. Flow (perm)	3458	3444	0	0	0	0	0	5187	1615	3285	3610	0
Satd. Flow (RTOR)		58							35			
Volume (vph)	0	197	87	0	0	0	0	556	35	253	140	0
Lane Group Flow (vph)	0	284	0	0	0	0	0	556	35	253	140	0
Turn Type	Prot								Perm	Split		
Protected Phases	7	4 7						2		9	9	
Permitted Phases									2			
Detector Phases	7	4 7						2	2	9	9	
Minimum Initial (s)	6.0							8.0	8.0	8.0	8.0	
Minimum Split (s)	11.5							21.5	21.5	21.5	21.5	
Total Split (s)	20.5	51.0	0.0	0.0	0.0	0.0	0.0	48.0	48.0	31.0	31.0	0.0
Total Split (%)	15.8%	39.2%	0.0%	0.0%	0.0%	0.0%	0.0%	36.9%	36.9%	23.8%	23.8%	0.0%
Yellow Time (s)	4.0							4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0							0.0	0.0	0.0	0.0	
Lead/Lag	Lag							Lead	Lead	Lead	Lead	
Lead-Lag Optimize?												
Recall Mode	C-Max							Min	Min	Min	Min	
Act Effct Green (s)		70.4						18.2	18.2	25.5	25.5	
Actuated g/C Ratio		0.54						0.14	0.14	0.20	0.20	
v/c Ratio		0.15						0.77	0.14	0.39	0.20	
Control Delay		3.4						61.2	15.4	1.3	0.6	
Queue Delay		0.0						0.0	0.0	0.8	0.8	
Total Delay		3.4						61.2	15.4	2.1	1.4	
LOS		A						E	B	A	A	
Approach Delay		3.4						58.5			1.9	
Approach LOS		A						E			A	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 44 (34%), Referenced to phase 7:EBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 28.6	Intersection LOS: C
Intersection Capacity Utilization 36.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 10: Ocean Blvd EB & SR-47



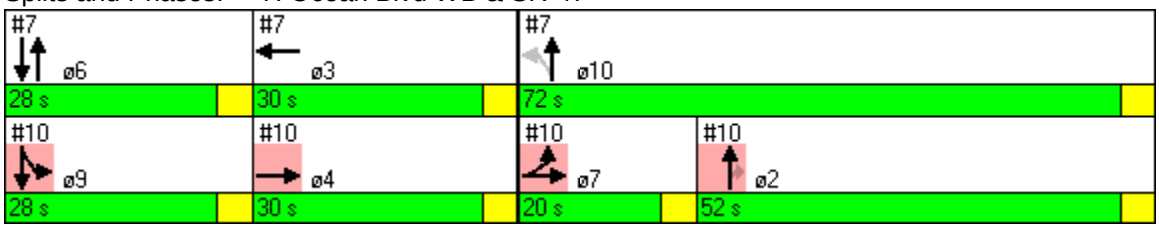
Lane Group	ø3	ø4	ø6	ø10
Lane Configurations				
Total Lost Time (s)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Volume (vph)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	3	4	6	10
Permitted Phases				
Detector Phases				
Minimum Initial (s)	8.0	8.0	8.0	8.0
Minimum Split (s)	21.5	21.5	21.5	21.5
Total Split (s)	30.5	30.5	31.0	68.5
Total Split (%)	23%	23%	24%	53%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lead/Lag	Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	
Recall Mode	None	None	Min	Min
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	0	0	0	0	3610	1615	1805	3610	0	0	3458	2842
Flt Permitted							0.582					
Satd. Flow (perm)	0	0	0	0	3610	1615	1106	3610	0	0	3458	2842
Satd. Flow (RTOR)						499						1043
Volume (vph)	0	0	0	0	171	499	73	420	0	0	264	1043
Lane Group Flow (vph)	0	0	0	0	171	499	73	420	0	0	264	1043
Turn Type						Free	custom					Free
Protected Phases					3			10 6			6	
Permitted Phases						Free	10					Free
Detector Phases					3		10	10 6			6	
Minimum Initial (s)					8.0		8.0				8.0	
Minimum Split (s)					21.5		21.5				21.5	
Total Split (s)	0.0	0.0	0.0	0.0	30.0	0.0	72.0	100.0	0.0	0.0	28.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	23.1%	0.0%	55.4%	76.9%	0.0%	0.0%	21.5%	0.0%
Yellow Time (s)					4.0		4.0				4.0	
All-Red Time (s)					0.0		0.0				0.0	
Lead/Lag					Lag						Lead	
Lead-Lag Optimize?											Yes	
Recall Mode					None		Min				Min	
Act Effct Green (s)					13.2	130.0	90.3	108.8			14.5	130.0
Actuated g/C Ratio					0.10	1.00	0.69	0.84			0.11	1.00
v/c Ratio					0.46	0.31	0.10	0.14			0.69	0.37
Control Delay					58.2	0.5	1.3	1.5			64.7	0.4
Queue Delay					0.0	0.0	1.6	0.4			0.0	0.0
Total Delay					58.2	0.5	2.9	1.9			64.7	0.4
LOS					E	A	A	A			E	A
Approach Delay					15.2			2.1			13.4	
Approach LOS					B			A			B	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 74 (57%), Referenced to phase 7:EBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 11.6	Intersection LOS: B
Intersection Capacity Utilization 36.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 7: Ocean Blvd WB & SR-47



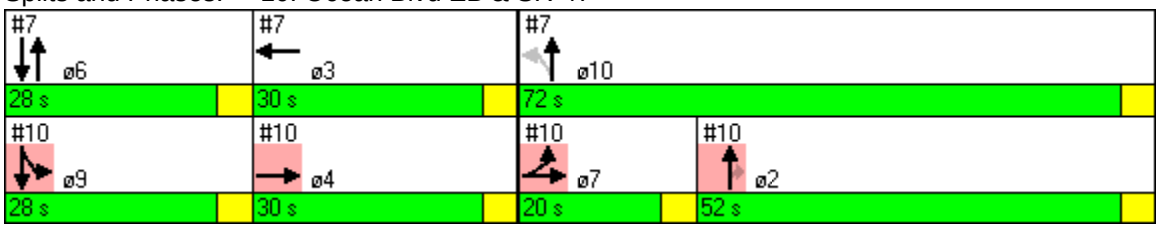
Lane Group	ø2	ø4	ø7	ø9
Lane Configurations				
Total Lost Time (s)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Volume (vph)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	2	4	7	9
Permitted Phases				
Detector Phases				
Minimum Initial (s)	8.0	8.0	6.0	8.0
Minimum Split (s)	21.5	21.5	11.5	21.5
Total Split (s)	52.0	30.0	20.0	28.0
Total Split (%)	40%	23%	15%	22%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lead/Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?				
Recall Mode	Min	None	C-Max	Min
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	3458	3476	0	0	0	0	0	5187	1615	3285	3610	0
Flt Permitted										0.950		
Satd. Flow (perm)	3458	3476	0	0	0	0	0	5187	1615	3285	3610	0
Satd. Flow (RTOR)		37							53			
Volume (vph)	0	282	91	0	0	0	0	493	53	135	131	0
Lane Group Flow (vph)	0	373	0	0	0	0	0	493	53	135	131	0
Turn Type	Prot								Perm	Split		
Protected Phases	7	4 7						2		9	9	
Permitted Phases									2			
Detector Phases	7	4 7						2	2	9	9	
Minimum Initial (s)	6.0							8.0	8.0	8.0	8.0	
Minimum Split (s)	11.5							21.5	21.5	21.5	21.5	
Total Split (s)	20.0	50.0	0.0	0.0	0.0	0.0	0.0	52.0	52.0	28.0	28.0	0.0
Total Split (%)	15.4%	38.5%	0.0%	0.0%	0.0%	0.0%	0.0%	40.0%	40.0%	21.5%	21.5%	0.0%
Yellow Time (s)	4.0							4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0							0.0	0.0	0.0	0.0	
Lead/Lag	Lead							Lag	Lag	Lead	Lead	
Lead-Lag Optimize?												
Recall Mode	C-Max							Min	Min	Min	Min	
Act Effct Green (s)		86.8						16.5	16.5	14.8	14.8	
Actuated g/C Ratio		0.67						0.13	0.13	0.11	0.11	
v/c Ratio		0.16						0.75	0.21	0.36	0.32	
Control Delay		7.2						62.1	14.4	26.4	25.8	
Queue Delay		0.0						0.0	0.0	0.1	0.1	
Total Delay		7.2						62.1	14.4	26.6	25.9	
LOS		A						E	B	C	C	
Approach Delay		7.2						57.5			26.2	
Approach LOS		A						E			C	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 74 (57%), Referenced to phase 7:EBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 34.6	Intersection LOS: C
Intersection Capacity Utilization 36.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 10: Ocean Blvd EB & SR-47



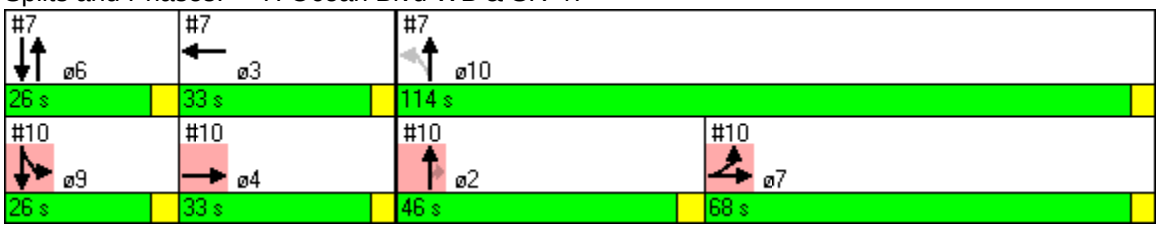
Lane Group	ø3	ø4	ø6	ø10
Lane Configurations				
Total Lost Time (s)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Volume (vph)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	3	4	6	10
Permitted Phases				
Detector Phases				
Minimum Initial (s)	8.0	8.0	8.0	8.0
Minimum Split (s)	21.5	21.5	21.5	21.5
Total Split (s)	30.0	30.0	28.0	72.0
Total Split (%)	23%	23%	22%	55%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lead/Lag	Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	
Recall Mode	None	None	Min	Min
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	0	0	0	0	3610	1615	1805	3610	0	0	3458	2842
Flt Permitted							0.609					
Satd. Flow (perm)	0	0	0	0	3610	1615	1157	3610	0	0	3458	2842
Satd. Flow (RTOR)						267						687
Volume (vph)	0	0	0	0	208	305	115	1543	0	0	220	687
Lane Group Flow (vph)	0	0	0	0	208	305	115	1543	0	0	220	687
Turn Type						Free	custom					Free
Protected Phases					3			10 6			6	
Permitted Phases						Free	10					Free
Detector Phases					3		10	10 6			6	
Minimum Initial (s)					8.0		8.0				8.0	
Minimum Split (s)					21.5		21.5				21.5	
Total Split (s)	0.0	0.0	0.0	0.0	33.0	0.0	114.0	140.0	0.0	0.0	26.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	19.1%	0.0%	65.9%	80.9%	0.0%	0.0%	15.0%	0.0%
Yellow Time (s)					4.0		4.0				4.0	
All-Red Time (s)					0.0		0.0				0.0	
Lead/Lag					Lag						Lead	
Lead-Lag Optimize?											Yes	
Recall Mode					None		Min				Min	
Act Effct Green (s)					14.9	173.0	130.2	150.1			15.9	173.0
Actuated g/C Ratio					0.09	1.00	0.75	0.87			0.09	1.00
v/c Ratio					0.67	0.19	0.13	0.49			0.69	0.24
Control Delay					87.3	0.3	0.9	1.1			87.3	0.2
Queue Delay					0.0	0.0	1.6	0.2			0.0	0.0
Total Delay					87.3	0.3	2.4	1.4			87.3	0.2
LOS					F	A	A	A			F	A
Approach Delay					35.5			1.4			21.3	
Approach LOS					D			A			C	

Intersection Summary	
Cycle Length: 173	
Actuated Cycle Length: 173	
Offset: 0 (0%), Referenced to phase 7:EBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 13.0	Intersection LOS: B
Intersection Capacity Utilization 63.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 7: Ocean Blvd WB & SR-47



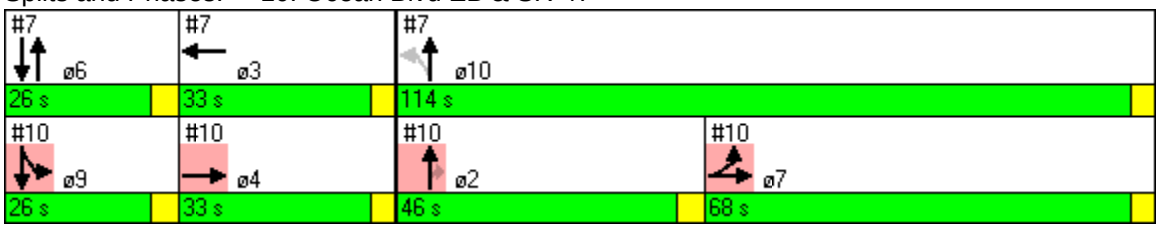
Lane Group	ø2	ø4	ø7	ø9
Lane Configurations				
Total Lost Time (s)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Volume (vph)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	2	4	7	9
Permitted Phases				
Detector Phases				
Minimum Initial (s)	8.0	8.0	6.0	8.0
Minimum Split (s)	21.5	21.5	11.5	21.5
Total Split (s)	46.0	33.0	68.0	26.0
Total Split (%)	27%	19%	39%	15%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lead/Lag	Lead	Lag	Lag	Lead
Lead-Lag Optimize?				
Recall Mode	Min	None	C-Max	Min
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	3285	3437	0	0	0	0	0	5187	1615	3285	3610	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	3285	3437	0	0	0	0	0	5187	1615	3285	3610	0
Satd. Flow (RTOR)		68							60			
Volume (vph)	1190	196	91	0	0	0	0	464	60	112	107	0
Lane Group Flow (vph)	1190	287	0	0	0	0	0	464	60	112	107	0
Turn Type	Prot								Perm	Split		
Protected Phases	7	4 7						2		9	9	
Permitted Phases									2			
Detector Phases	7	4 7						2	2	9	9	
Minimum Initial (s)	6.0							8.0	8.0	8.0	8.0	
Minimum Split (s)	11.5							21.5	21.5	21.5	21.5	
Total Split (s)	68.0	101.0	0.0	0.0	0.0	0.0	0.0	46.0	46.0	26.0	26.0	0.0
Total Split (%)	39.3%	58.4%	0.0%	0.0%	0.0%	0.0%	0.0%	26.6%	26.6%	15.0%	15.0%	0.0%
Yellow Time (s)	4.0							4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0							0.0	0.0	0.0	0.0	
Lead/Lag	Lag							Lead	Lead	Lead	Lead	
Lead-Lag Optimize?												
Recall Mode	C-Max							Min	Min	Min	Min	
Act Effct Green (s)	106.3	120.7						19.9	19.9	16.4	16.4	
Actuated g/C Ratio	0.61	0.70						0.12	0.12	0.09	0.09	
v/c Ratio	0.59	0.12						0.78	0.25	0.36	0.31	
Control Delay	23.0	3.8						83.6	16.6	21.0	20.1	
Queue Delay	4.4	0.0						0.0	0.0	0.9	0.9	
Total Delay	27.4	3.8						83.6	16.6	21.9	21.0	
LOS	C	A						F	B	C	C	
Approach Delay		22.8						75.9			21.5	
Approach LOS		C						E			C	

Intersection Summary	
Cycle Length: 173	
Actuated Cycle Length: 173	
Offset: 0 (0%), Referenced to phase 7:EBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 35.2	Intersection LOS: D
Intersection Capacity Utilization 63.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 10: Ocean Blvd EB & SR-47



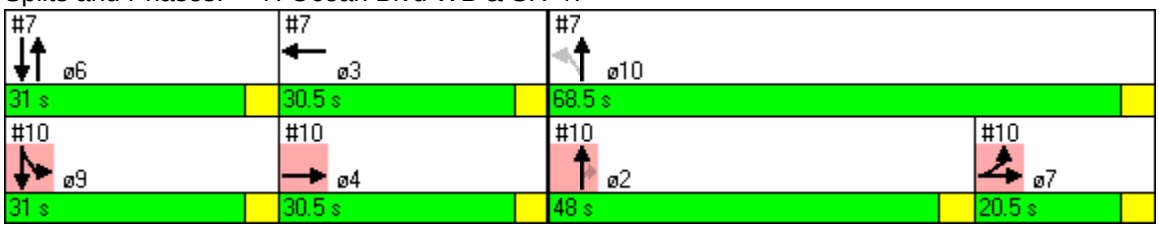
Lane Group	ø3	ø4	ø6	ø10
Lane Configurations				
Total Lost Time (s)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Volume (vph)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	3	4	6	10
Permitted Phases				
Detector Phases				
Minimum Initial (s)	8.0	8.0	8.0	8.0
Minimum Split (s)	21.5	21.5	21.5	21.5
Total Split (s)	33.0	33.0	26.0	114.0
Total Split (%)	19%	19%	15%	66%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lead/Lag	Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	
Recall Mode	None	None	Min	Min
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	0	0	0	0	3610	1615	1805	3610	0	0	3458	2842
Flt Permitted							0.428					
Satd. Flow (perm)	0	0	0	0	3610	1615	813	3610	0	0	3458	2842
Satd. Flow (RTOR)						454						1016
Volume (vph)	0	0	0	0	80	846	93	808	0	0	567	1272
Lane Group Flow (vph)	0	0	0	0	80	846	93	808	0	0	567	1272
Turn Type						Free	custom					Free
Protected Phases					3			10 6			6	
Permitted Phases						Free	10					Free
Detector Phases					3		10	10 6			6	
Minimum Initial (s)					8.0		8.0				8.0	
Minimum Split (s)					21.5		21.5				21.5	
Total Split (s)	0.0	0.0	0.0	0.0	30.5	0.0	68.5	99.5	0.0	0.0	31.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	23.5%	0.0%	52.7%	76.5%	0.0%	0.0%	23.8%	0.0%
Yellow Time (s)					4.0		4.0				4.0	
All-Red Time (s)					0.0		0.0				0.0	
Lead/Lag					Lag						Lead	
Lead-Lag Optimize?											Yes	
Recall Mode					None		Min				Min	
Act Effct Green (s)					9.5	130.0	82.4	115.7			28.5	130.0
Actuated g/C Ratio					0.07	1.00	0.63	0.89			0.22	1.00
v/c Ratio					0.30	0.52	0.18	0.25			0.75	0.45
Control Delay					60.3	1.2	0.1	3.2			55.2	0.5
Queue Delay					0.0	0.0	2.9	1.7			0.0	0.0
Total Delay					60.3	1.2	2.9	4.9			55.2	0.5
LOS					E	A	A	A			E	A
Approach Delay					6.3			4.7			17.4	
Approach LOS					A			A			B	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 44 (34%), Referenced to phase 7:EBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 11.5	Intersection LOS: B
Intersection Capacity Utilization 45.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 7: Ocean Blvd WB & SR-47



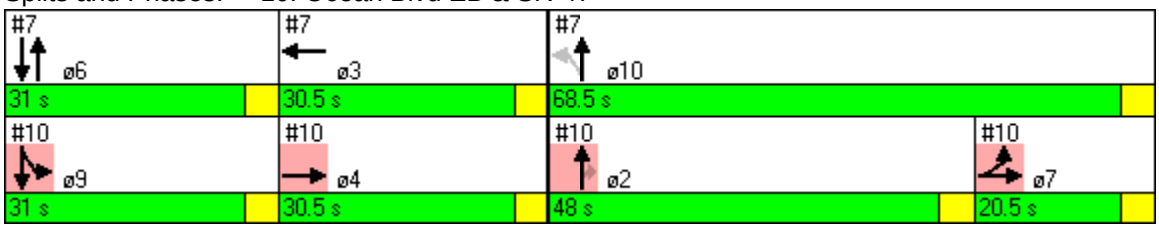
Lane Group	ø2	ø4	ø7	ø9
Lane Configurations				
Total Lost Time (s)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Volume (vph)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	2	4	7	9
Permitted Phases				
Detector Phases				
Minimum Initial (s)	8.0	8.0	6.0	8.0
Minimum Split (s)	21.5	21.5	11.5	21.5
Total Split (s)	48.0	30.5	20.5	31.0
Total Split (%)	37%	23%	16%	24%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lead/Lag	Lead	Lag	Lag	Lead
Lead-Lag Optimize?				
Recall Mode	Min	None	C-Max	Min
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	3458	3422	0	0	0	0	0	5187	1615	3285	3610	0
Flt Permitted										0.950		
Satd. Flow (perm)	3458	3422	0	0	0	0	0	5187	1615	3285	3610	0
Satd. Flow (RTOR)		81							97			
Volume (vph)	0	232	124	0	0	0	0	900	97	277	290	0
Lane Group Flow (vph)	0	356	0	0	0	0	0	900	97	277	290	0
Turn Type	Prot								Perm	Split		
Protected Phases	7	4 7						2		9	9	
Permitted Phases									2			
Detector Phases	7	4 7						2	2	9	9	
Minimum Initial (s)	6.0							8.0	8.0	8.0	8.0	
Minimum Split (s)	11.5							21.5	21.5	21.5	21.5	
Total Split (s)	20.5	51.0	0.0	0.0	0.0	0.0	0.0	48.0	48.0	31.0	31.0	0.0
Total Split (%)	15.8%	39.2%	0.0%	0.0%	0.0%	0.0%	0.0%	36.9%	36.9%	23.8%	23.8%	0.0%
Yellow Time (s)	4.0							4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0							0.0	0.0	0.0	0.0	
Lead/Lag	Lag							Lead	Lead	Lead	Lead	
Lead-Lag Optimize?												
Recall Mode	C-Max							Min	Min	Min	Min	
Act Effct Green (s)		58.7						28.3	28.3	27.0	27.0	
Actuated g/C Ratio		0.45						0.22	0.22	0.21	0.21	
v/c Ratio		0.22						0.80	0.23	0.41	0.39	
Control Delay		4.7						53.6	8.3	7.4	7.2	
Queue Delay		0.0						0.1	0.0	1.5	1.5	
Total Delay		4.7						53.7	8.3	8.9	8.7	
LOS		A						D	A	A	A	
Approach Delay		4.7						49.3			8.8	
Approach LOS		A						D			A	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 44 (34%), Referenced to phase 7:EBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 29.1	Intersection LOS: C
Intersection Capacity Utilization 45.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 10: Ocean Blvd EB & SR-47



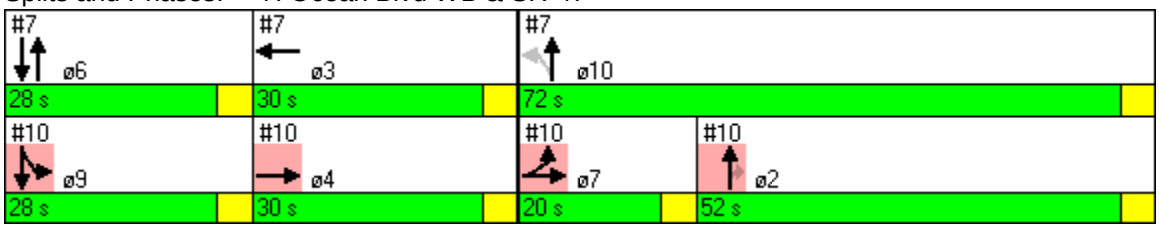
Lane Group	ø3	ø4	ø6	ø10
Lane Configurations				
Total Lost Time (s)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Volume (vph)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	3	4	6	10
Permitted Phases				
Detector Phases				
Minimum Initial (s)	8.0	8.0	8.0	8.0
Minimum Split (s)	21.5	21.5	21.5	21.5
Total Split (s)	30.5	30.5	31.0	68.5
Total Split (%)	23%	23%	24%	53%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lead/Lag	Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	
Recall Mode	None	None	Min	Min
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	0	0	0	0	3610	1615	1805	3610	0	0	3458	2842
Flt Permitted							0.462					
Satd. Flow (perm)	0	0	0	0	3610	1615	878	3610	0	0	3458	2842
Satd. Flow (RTOR)						459						1091
Volume (vph)	0	0	0	0	95	671	91	789	0	0	494	1186
Lane Group Flow (vph)	0	0	0	0	95	671	91	789	0	0	494	1186
Turn Type						Free	custom					Free
Protected Phases					3			10 6			6	
Permitted Phases						Free	10					Free
Detector Phases					3		10	10 6			6	
Minimum Initial (s)					8.0		8.0				8.0	
Minimum Split (s)					21.5		21.5				21.5	
Total Split (s)	0.0	0.0	0.0	0.0	30.0	0.0	72.0	100.0	0.0	0.0	28.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	23.1%	0.0%	55.4%	76.9%	0.0%	0.0%	21.5%	0.0%
Yellow Time (s)					4.0		4.0				4.0	
All-Red Time (s)					0.0		0.0				0.0	
Lead/Lag					Lag						Lead	
Lead-Lag Optimize?											Yes	
Recall Mode					None		Min				Min	
Act Effct Green (s)					16.0	130.0	78.1	106.0			23.9	130.0
Actuated g/C Ratio					0.12	1.00	0.60	0.82			0.18	1.00
v/c Ratio					0.21	0.42	0.17	0.27			0.78	0.42
Control Delay					52.1	0.8	1.5	3.2			58.9	0.5
Queue Delay					0.0	0.0	1.4	1.6			0.0	0.0
Total Delay					52.1	0.8	2.9	4.7			58.9	0.5
LOS					D	A	A	A			E	A
Approach Delay					7.2			4.6			17.6	
Approach LOS					A			A			B	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 74 (57%), Referenced to phase 7:EBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 11.8	Intersection LOS: B
Intersection Capacity Utilization 45.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 7: Ocean Blvd WB & SR-47



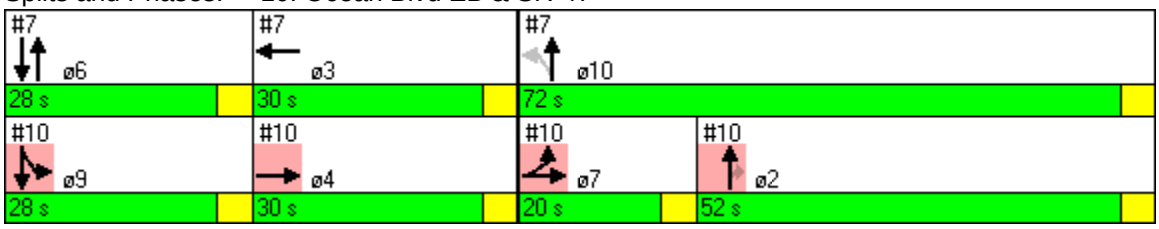
Lane Group	ø2	ø4	ø7	ø9
Lane Configurations				
Total Lost Time (s)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Volume (vph)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	2	4	7	9
Permitted Phases				
Detector Phases				
Minimum Initial (s)	8.0	8.0	6.0	8.0
Minimum Split (s)	21.5	21.5	11.5	21.5
Total Split (s)	52.0	30.0	20.0	28.0
Total Split (%)	40%	23%	15%	22%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lead/Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?				
Recall Mode	Min	None	C-Max	Min
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	3458	3448	0	0	0	0	0	5187	1615	3285	3610	0
Flt Permitted										0.950		
Satd. Flow (perm)	3458	3448	0	0	0	0	0	5187	1615	3285	3610	0
Satd. Flow (RTOR)		57							108			
Volume (vph)	0	289	124	0	0	0	0	880	108	229	265	0
Lane Group Flow (vph)	0	413	0	0	0	0	0	880	108	229	265	0
Turn Type	Prot								Perm	Split		
Protected Phases	7	4 7						2		9	9	
Permitted Phases									2			
Detector Phases	7	4 7						2	2	9	9	
Minimum Initial (s)	6.0							8.0	8.0	8.0	8.0	
Minimum Split (s)	11.5							21.5	21.5	21.5	21.5	
Total Split (s)	20.0	50.0	0.0	0.0	0.0	0.0	0.0	52.0	52.0	28.0	28.0	0.0
Total Split (%)	15.4%	38.5%	0.0%	0.0%	0.0%	0.0%	0.0%	40.0%	40.0%	21.5%	21.5%	0.0%
Yellow Time (s)	4.0							4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0							0.0	0.0	0.0	0.0	
Lead/Lag	Lead							Lag	Lag	Lead	Lead	
Lead-Lag Optimize?												
Recall Mode	C-Max							Min	Min	Min	Min	
Act Effct Green (s)		61.1						27.5	27.5	29.5	29.5	
Actuated g/C Ratio		0.47						0.21	0.21	0.23	0.23	
v/c Ratio		0.25						0.80	0.25	0.31	0.32	
Control Delay		12.4						54.5	8.4	1.1	1.0	
Queue Delay		0.0						0.1	0.0	1.3	1.3	
Total Delay		12.4						54.6	8.4	2.3	2.3	
LOS		B						D	A	A	A	
Approach Delay		12.4						49.5			2.3	
Approach LOS		B						D			A	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 74 (57%), Referenced to phase 7:EBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 29.1	Intersection LOS: C
Intersection Capacity Utilization 45.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 10: Ocean Blvd EB & SR-47



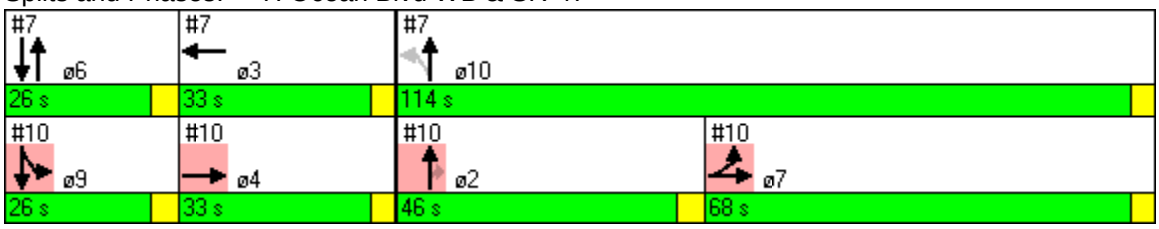
Lane Group	ø3	ø4	ø6	ø10
Lane Configurations				
Total Lost Time (s)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Volume (vph)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	3	4	6	10
Permitted Phases				
Detector Phases				
Minimum Initial (s)	8.0	8.0	8.0	8.0
Minimum Split (s)	21.5	21.5	21.5	21.5
Total Split (s)	30.0	30.0	28.0	72.0
Total Split (%)	23%	23%	22%	55%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lead/Lag	Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	
Recall Mode	None	None	Min	Min
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	0	0	0	0	3610	1615	1805	3610	0	0	3458	2842
Flt Permitted							0.490					
Satd. Flow (perm)	0	0	0	0	3610	1615	931	3610	0	0	3458	2842
Satd. Flow (RTOR)						227						691
Volume (vph)	0	0	0	0	159	557	141	2066	0	0	435	882
Lane Group Flow (vph)	0	0	0	0	159	557	141	2066	0	0	435	882
Turn Type						Free	custom					Free
Protected Phases					3			10 6			6	
Permitted Phases						Free	10					Free
Detector Phases					3		10	10 6			6	
Minimum Initial (s)					8.0		8.0				8.0	
Minimum Split (s)					21.5		21.5				21.5	
Total Split (s)	0.0	0.0	0.0	0.0	33.0	0.0	114.0	140.0	0.0	0.0	26.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	19.1%	0.0%	65.9%	80.9%	0.0%	0.0%	15.0%	0.0%
Yellow Time (s)					4.0		4.0				4.0	
All-Red Time (s)					0.0		0.0				0.0	
Lead/Lag					Lag						Lead	
Lead-Lag Optimize?											Yes	
Recall Mode					None		Min				Min	
Act Effct Green (s)					12.6	173.0	126.4	152.4			22.0	173.0
Actuated g/C Ratio					0.07	1.00	0.73	0.88			0.13	1.00
v/c Ratio					0.60	0.34	0.21	0.65			0.99	0.31
Control Delay					87.3	0.6	1.2	2.7			113.8	0.3
Queue Delay					0.0	0.0	3.1	1.2			0.0	0.0
Total Delay					87.3	0.6	4.3	3.9			113.8	0.3
LOS					F	A	A	A			F	A
Approach Delay					19.8			4.0			37.8	
Approach LOS					B			A			D	

Intersection Summary	
Cycle Length: 173	
Actuated Cycle Length: 173	
Offset: 0 (0%), Referenced to phase 7:EBTL, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 17.1	Intersection LOS: B
Intersection Capacity Utilization 80.7%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 7: Ocean Blvd WB & SR-47



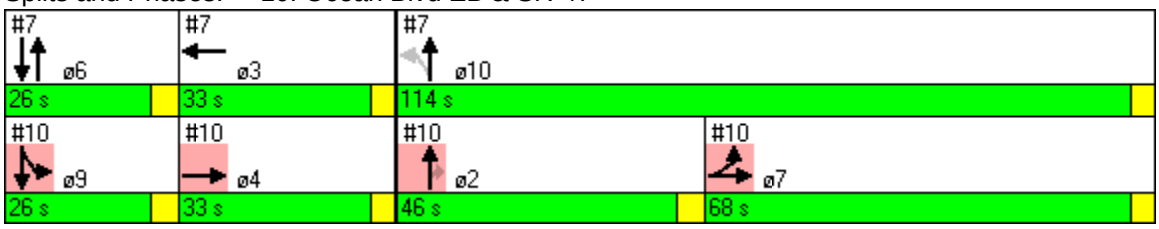
Lane Group	ø2	ø4	ø7	ø9
Lane Configurations				
Total Lost Time (s)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Volume (vph)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	2	4	7	9
Permitted Phases				
Detector Phases				
Minimum Initial (s)	8.0	8.0	6.0	8.0
Minimum Split (s)	21.5	21.5	11.5	21.5
Total Split (s)	46.0	33.0	68.0	26.0
Total Split (%)	27%	19%	39%	15%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lead/Lag	Lead	Lag	Lag	Lead
Lead-Lag Optimize?				
Recall Mode	Min	None	C-Max	Min
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	3285	3426	0	0	0	0	0	5187	1615	3285	3610	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	3285	3426	0	0	0	0	0	5187	1615	3285	3610	0
Satd. Flow (RTOR)		84							45			
Volume (vph)	1301	240	125	0	0	0	0	908	50	218	217	0
Lane Group Flow (vph)	1301	365	0	0	0	0	0	908	50	218	217	0
Turn Type	Prot								Perm	Split		
Protected Phases	7	4 7						2		9	9	
Permitted Phases									2			
Detector Phases	7	4 7						2	2	9	9	
Minimum Initial (s)	6.0							8.0	8.0	8.0	8.0	
Minimum Split (s)	11.5							21.5	21.5	21.5	21.5	
Total Split (s)	68.0	101.0	0.0	0.0	0.0	0.0	0.0	46.0	46.0	26.0	26.0	0.0
Total Split (%)	39.3%	58.4%	0.0%	0.0%	0.0%	0.0%	0.0%	26.6%	26.6%	15.0%	15.0%	0.0%
Yellow Time (s)	4.0							4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0							0.0	0.0	0.0	0.0	
Lead/Lag	Lag							Lead	Lead	Lead	Lead	
Lead-Lag Optimize?												
Recall Mode	C-Max							Min	Min	Min	Min	
Act Effct Green (s)	85.8	98.4						36.6	36.6	22.0	22.0	
Actuated g/C Ratio	0.50	0.57						0.21	0.21	0.13	0.13	
v/c Ratio	0.80	0.18						0.83	0.13	0.52	0.47	
Control Delay	42.0	7.6						72.0	15.6	19.8	19.5	
Queue Delay	60.7	0.0						1.3	0.0	4.4	4.2	
Total Delay	102.8	7.6						73.3	15.6	24.3	23.8	
LOS	F	A						E	B	C	C	
Approach Delay		81.9						70.3			24.0	
Approach LOS		F						E			C	

Intersection Summary	
Cycle Length: 173	
Actuated Cycle Length: 173	
Offset: 0 (0%), Referenced to phase 7:EBTL, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 70.0	Intersection LOS: E
Intersection Capacity Utilization 80.7%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 10: Ocean Blvd EB & SR-47



Lane Group	ø3	ø4	ø6	ø10
Lane Configurations				
Total Lost Time (s)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Volume (vph)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	3	4	6	10
Permitted Phases				
Detector Phases				
Minimum Initial (s)	8.0	8.0	8.0	8.0
Minimum Split (s)	21.5	21.5	21.5	21.5
Total Split (s)	33.0	33.0	26.0	114.0
Total Split (%)	19%	19%	15%	66%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lead/Lag	Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	
Recall Mode	None	None	Min	Min
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				

Intersection Summary

Appendix M
$PM_{2.5}$ Hot Spot Analysis

Appendix M
$PM_{2.5}$ Hot-spot Project-Level Conformity Determination

for the

Schuyler Heim Bridge Replacement and SR-47 Expressway Project

This document is a revision to the $PM_{2.5}$ Hotspot Analysis submitted in October 2006 to incorporate the project scope changes of the newly added Schuyler Heim Bridge auxiliary lanes and the flyover. The original $PM_{2.5}$ hot-spot analysis was approved by the SCAG Transportation Conformity Work Group (TCWG) at the October 2006 meeting.

This document provides the qualitative $PM_{2.5}$ hot-spot analysis required to demonstrate project-level conformity. The proposed action would be considered as a project of air quality concern based on the criteria listed in the Final Conformity Rule (40 CFR 93.123 (b)(1)). Therefore, the following qualitative project-level hot-spot assessment was conducted to assess whether the project would cause or contribute to any new localized $PM_{2.5}$ violations, or increase the frequency or severity of any existing violations, or delay timely attainment of the $PM_{2.5}$ national ambient air quality standards (NAAQS). This project is identified as a Transportation Control Measure (TCM) project in the RTP and RTIP; its timely implementation is a crucial element in the reduction of air pollutant emissions from roadway transportation sources.

Regulatory Background

On March 10, 2006, EPA issued amendments to the Transportation Conformity Rule to address localized impacts of particulate matter: "*$PM_{2.5}$ and PM_{10} Hot-Spot Analyses in Project-level Transportation Conformity Determinations for the New $PM_{2.5}$ and Existing PM_{10} National Ambient Air Quality Standards*" (71 FR 12468). This amendment requires the assessment of localized air quality impacts in PM_{10} and $PM_{2.5}$ nonattainment and maintenance areas for federally-funded or approved transportation projects of air quality concern. This assessment of localized impacts (i.e., "hot-spot analysis") examines potential air quality impacts on a scale smaller than an entire nonattainment or maintenance area. Such an analysis is a means of demonstrating that a transportation project meets Clean Air Act (CAA) conformity requirements to support state and local air quality goals. Since the proposed action is located in a federal nonattainment area for $PM_{2.5}$, localized impacts must be assessed.

The EPA specified in 40 CFR 93.123(b)(1) of the Final Conformity Rule that projects of air quality concern are certain highway and transit projects that involve significant levels of diesel vehicle traffic, or any other project that is identified in the $PM_{2.5}$ State Implementation Plan (SIP) as a localized air quality concern. According to 40 CFR 93.123(b)(2) and (4), a quantitative analysis for applicable projects is not required until EPA releases modeling guidance in the Federal Register. However, a qualitative hot-spot analysis is required for projects of air quality concern. This qualitative analysis of localized $PM_{2.5}$ impacts was prepared because the proposed action has the potential to be a project of air quality concern.

This qualitative analysis was based on directly emitted emissions including tailpipe, break wear, and tire wear, because the direct emissions could potentially cause nearby hot-spots, or localized areas of elevated concentration. Re-entrained road dust was also included in the analysis. The emission inventories presented in the SCAQMD 2007 AQMP show that emissions from paved roads are the single largest contributor to the directly emitted $PM_{2.5}$ emissions. Construction-related $PM_{2.5}$ emissions were not included in this hot-spot analysis because these emissions would be considered temporary since construction would last less than 5 years (40 CFR 93.123(c)(5)). Secondary $PM_{2.5}$ would be associated with regional impacts and therefore are not included in a hot-spot analysis.

Project Description

The Federal Highway Administration (FHWA) and California Department of Transportation (Caltrans) are proposing to replace the existing Commodore Schuyler F. Heim Bridge (Schuyler Heim Bridge) to meet current seismic criteria. Concurrently, the Alameda Corridor Transportation Authority (ACTA) proposes to construct an expressway along State Route (SR-) 47 or SR-103 to provide a high-capacity alternative route for traffic between Terminal Island and Interstate (I-) 405. In addition, a two-lane, elevated flyover structure to divert traffic bound for northbound SR-47 directly onto the new bridge from eastbound Ocean Boulevard is proposed. The Schuyler Heim Bridge is located within the City and Port of Long Beach, and Terminal Island is co-located within the Port of Long Beach and Port of Los Angeles. The project is scheduled to be open for traffic in 2011 and the flyover would be complete in 2015.

The proposed action is to improve traffic conditions between Terminal Island and major traffic arterials on the mainland to the north, primarily within the cities of Long Beach and Los Angeles. This project is identified as a Transportation Control Measure (TCM) project in the RTP and RTIP; its timely implementation is a crucial element in the reduction of air pollutant emissions from roadway transportation sources. Six alternatives have been proposed for analysis in an Environmental Impact Statement/ Environmental Impact Report (EIS/EIR) to address the proposed action. There are four build alternatives, one transportation system management (TSM) alternative, and one no build alternative. According to the Transportation Conformity Rule (40 CFR 93.123(b)(1) (i)), this project would be classified as a new or expanded highway project that has a significant number of or significant increase in diesel vehicles. The project alternatives are described in the following sections.

Alternative 1: Bridge Replacement and Expressway

This alternative would replace the existing Schuyler Heim Bridge to meet current seismic criteria and provide an elevated through-lane (Ocean Boulevard/SR-47 flyover) from eastbound Ocean Boulevard onto northbound SR-47. This alternative also includes construction of a new SR-47 expressway to provide a high-capacity alternative route along the Alameda Corridor for traffic between Terminal Island and Alameda Street, south of Pacific Coast Highway. The Schuyler Heim Bridge is a major traffic route and connects Terminal Island within the Ports of Long Beach and Los Angeles to the mainland cities of Long Beach and Los Angeles. The bridge is located within the City of Los Angeles and through property owned by the Port of Long Beach.

With this alternative, a new fixed-span bridge would be constructed primarily within the existing bridge right-of-way (ROW) (Caltrans Highway Easement [HE(C)]), but toward the east to avoid impacts to the railroad on the Badger Avenue Bridge immediately to the west. The existing Schuyler Heim Bridge (a lift bridge) would be demolished. The replacement bridge would be slightly wider (13 meters [m] [43 feet (ft)]) than the existing bridge due to the addition of standard shoulders, which are not present on the existing bridge. The replacement bridge would include three 3.6-m (12-ft) lanes and 3-m (10-ft) shoulders in the northbound direction, and three 3.6-m (12-ft) lanes, one 3.6-m (12-ft) auxiliary lane, and 3-m (10-ft) shoulders in the southbound direction. Bridge construction would include a southbound off-ramp and northbound on-ramp at New Dock Street on Terminal Island, as well as a northbound off-ramp and southbound on-ramp at Henry Ford Avenue on the mainland side of the bridge. With this alternative, the new bridge would be supported by four piers in the channel, with a minimum vertical clearance of 14.3 m (47 ft) over the mean high water level (MHWL). This clearance would be maintained for the width of the navigable channel, which would be 54.9 m (180 ft).

The Ocean Boulevard/SR-47 flyover will be a two-lane, elevated structure to divert traffic bound for northbound SR-47 directly onto the new bridge from eastbound Ocean Boulevard. The purpose of the flyover is to enable this traffic to avoid the signalized Ocean Boulevard/ SR-47 intersection. Under Alternative 1, the flyover will begin on Terminal Island, about 1,200 m (3,900 ft) west of the Ocean Boulevard/SR-47 intersection, extend eastward along the south side of Ocean Boulevard, then turn north, cross over Ocean Boulevard and onto the new bridge. The west end of the flyover will be at grade, then rise to a maximum elevation of 21 m (69 ft) to cross over Ocean Boulevard, then descend to an elevation of 12.9 m (42.4 ft) to join the new bridge. The elevated portions of the flyover will be supported by eight single-column bents and two 2-column outrigger bents. Each column is approximately 2.4 m (8 ft) in diameter. The structure will consist of 11 spans, with lengths that range between 57 m (186 ft) and 73 m (240 ft). The flyover will have an overall length of 1,550 m (5,084 ft), ending at the northerly end point (gore point) of the northbound New Dock Street on-ramp onto the bridge. The left lane of the flyover will converge with the SR-47 through-lane to the left; the right lane of the flyover will continue as a northbound SR-47 through-lane and will have the option to continue to SR-47 or SR-103. The flyover will be located entirely within the City and Port of Long Beach.

The new SR-47 Expressway would begin on Terminal Island, at the intersection of SR-47 and Ocean Boulevard, extending north over New Dock Street and onto the Schuyler Heim Bridge replacement. A new northbound on-ramp would be constructed from New Dock

Street, and a new southbound off-ramp would be constructed to New Dock Street, as described above. The expressway would extend northward to Alameda Street, south of the intersection with Pacific Coast Highway, a distance of approximately 2.7 kilometers (km) (1.5 miles [mi]). The expressway would be a four-lane, limited access roadway. It would grade-separate five at-grade railroad crossings and three signalized intersections along its length. A segment of the expressway would be constructed as an elevated viaduct over Henry Ford Avenue and Alameda Street and return to grade at Alameda Street, just south of Pacific Coast Highway. Under this alternative, connectivity to SR-103 would be maintained. This alternative includes improvements to the Alameda Street/Wardlow Road connector and to Alameda Street north and south of the connector.

Alternative 1A: Haunch Bridge Design

Alternative 1A is a structural variation of Alternative 1. The main purpose of this alternative is to improve the aesthetics of the replacement bridge over the Cerritos Channel and span a greater horizontal distance across the channel between columns. This is accomplished by increasing the span lengths over the channel and arching the superstructure soffits (the bottom of the bridge structure). Under this alternative, the new bridge would be supported by two piers (four columns) in the Cerritos Channel, compared to four piers (eight columns) under Alternative 1; and the minimum vertical clearance between the piers would be of 14.3 m (47 feet). This clearance would be maintained for the width of the navigable channel, which would be 54.9 m (180 feet).

Other aspects of this alternative, including the flyover, would be the same as Alternative 1.

Alternative 2: SR-103 Extension to Alameda Street

With this alternative, the existing Schuyler Heim Bridge would be demolished and a new fixed-span bridge and flyover would be constructed, as described under Alternative 1. With this alternative, the right lane of the flyover would continue to SR-103 after crossing the new bridge. Additionally, modifications to the northbound and southbound approaches to the bridge would be constructed.

This alternative also would extend SR-103 to the northwest on a four-lane elevated viaduct to join Alameda Street between Sepulveda Boulevard and I-405. Improvements to SR-103 would begin approximately 3.2 km (2 mi) north of the Schuyler Heim Bridge and extend a distance of approximately 2.6 km (1.6 mi). The elevated viaduct would cross over the Union Pacific Railroad manual yard and San Pedro Branch, through the Southern California Edison (SCE) utility corridor, across the Los Angeles Harbor Department Warehouse 16/17 area, over Sepulveda Boulevard, then parallel the western boundary of the Intermodal Container Transfer Facility (ICTF) to the centerline of Alameda Street. The viaduct would slope to grade south of the Wardlow Road ramps to I-405. Improvements would be made to the existing SR-103 to accommodate the southerly end connection of the viaduct and to SR-47 to accommodate the northerly end connection of the viaduct. This alternative also includes widening the Alameda Street/Wardlow Road connector and improvements to Alameda Street north and south of the connector.

Alternative 3: Bridge Avoidance

This alternative would preserve the existing Schuyler Heim Bridge and construct a new fixed-span bridge on an alignment east of the existing bridge, and construct the flyover as described for Alternative 1. Under this alternative, the new bridge would have the same lane configuration as the replacement bridge for Alternative 1.

This alternative includes seismic retrofit of the existing Schuyler Heim Bridge, which would remain standing but unused. The retrofit would be for safety purposes, to avoid demolition of a historic resource, and ensure that the existing bridge would not collapse and result in safety hazards or damage to the new bridge or to the adjacent Badger Avenue Bridge. However, according to the U.S. Coast Guard, when a bridge is no longer used for its permitted purpose of providing land transportation, the bridge shall be removed from the waterway. Therefore, removal of the existing Schuyler Heim Bridge would be included as a condition of the federal permit for the replacement bridge.

With this alternative, a new SR-47 Expressway would be constructed north of the new fixed-span bridge, as described under Alternative 1, and connectivity with SR-103 would be maintained. Improvements to Alameda Street and the Wardlow Road connector would be the same as described under Alternative 1.

Alternative 4: Bridge Replacement Only

This alternative would replace the existing Schuyler Heim Bridge (lift bridge) with a fixed-span bridge largely along the existing bridge alignment, and the existing Schuyler Heim Bridge would be demolished, as would occur under Alternative 1.

With this alternative, no roadway improvements would occur. With this alternative, therefore, the SR-47 Expressway described in Alternative 1 would not be constructed; and the SR-103 extension to Alameda Street described in Alternative 2 would not be constructed. This alternative also does not include the flyover.

Alternative 5: Transportation System Management

This alternative is designed to identify low-cost, easily implementable improvements as an alternative to construction of more expensive improvements. For this project, the TSM alternative focuses on improvements to routes that parallel the proposed SR-47 Expressway, and that serve the same trips. These trips include trucking drayage trips to and from the ICTF, and trips destined to and from the Ports via Alameda Street, Henry Ford Avenue, and SR-47. The TSM alternative would include measures to improve capacity and traffic circulation at the Port of Long Beach and Port of Los Angeles through policy changes and use of the latest technologies. With this alternative, capital investment would be minimal compared to the previous alternatives addressed.

The TSM alternative for this project includes the following key elements:

- Intelligent Transportation Systems (ITS): These would be systems applications in and around the Port area, with special emphasis on truck movements. These include measures to improve traffic circulation through traffic control, incident management, traffic surveillance, and traffic information dissemination with the aid of ITS devices and systems.

- Lower-cost roadway and intersection improvements: Measures include restriping to provide additional turn lanes and acceleration lanes and traffic signalization improvements, primarily within existing ROWs.
- Minor roadway widening: There also could be peak-hour parking prohibitions to remove midblock bottlenecks along selected roadways.

This alternative would not result in the increased ability of the Schuyler Heim Bridge to withstand a major earthquake. In the event of a major earthquake that would render the Schuyler Heim Bridge unusable, there are only two other access routes to and from Terminal Island. In the event the Schuyler Heim Bridge would become unusable, a TSM alternative would not be effective in reducing roadway demand or in redirecting Terminal Island traffic to other routes.

This alternative would not result in physical improvement to or replacement of the Schuyler Heim Bridge. Therefore, this alternative: (1) would not provide a link from the mainland to Terminal Island that would ensure ground and vessel transportation immediately following a major earthquake, (2) would not provide for safety improvements for bridge traffic, (3) would not improve operational or design features of the bridge, and (4) would not minimize future maintenance and operational costs of the Schuyler Heim Bridge.

Alternative 6: No Build Alternative

Under this alternative, there would be changes to the existing Schuyler Heim Bridge or local roadway system. The existing Schuyler Heim Bridge would continue to be seismically inadequate and subject to damage or collapse under strong seismic conditions. Maintenance activities would continue and would include application of protective coatings; lift mechanism repairs; deck resurfacing; and other, similar, maintenance activities. The bridge is expected to continue to deteriorate over time as its structure is eroded further and as various magnitude earthquakes are experienced. At some point in the future, the bridge may need to be demolished and replaced solely to avoid safety hazards.

Hot-Spot Analysis Methodology

The qualitative hot-spot analysis was performed following the *Transportation Conformity Guidance for Qualitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* (EPA, March 2006) [PM Guide]. The proposed action is located in Los Angeles County, which is designated as nonattainment for the federal $PM_{2.5}$ standard and is required to attain and maintain the NAAQS. The current $PM_{2.5}$ 24-hour standard (35 $\mu g/m^3$) became effective on December 17, 2006. However, the nonattainment designations for $PM_{2.5}$ are based on the previous 24-hour standard of 65 $\mu g/m^3$. Therefore, $PM_{2.5}$ conformity for the proposed action is based on the 24-hour standard of 65 $\mu g/m^3$ and annual standard of 15 $\mu g/m^3$.

Based on the project types listed in the PM Guide, the proposed action would be categorized as a new or expanded highway project that would have a significant number of diesel vehicles, and would be affecting intersections that are at Level of Service (LOS) D, E, or F with a significant number of diesel vehicles. The proposed action would be considered a project of air quality concern based on the criteria listed in the Final Conformity Rule (40 CFR 93.123 (b)(1)). Therefore, a qualitative project-level hot-spot assessment was

conducted to assess whether the project will cause or contribute to any new localized $PM_{2.5}$ violations, or increase the frequency or severity of any existing violations, or delay timely attainment of the $PM_{2.5}$ NAAQS.

This analysis was based on directly emitted emissions including tailpipe, break wear, and tire wear, because the direct emissions could potentially cause nearby hot-spots or localized areas of elevated concentration. Re-entrained road dust was also included in the analysis. The emission inventories presented in the SCAQMD 2007 AQMP show that emissions from paved roads are the single largest contributor to the directly emitted $PM_{2.5}$ emissions. Construction-related $PM_{2.5}$ emissions were not included in this hot-spot analysis because these emissions would be considered temporary since construction would last less than 5 years (40 CFR 93.123(c)(5)). Secondary $PM_{2.5}$ would be associated with regional impacts and therefore are not included in a hot-spot analysis.

Existing Air Quality

The closest monitoring station to the project area is the North Long Beach Monitoring Station (approximately 5 miles northeast of Schuyler Heim Bridge) and provides ambient air quality data representative of local conditions. As shown in Table 1, the maximum 24-hour $PM_{2.5}$ concentration measured at the North Long Beach station during the years of 2001 to 2006, inclusive, was 115.2 $\mu g/m^3$ in 2003. The maximum annual concentration (arithmetic mean) for the same time period was 21.2 $\mu g/m^3$ in 2001. The annual average $PM_{2.5}$ NAAQS was exceeded in 5 of the 6 years, and the 24-hour average $PM_{2.5}$ NAAQS was exceeded in 3 of the 6 years. However, the $PM_{2.5}$ concentrations in the Long Beach area have been declining over the last 6 years, with a 33percent decrease of the annual concentrations.

TABLE 1
Monitoring Data from North Long Beach Station

Averaging Time	Standard (NAAQS)	$PM_{2.5}$ Concentration ($\mu g/m^3$)					
		2001	2002	2003	2004	2005	2006
Highest 24-hour	65 [a]	72.9	62.7	115.2	66.6	53.8	58.5
Exceedances of the 24-hour Standard[b]		1	0	3	1	0	0
Annual Average	15	21.2	19.5	18	17.9	15.9	14.1

Source: CARB, 2008, www.arb.ca.gov/adam/welcome
Note:
a. Although the current federal 24-hour $PM_{2.5}$ standard is 35 $\mu g/m^3$, conformity determinations are based on the 65 $\mu g/m^3$ because the $PM_{2.5}$ nonattainment designation is based on the old standard.
b. The $PM_{2.5}$ exceedances were based on the old 24-hour standard of 65 $\mu g/m^3$.

The following discussion demonstrates that $PM_{2.5}$ concentrations at the North Long Beach monitoring station are representative of the project area. The traffic data near the North Long Beach monitoring station and the Long Beach-East Pacific Coast Highway monitoring station were reviewed to evaluate the relationship between traffic conditions and monitoring data. The Long Beach-East Pacific Coast Highway station was selected for comparison since it is located closer to the project area than the North Long Beach station.

However, because the Long Beach-East Pacific Coast Highway station has only been operating since 2003, data from this station were not used in the hotspot analysis.

The annual average daily traffic (AADT) and truck percentages near the North Long Beach monitoring station were reviewed. The North Long Beach station is located approximately 0.5 mile north of I-405 and one mile east of the I-405/I-710 junction. For the year 2006, the AADT at the I-405/I-710 junction was 290,000 (Caltrans, 2008). In addition, the truck AADT (3, 4, and 5 axle trucks) was 8,606, or 3 percent of the total AADT (Caltrans, 2008). For comparison, the Long Beach-East Pacific Coast Highway monitoring station is located approximately 1 mile east of the Pacific Coast Highway (PCH)/I-710 junction. For the year 2006, the AADT at the PCH/I-710 junction was 48,000 (Caltrans, 2008). In addition, the truck AADT (3, 4, and 5 axle trucks) was 7,081, or 15 percent of the total AADT (Caltrans, 2008). A review of the traffic data has shown that the largest truck volumes are similar for both monitoring stations.

In addition, the $PM_{2.5}$ monitoring values at the Long Beach-East Pacific Coast Highway monitoring station are similar to those at the North Long Beach monitoring station. For the years 2004, 2005, and 2006, the 24-hour $PM_{2.5}$ concentrations measured at the Long Beach-East Pacific Coast Highway station were 59.7 $\mu g/m^3$, 50.8 $\mu g/m^3$, and 53.6 $\mu g/m^3$, respectively. Comparing these concentrations to the concentrations reported in Table 1 for the North Long Beach station shows the values are similar. Therefore, since the truck percentages and monitoring data at the North Long Beach station and Long Beach-East Pacific Coast Highway station are similar, the North Long Beach station reflects the same traffic conditions as at the project location, and the monitoring data are shown to be representative of ambient air quality for the project area.

Traffic Condition Improvement by Proposed Action

The purpose of building the SR-47 Expressway or the SR-103 Extension, along with the Schuyler Heim Bridge replacement, is to reduce traffic congestion on local surface streets between Terminal Island and Pacific Coast Highway as well as on I-110 and I-710. The project would also improve traffic conditions by eliminating at-grade railroad crossings and signalized intersections.

Currently, to connect from Terminal Island to Alameda Street, vehicles must travel 1.5 km (0.9 mi) north from Ocean Boulevard, then exit at the Henry Ford Avenue off-ramp and travel north through local streets, signalized intersections, and railroad crossings for about 2.0 km (1.2 mi) before joining Alameda Street just south of Pacific Coast Highway. Alameda Street continues north of Pacific Coast Highway for 4.0 km (2.5 mi) and connects to the I-405. About 5.5 km (3.4 mi) north of I-405, Alameda Street connects to the Artesia Freeway (SR-91).

The SR-47 Expressway (Alternatives 1 and 1A) would be built upon a network of local streets by constructing a high-capacity expressway connecting the Ocean Boulevard Interchange with Alameda Street at Pacific Coast Highway. When complete, the 2.7 km (1.7 mi) expressway would provide the missing link between the Ocean Boulevard interchange on Terminal Island and Alameda Street on the mainland. This link would allow traffic to continue north to connect to Pacific Coast Highway, I-405, and/or SR-91. The

proposed expressway would also help maximize use of the recently completed six-lane Alameda Street. In addition, the Ocean Boulevard/SR-47 flyover will divert traffic bound for northbound SR-47 directly onto the new bridge from eastbound Ocean Boulevard. The flyover would enable this traffic to avoid the signalized Ocean Boulevard/SR-47 intersection.

The SR-103 Extension (Alternative 2) is an alternative to the SR-47 Expressway, and would connect existing SR-103, beginning about 0.8 km (0.5 mi) north of Pacific Coast Highway, to Alameda Street at a point about 0.8 km (0.5 mi) south of the San Diego Freeway (I-405). The right lane of the flyover described above would continue to SR-103 after crossing the new bridge.

Alternative 3 is the bridge avoidance option, and would have the same traffic conditions as Alternative 1. Alternative 4 is the bridge replacement only option which would not affect the traffic conditions, comparable to the No Build alternative. Alternative 5 was not evaluated in this report because no traffic analysis was done for this alternative.

As a result of the proposed action, the delays due to traffic congestion would be reduced and the average vehicle travel speed would slightly increase in the project area. Both of these effects would translate into decreased vehicle emissions. In 2030, the LOS at the intersections within the project area would be improved by implementing the build alternatives 1, 1A, 2, and 3. Table 2 compares the PM peak hour intersection conditions of the No Build alternative to the build alternatives. Among the 22 intersections analyzed, the LOS of Alternatives 1, 1A, and 3 would improve at six intersections compared to the No Build alternative. The LOS of Alternative 2 would improve at four of the intersections. Two intersections, 223rd Street/Alameda Street connector ramp at Alameda Street and the 223rd Street and I-405 southbound ramps, would have a worse LOS when compared to the No Build alternative.

TABLE 2
2030 PM Peak Intersection Conditions (PCE)

Intersections	Alternative 6 (No Build), Alternative 4	Alternatives 1, 1A, 3	Alternative 2
SR-47 & New Dock SB Off-Ramp1	B	B	B
SR-47 & New Dock NB On-Ramp1	E	C	C
SR-47 & Henry Ford Ramps	F	C	E
Henry Ford Ave & Anaheim St	F	F	F
Henry Ford Ave & Denni St	D	C	D
Alameda St & Anaheim St	F	F	F
Alameda St / PCH Connector Ramp n/o PCH	F	F	B
PCH / Alameda St Connector Ramp e/o Alameda St	F	F	E
Alameda St / Sepulveda Blvd Connector Ramp n/o Sepulveda	F	F	F
Sepulveda Blvd / Alameda St Connector Ramp e/o Alameda St	F	E	E
Alameda St / 223rd St Connector Ramp s/o 223rd St	F	F	F

TABLE 2
2030 PM Peak Intersection Conditions (PCE)

Intersections	Alternative 6 (No Build), Alternative 4	Alternatives 1, 1A, 3	Alternative 2
223rd St / Alameda St Connector Ramp e/o Alameda St	E	F	F
223rd St & I-405 SB Ramps	B	C	C
Alameda St & I-405 NB Ramps	C	C	C
Alameda St / Carson St Connector Ramp s/o Carson St	C	B	C
Carson St / Alameda St Connector Ramp e/o Alameda St	A	A	A
Alameda St / Del Amo Blvd Connector Ramp s/o Del Amo	D	C	C
Del Amo Blvd / Alameda St Connector Ramp e/o Alameda St	C	A	B
Alameda St & SR-91 EB Ramps	A	A	A
Alameda St & Artesia Blvd n/o Artesia Blvd	A	A	A

Data provided by Meyer, Mohaddes Associates, 2007

Table 3 presents the daily vehicle miles traveled (VMT) within the project area for the No Build and build alternatives. Alternative 1 would have less total VMT when compared to the No Build alternative. There would be approximately a 2 percent increase in VMT for Alternative 2 when compared to Alternative 1, due to the increase of capacity of the extended SR-103. The truck percentages of the build alternatives are similar to those of the No Build alternative within the same year. The percentage of port trucks is expected to increase between 2003 and 2030 while the percentage of other trucks is expected to decrease.

An increase of $PM_{2.5}$ emissions would occur if the project significantly increased VMT in the project area, and at locations where there are more traffic delays. The traffic delays would occur at the intersections where vehicles are accumulating and idling. It is unlikely that $PM_{2.5}$ hot-spots would be associated with the proposed action because local accumulation and delay of vehicles would be reduced by the project. Table 2 shows that LOS improves with the build alternatives when compared to the No Build alternative. Potential localized $PM_{2.5}$ increases associated with this slight increase in VMT would be offset by the increase of vehicle speed in the project area, which is an indication of reduced congestion and idling of vehicles. Thus, the project is not expected to cause any concern with respect to localized concentrations of $PM_{2.5}$ (see the following sections for more detailed emission calculations).

In conclusion, reviewing the existing and projected traffic conditions has shown that the Proposed Action would improve the operations of the intersections and increase the vehicle speed in the project area. It is unlikely that $PM_{2.5}$ emissions associated with the Proposed Action would cause significant adverse impact to air quality.

TABLE 3
Daily Vehicle Miles Traveled and Percentages within the Project Area

Project Alternative	Cars		Port Trucks		Other Trucks		Total VMT
	Daily VMT	Percent of Total VMT	Daily VMT	Percent of Total VMT	Daily VMT	Percent of Total VMT	
2003 - Existing	3,762,790	86.6%	446,582	10.3%	133,242	3.1%	4,342,614
2011 - Alternative 6 (No Build), Alternative 4	3,683,868	85.2%	509,987	11.8%	128,848	3.0%	4,322,704
2011 - Alternative 1, 1A, 3	3,696,964	85.5%	496,472	11.5%	128,981	3.0%	4,322,417
2011 - Alternative 2	3,857,134	87.3%	454,902	10.3%	105,845	2.4%	4,417,883
2015 - Alternative 6 (No Build), Alternative 4	3,867,096	83.9%	609,988	13.2%	131,813	2.9%	4,608,899
2015 - Alternative 1, 1A, 3	3,881,725	84.3%	593,061	12.9%	132,236	2.9%	4,607,023
2015 - Alternative 2	3,913,907	84.1%	604,778	13.0%	133,812	2.9%	4,652,497
2030 - Alternative 6 (No Build), Alternative 4	4,384,500	81.1%	874,743	16.2%	144,870	2.7%	5,404,114
2030 - Alternative 1, 1A, 3	4,407,170	81.6%	845,124	15.7%	146,453	2.7%	5,398,748
2030 - Alternative 2	4,436,443	81.5%	858,343	15.8%	146,750	2.7%	5,441,537

Data provided by Meyer, Mohaddes Associates.

Direct Operational Emissions – Vehicle Operational Emissions

To further illustrate that the proposed project would not cause significant adverse impact to the ambient air quality, vehicle operation emissions of $PM_{2.5}$ were estimated and compared with the No Build alternative. The emission analysis was performed for the entire project study area because the proposed improvements along the Schuyler Heim Bridge, SR-47, or SR-103 corridors would likely affect vehicle traffic patterns on other nearby roads, not just along the roadways with proposed improvements. As a result, traffic conditions and vehicle emissions would be affected by the project in a broader area. The project study area includes the area between Interstates 710, 110, 405, and Ocean Boulevard.

Vehicle Exhaust Emissions

$PM_{2.5}$ emissions from vehicles traveling in the project study area were calculated for the years 2003, 2011, 2015, and 2030. Daily VMT data for 2003, 2011, 2015, and 2030 were provided by Meyer, Mohaddes Associates (see Attachment 1, Table 1 for details). $PM_{2.5}$ emissions were estimated for Alternatives 1, 1A, 2, 3, and the No Build alternative (Alternative 6). Emission factors for $PM_{2.5}$ were obtained from EMFAC2007 (CARB, 2007). Emissions were calculated based on three major categories of vehicles: autos, heavy-duty trucks (regional), and port trucks. Emissions from autos were calculated using EMFAC2007 emission factors representing the Los Angeles County vehicle mix. To be conservative, $PM_{2.5}$ emissions from regional and port trucks were calculated using the EMFAC2007 emission factors for heavy-duty diesel trucks. The emission factors selected from the EMFAC2007 results were based on the vehicle speeds shown in Table 4. Detailed emission calculations of vehicle exhaust emissions are shown in Attachment 1, Table 1.

TABLE 4
Average Speeds

Project Alternative	Average Speed
2003 - Existing	41
2011 - No Build	47
2011 - Alternative 1	48
2011 - Alternative 2	48
2015 - No Build	45
2015 - Alternative 1	46
2015 - Alternative 2	46
2030 - No Build	37
2030 - Alternative 1	39
2030 - Alternative 2	39

Data provided by Meyer, Mohaddes Associates.

As shown in Table 5, $PM_{2.5}$ emissions from Alternatives 1, 1A, 2, and 3 would be slightly lower than those from the No Build alternative. The emissions in Table 5 were conservatively estimated based on the average vehicle speed for the entire project area. The emission

decrease for Alternatives 1, 1A, and 3 are due to a predicted decrease in VMT in the study area and an increase in vehicle speed for 2011, 2015, and 2030. Although there would be a slight increase in VMT for Alternative 2, due to increased capacity from the extension of SR-103, the $PM_{2.5}$ emissions for Alternative 2 in 2011 and 2030 would still be less than the No Build alternative. However, in the year 2015, there would be a greater number of "other truck" VMT (see Table 3) for Alternative 2 which would result in slightly higher emissions when compared to the No Build alternative. Emissions of Alternative 4 are predicted to be the same as those for the No Build alternative because the VMT and vehicle mix in the project area is predicted to be the same. Emissions associated with Alternative 5 were not discussed in this analysis because there is no traffic information available for Alternative 5.

TABLE 5
Daily Vehicle Emissions for the Project Study Area

Year	$PM_{2.5}$ (lb/day)				
	No Build	Alternative 1, 1A	Alternative 2	Alternative 3	Alternative 4
2003	901	--	--	--	--
2011	669	665	632	665	669
2015	577	574	582	574	577
2030	455	441	445	441	455

Overall, $PM_{2.5}$ emissions of the build alternatives would be the same or less than the No Build alternative. In addition, the exhaust emissions in 2030 would be much lower than those in 2011 (project opening year), attributed to the addition of newer vehicles with greater emission controls in future years. Based on the current ambient $PM_{2.5}$ concentrations in the project area, the project is not expected to have significant localized $PM_{2.5}$ concentration increase when compared to the No Build alternative.

Re-entrained Road Dust

Re-entrained road dust was estimated based on VMT and Chapter 13.2.1 of *AP-42, Fifth Edition, Compilation of Air Pollutant Emission Factors* (EPA, 2006). The emission inventories presented in the SCAQMD 2007 AQMP show that emissions from paved roads are the single largest contributor to the directly emitted $PM_{2.5}$. According to the PM Guide, $PM_{2.5}$ emissions from re-entrained road dust must only be considered if the EPA or state air agency have made a finding that these emissions are a significant contributor to the $PM_{2.5}$ problem in a given area (40 CFR 93.102[b][3]). Since the SCAQMD 2007 AQMP is incorporated as part of the California 2007 SIP, $PM_{2.5}$ from re-entrained road dust was included in the hotspot analysis.

Table 6 presents the paved road emissions for the years 2003, 2011, 2015, and 2030. Detailed emission calculations of vehicle exhaust emissions are shown in Attachment 1, Table 2. The $PM_{2.5}$ emissions for the build alternatives would be the same or less than the No Build alternative for each year analyzed. Paved road emissions are expected to increase with time because the calculation of paved road emissions is based on VMT and vehicle weight. Since

the VMT and the percentage of trucks are predicted to increase with time, the paved road emissions would also increase with time. This finding is consistent with the emission inventories reported in the SCAQMD 2007 AQMP, which also show paved road emissions increasing with time. Since paved road emissions are included in the 2007 AQMP, which is part of the California SIP, paved road emissions have been accounted for as part of the $PM_{2.5}$ attainment plan. Therefore, the proposed project is unlikely to cause new violations or increase the frequency or severity of any existing violations, or delay timely attainment of the $PM_{2.5}$ NAAQS.

TABLE 6
Re-entrained Road Dust Emissions for the Project Study Area

Year	$PM_{2.5}$ (lb/day)				
	No Build	Alternative 1, 1A	Alternative 2	Alternative 3	Alternative 4
2003	6,430	--	--	--	--
2011	7,182	7,010	6,181	7,010	7,182
2015	8,448	8,232	8,393	8,232	8,448
2030	11,941	11,554	11,724	11,554	11,941

Overall, $PM_{2.5}$ emissions of the four build alternatives would be the same or less than the No Build alternative. In addition, the exhaust emissions in 2030 would be much lower than those in 2011 (project opening year), attributed to the addition of newer vehicles with greater emission controls in future years.

Conclusions

This project is identified as a Transportation Control Measure (TCM) project in the RTP and RTIP; its timely implementation is a crucial element in the reduction of air pollutant emissions from roadway transportation sources. Overall, $PM_{2.5}$ emissions of the build alternatives would be the same or less than the No Build alternative. In addition, the exhaust emissions in 2030 would be much lower than those in 2011 (project opening year), attributed to the addition of newer vehicles with greater emission controls in future years. Based on the current ambient $PM_{2.5}$ concentrations in the project area, the project is not expected to have significant localized $PM_{2.5}$ concentration increase when compared to the No Build alternative. The proposed action is unlikely to cause new violations or increase the frequency or severity of any existing violations, or delay timely attainment of the $PM_{2.5}$ NAAQS. Therefore, the project meets the conformity hot-spot requirements in 40 CFR §93.116 and §93.123 for $PM_{2.5}$.

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Attachment 1
Vehicle Operational Emissions Calculations

Appendix M
Table 1: Vehicle Operational Emission Calculations

A. Project Area VMT

Scenario	Daily VMT Cars	Daily VMT Other	Daily VMT Port Trucks	Average Speed
2003 - Existing	3,762,790	133,242	446,582	41.3
2011 - No Build	3,683,868	128,848	509,987	46.9
2011- Alternative 1	3,696,964	128,981	496,472	47.5
2011 - Alternative 2	3,857,134	105,845	454,902	47.7
2015 - No Build	3,867,096	131,813	609,988	44.8
2015 - Alternative 1	3,881,725	132,236	593,061	45.7
2015 - Alternative 2	3,913,907	133,812	604,778	46.3
2030 - No Build	4,384,500	144,870	874,743	37.4
2030 - Alternative 1	4,407,170	146,453	845,124	38.6
2030 - Alternative 2	4,436,443	146,750	858,343	39.3

Note:
1. The VMT by vehicle type and average speeds by alternative were provided by Meyer, Mohaddes.

B. Vehicle Emission Factors

	Vehicle Type	Emission Factors g/mile					
Year 2003		**CO**	**NOx**	**ROG**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
	Regional Cars	5.290	1.129	0.225	0.008	0.052	0.035
Speed 41 mph	Heavy-Duty Trucks	8.353	13.498	0.803	0.110	0.547	0.478
Year 2011							
	Regional Cars	2.316	0.670	0.089	0.004	0.046	0.030
Speed 47 mph	Heavy-Duty Trucks	4.072	9.015	0.493	0.014	0.357	0.302
	Regional Cars	2.307	0.674	0.089	0.004	0.046	0.030
Speed 48 mph	Heavy-Duty Trucks	4.059	9.062	0.491	0.014	0.360	0.305
Year 2015							
	Regional Cars	1.726	0.466	0.062	0.004	0.043	0.028
Speed 45 mph	Heavy-Duty Trucks	2.719	5.590	0.347	0.014	0.255	0.207
	Regional Cars	1.713	0.468	0.062	0.004	0.043	0.028
Speed 46 mph	Heavy-Duty Trucks	2.707	5.605	0.343	0.014	0.257	0.209
Year 2030							
	Regional Cars	0.878	0.178	0.030	0.004	0.040	0.025
Speed 37 mph	Heavy-Duty Trucks	1.186	1.860	0.184	0.015	0.108	0.095
	Regional Cars	0.856	0.176	0.029	0.004	0.040	0.024
Speed 39 mph	Heavy-Duty Trucks	1.168	1.827	0.175	0.015	0.108	0.095

1. Assumed the EMFAC2007 fleet average emission factor represented the Regional Cars.
2. Assumed the EMFAC2007 vehicle class 'HHDT diesel' emission factor represented HDT trucks and port trucks.
3. The PM_{10} and $PM_{2.5}$ emission factors represent the sum of the emissions from exhaust, brake wear, and tire wear.

Appendix M

C. Vehicle Operational Emissions

Scenario	VMT Category	Emissions in gram/day					
		CO	NOx	ROG	SO_2	PM_{10}	$PM_{2.5}$
2003 - Existing	Daily VMT Cars	19,905,158	4,248,190	846,628	30,102	195,665	131,698
	Daily VMT Other Trucks	1,112,968	1,798,496	106,993	14,657	72,883	63,690
	Daily VMT Port Trucks	3,730,296	6,027,958	358,605	49,124	244,280	213,466
2011- No Build	Daily VMT Cars	8,531,838	2,468,191	327,864	14,735	169,458	110,516
	Daily VMT Other Trucks	524,670	1,161,567	63,522	1,804	45,999	38,912
	Daily VMT Port Trucks	2,076,668	4,597,534	251,424	7,140	182,065	154,016
2011- Alternative 1	Daily VMT Cars	8,528,895	2,491,754	329,030	14,788	170,060	110,909
	Daily VMT Other Trucks	523,534	1,168,826	63,330	1,806	46,433	39,339
	Daily VMT Port Trucks	2,015,178	4,499,025	243,768	6,951	178,730	151,424
2011 - Alternative 2	Daily VMT Cars	8,898,409	2,599,708	343,285	15,429	177,428	115,714
	Daily VMT Other Trucks	429,627	959,172	51,970	1,482	38,104	32,283
	Daily VMT Port Trucks	1,846,449	4,122,325	223,357	6,369	163,765	138,745
2015- No Build	Daily VMT Cars	6,674,609	1,802,067	239,760	15,468	166,285	108,279
	Daily VMT Other Trucks	358,400	736,836	45,739	1,845	33,612	27,285
	Daily VMT Port Trucks	1,658,558	3,409,833	211,666	8,540	155,547	126,268
2015- Alternative 1	Daily VMT Cars	6,649,395	1,816,647	240,667	15,527	166,914	108,688
	Daily VMT Other Trucks	357,963	741,184	45,357	1,851	33,985	27,637
	Daily VMT Port Trucks	1,605,417	3,324,109	203,420	8,303	152,417	123,950
2015 - Alternative 2	Daily VMT Cars	6,704,522	1,831,708	242,662	15,656	168,298	109,589
	Daily VMT Other Trucks	362,228	750,014	45,897	1,873	34,390	27,967
	Daily VMT Port Trucks	1,637,135	3,389,782	207,439	8,467	155,428	126,399
2030 - No Build	Daily VMT Cars	3,849,591	780,441	131,535	17,538	175,380	109,612
	Daily VMT Other Trucks	171,816	269,458	26,656	2,173	15,646	13,763
	Daily VMT Port Trucks	1,037,445	1,627,022	160,953	13,121	94,472	83,101
2030 - Alternative 1	Daily VMT Cars	3,772,537	775,662	127,808	17,629	176,287	105,772
	Daily VMT Other Trucks	171,057	267,569	25,629	2,197	15,817	13,913
	Daily VMT Port Trucks	987,105	1,544,042	147,897	12,677	91,273	80,287
2030 - Alternative 2	Daily VMT Cars	3,797,595	780,814	128,657	17,746	177,458	106,475
	Daily VMT Other Trucks	171,404	268,111	25,681	2,201	15,849	13,941
	Daily VMT Port Trucks	1,002,545	1,568,193	150,210	12,875	92,701	81,543

Appendix M

C. Vehicle Operational Emissions Continued

Scenario	VMT Category	Emissions in pound/day					
		CO	NOx	ROG	SO_2	PM_{10}	$PM_{2.5}$
2003 - Existing	Daily VMT Cars	43,883	9,365	1,866	66	431	290
	Daily VMT Other Trucks	2,454	3,965	236	32	161	140
	Daily VMT Port Trucks	8,224	13,289	791	108	539	471
2011- No Build	Daily VMT Cars	18,809	5,441	723	32	374	244
	Daily VMT Other Trucks	1,157	2,561	140	4	101	86
	Daily VMT Port Trucks	4,578	10,136	554	16	401	340
2011- Alternative 1	Daily VMT Cars	18,803	5,493	725	33	375	245
	Daily VMT Other Trucks	1,154	2,577	140	4	102	87
	Daily VMT Port Trucks	4,443	9,918	537	15	394	334
2011 - Alternative 2	Daily VMT Cars	19,617	5,731	757	34	391	255
	Daily VMT Other Trucks	947	2,115	115	3	84	71
	Daily VMT Port Trucks	4,071	9,088	492	14	361	306
2015 - No Build	Daily VMT Cars	14,715	3,973	529	34	367	239
	Daily VMT Other Trucks	790	1,624	101	4	74	60
	Daily VMT Port Trucks	3,656	7,517	467	19	343	278
2015 - Alternative 1	Daily VMT Cars	14,659	4,005	531	34	368	240
	Daily VMT Other Trucks	789	1,634	100	4	75	61
	Daily VMT Port Trucks	3,539	7,328	448	18	336	273
2015 - Alternative 2	Daily VMT Cars	14,781	4,038	535	35	371	242
	Daily VMT Other Trucks	799	1,653	101	4	76	62
	Daily VMT Port Trucks	3,609	7,473	457	19	343	279
2030 - No Build	Daily VMT Cars	8,487	1,721	290	39	387	242
	Daily VMT Other Trucks	379	594	59	5	34	30
	Daily VMT Port Trucks	2,287	3,587	355	29	208	183
2030 - Alternative 1	Daily VMT Cars	8,317	1,710	282	39	389	233
	Daily VMT Other Trucks	377	590	57	5	35	31
	Daily VMT Port Trucks	2,176	3,404	326	28	201	177
2030 - Alternative 2	Daily VMT Cars	8,372	1,721	284	39	391	235
	Daily VMT Other Trucks	378	591	57	5	35	31
	Daily VMT Port Trucks	2,210	3,457	331	28	204	180

Appendix M
D. Summary Vehicle Operational Emissions

Scenario	Emissions (pound/day)					
	CO	NOx	ROG	SO_2	PM_{10}	$PM_{2.5}$
2003 - Existing	54,560	26,620	2,893	207	1,131	901
2011 - No Build	24,544	18,138	1,417	52	876	669
2011 - Alternative 1	24,399	17,989	1,402	52	871	665
2011 - Alternative 2	24,635	16,934	1,364	51	836	632
2011 - Alternative 3	24,399	17,989	1,402	52	871	665
2011 - Alternative 4	24,544	18,138	1,417	52	876	669
2015 - No Build	19,161	13,114	1,096	57	784	577
2015 - Alternative 1	18,988	12,967	1,079	57	779	574
2015 - Alternative 2	19,188	13,165	1,093	57	789	582
2015 - Alternative 3	18,988	12,967	1,079	57	779	574
2015 - Alternative 4	19,161	13,114	1,096	57	784	577
2030 - No Build	11,153	5,902	704	72	629	455
2030 - Alternative 1	10,870	5,704	664	72	625	441
2030 - Alternative 2	10,960	5,770	671	72	631	445
2030 - Alternative 3	10,870	5,704	664	72	625	441
2030 - Alternative 4	11,153	5,902	704	72	629	455

1. It was assumed that Alternative 3 and 4 would have the same emissions as Alternatives 1 and No-Build, respectively. Alternative 3 is the bridge avoidance option, which would have the same traffic conditions as Alternative 1. Alternative 4 is the bridge replacement that would not affect the traffic conditions compared to the No-Build Alternative.

Appendix M
Table 2: Paved Road Dust Calculations

Paved Roads emission factor from AP-42, Section 13.2.1: *Paved Roads* (11/06)

E= [k(sL/2)^0.65(W/3)^1.5 -C]*(1-P/4N)

where:

k =	0.016	lb/VMT [AP-42, Table 13.2.1-1, for PM_{10}]
k =	0.0024	lb/VMT [AP-42, Table 13.2.1-1, for $PM_{2.5}$]
sL =	0.407	[silt loading (g/m2)), SCAQMD CEQA Handbook November 1993,Table A9-9-C-1, Major Street/Highwa
W=	see Table 2	tons [Average vehicle weight]
C=	0.00047	lb/VMT [AP-42, Table 13.2.1-2, for PM_{10}]
C=	0.00036	lb/VMT [AP-42, Table 13.2.1-2, for $PM_{2.5}$]
P =	33	days [Average number of days with > 0.01 inches of precipitation for Los Angeles, http://www.wrcc.dri.edu/summary/Climsmsca.html]
N =	365	days [Number of days in the averaging period]

A. Paved Road Emission Factors

Scenario	$E_{(PM2.5)}$ lb/VMT
2003 - Existing	0.001
2011 - No Build	0.002
2011 - Alternative 1	0.002
2011 - Alternative 2	0.001
2015 - No Build	0.002
2015 - Alternative 1	0.002
2015 - Alternative 2	0.002
2030 - No Build	0.002
2030 - Alternative 1	0.002
2030 - Alternative 2	0.002

B. Calculation of Average Vehicle Weight

Scenario	Daily VMT Cars	Car Vehicle Weight (tons)	Daily VMT Other Trucks	Daily VMT Port Trucks	Truck Vehicle Weight (tons)	W = Average Vehicle Weight (tons)
2003 - Existing	3,762,790	2	133,242	446,582	25	5.07
2011 - No Build	3,683,868	2	128,848	509,987	25	5.40
2011 - Alternative 1	3,696,964	2	128,981	496,472	25	5.33
2011 - Alternative 2	3,857,134	2	105,845	454,902	25	4.92
2015 - No Build	3,867,096	2	131,813	609,988	25	5.70
2015 - Alternative 1	3,881,725	2	132,236	593,061	25	5.62
2015 - Alternative 2	3,913,907	2	133,812	604,778	25	5.65
2030 - No Build	4,384,500	2	144,870	874,743	25	6.34
2030 - Alternative 1	4,407,170	2	146,453	845,124	25	6.22
2030 - Alternative 2	4,436,443	2	146,750	858,343	25	6.25

Vehicle weights based on weight class in EMFAC2007 for passenger cars and heavy-heavy duty trucks.

C. Paved Road Emissions

Alternative	$PM_{2.5}$ (lb/day)
2003 - Existing	6,430
2011 - No Build	7,182
2011 - Alternative 1	7,010
2011 - Alternative 2	6,181
2015 - No Build	8,448
2015 - Alternative 1	8,232
2015 - Alternative 2	8,393
2030 - No Build	11,941
2030 - Alternative 1	11,554
2030 - Alternative 2	11,724

Appendix M
Table 3: Marine Vessel Detour Emission Calculation - during Operation

A. Emission Factors of PM10, NOx, CO, and ROG

Emission factor = a (Load Factor)$^{-x}$ + b

Emission Factor Calculations

Pollutant	Emission Calculation Factor				non-ocean going ships	
				Activity	slow cruise	maneuvering
				Load factor [1]	0.4	0.2
	x	b	a	Emission factor	(g/kw-hr)	(g/kw-hr)
PM 10	1.5	0.2551	0.0059		0.278	0.321

[1] Used the load factor of non-oceangoing ships provided in the Analysis of Commercial Marine Vessel Emissions and Fuel Consumption Data (EPA, Feb. 2000).

B. Emission Calculations

		Fishing		Tug Boats		Yachts		Harbor Operation		Tankers (main engine)		Tankers (auxiliary)		
		slow cruise	maneuvering	slow cruise	maneuvering	slow cruise	maneuvering	slow cruise	maneuvering	slow cruise	maneuvering	slow cruise	maneuvering	
	Load Factor	0.4	0.2	0.4	0.2	0.4	0.2	0.4	0.2	0.4	0.2	1.0	1.0	
	HP	1106.0	1106.0	4268.0	4268.0	1863.0	1863.0	5046.0	5046.0	7500.0	7500.0	1006.0	1676.0	
	Detour Hours	3.1	3.1	644.9	644.9	138.9	138.9	14.0	14.0	3.1	3.1	3.1	3.1	Total
Annual Emissions		lb/year	lb/year	lb/year	lb/year	lb/year	lb/year	lb/year	lb/year	lb/year	lb/year	lb/year	lb/year	ton/year
	PM 10	0.6	0.4	503.9	290.6	47.4	27.3	13.0	7.5	4.3	2.5	1.4	2.8	**0.5**
Daily Emissions		lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
	PM 10	0.002	0.001	1.381	0.796	0.130	0.075	0.036	0.021	0.012	0.007	0.004	0.008	**2.5**

1. HP ratings and load factors were obtained from the Analysis of Commercial Marine Vessel Emissions and Fuel Consumption Data (EPA, Feb. 2000).

2. Marine vessel detour hours data source: Draft Schuyler Heim Bridge Replacement and SR-47 Expressway Project: Long Term Economic Impacts to Marine Vessel Operation in the Cerritos Channel, CH2M HILL, 2005.

3. Tankers main engine HP ratings were assumed to the average of the two chemical tankers "Spring Virgo" and "Cherry Galaxy" which were recorded by Caltrans to pass through the bridge during 2003 to 2005.
Tanker's auxiliary engine HP rating were obtained from the Analysis of Commercial Marine Vessel Emissions and Fuel Consumption Data (EPA, Feb. 2000).

4. Tankers were assumed to use the same diesel as required by the California Diesel Fuel Regulations.

D. Marine Vessel Detour Emissions Increase Summary During Operation (Daily)

	Detour hours (hours/day)	PM10 (lb/day)	PM2.5 (lb/day)
Tugs	3.53	2.18	2.00
Harbor Operations	0.077	0.056	0.052
Fishing	0.017	0.003	0.003
Yachts	0.76	0.20	0.19
Tankers	0.017	0.030	0.028
Marine Vessel Detour Emissions		2.47	2.27

Appendix N
MSAT Analysis

Appendix N
Mobile Source Air Toxics (MSAT) Analysis

Schuyler Heim Bridge Replacement and SR-47 Expressway Project

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Introduction

This analysis was prepared to evaluate the mobile source air toxic (MSAT) emissions for the Schuyler Heim Bridge replacement and SR-47 Expressway project. On February 3, 2006, the Federal Highway Administration (FHWA) issued the following guidance: "*Interim Guidance on Air Toxic Analysis for National Environmental Policy Act (NEPA) Documents*" (Interim Guidance) to address mobile source air toxics from transportation projects. The purpose of the Interim Guidance is to provide advice for analyzing MSAT emissions as part of the NEPA process for highway projects. MSAT emissions for the proposed action were evaluated for the existing condition (2003) and the No-Build alternative, Alternative 1, and Alternative 2 for the years 2015 and 2030. First, this document presents an explanation of why a quantitative MSAT analysis was selected for the project. This discussion is followed by the MSAT analysis which includes background, methodology, results, and finally, a discussion of the limitations of evaluating MSAT emissions at this time.

Selection of MSAT Analysis Type

The following discussion explains why a quantitative analysis was selected for the proposed action. The Interim Guidance identified the following three levels of MSAT analysis and examples of projects for each level:

1. No Analysis: for projects with no potential for meaningful MSAT effects. For example, projects qualifying as a categorical exclusion under 23 CFR 771.117(c), projects exempt under the Clean Air Act (CAA) conformity rule under 40 CFR 93.126, or other projects with no meaningful impacts on traffic volumes or vehicle mix.

2. Qualitative Analysis: for projects with low potential MSAT effects. For example, minor widening projects, new interchanges, projects that improve operations of highways, transit, or freight without adding substantial new capacity or without creating a facility that is likely to meaningfully increase emissions.

3. Quantitative Analysis: to differentiate alternatives for projects with higher potential MSAT effects. Projects that would be in the category must:

    a. Create or significantly alter a major intermodal freight facility that has the potential to concentrate high levels of diesel particulate matter (DPM) in a single location; or

b. Create new, or add significant capacity, to urban highways such as interstates, urban arterials, or urban collector-distributor routes with traffic volumes where the average annual daily traffic (AADT) is projected to be in the range of 140,000 to 150,000 or greater by the design year; **AND**

c. Proposed to be located in proximity to populated areas or in rural areas, or in proximity to concentrations of vulnerable populations (i.e. schools, nursing homes, hospitals).

In order to determine which level of MSAT analysis would be used for the project, the following alternatives were reviewed:

Alternative 1 Bridge Replacement and Expressway: Under this alternative, the existing Commodore Schuyler F. Heim Bridge (Schuyler Heim Bridge) would be replaced to meet current seismic criteria and provide an elevated through-lane (Ocean Boulevard/ SR-47 Flyover [flyover]) from eastbound Ocean Boulevard onto northbound SR-47. This alternative calls for construction of a new SR-47 expressway to provide a high-capacity alternative route along the Alameda Corridor for traffic between Terminal Island and Alameda Street, south of Pacific Coast Highway. The structural variation of Alternative 1 is Alternative 1A, which will improve the aesthetics of the replacement bridge over the Cerritos Channel and span a greater horizontal distance across the channel between columns.

Alternative 2 SR-103 Extension to Alameda Street: Under this alternative, the existing Schuyler Heim Bridge would be demolished and a new fixed-span bridge and flyover would be constructed, as described under Alternative 1. This alternative also would extend SR-103 to the northwest on a four-lane elevated viaduct to join Alameda Street between Sepulveda Boulevard and I-405.

Alternative 3 Bridge Avoidance: Under this alternative, the existing Schuyler Heim Bridge would be preserved and a new fixed-span bridge would be constructed on an alignment east of the existing bridge. In addition, the flyover, as described in Alternative 1, would be constructed.

Alternative 4 Bridge Replacement Only: Under this alternative, the existing Schuyler Heim Bridge (a lift bridge) would be replaced with a fixed-span bridge largely along the existing bridge alignment; however, no roadway improvements would occur.

Alternative 5 Transportation System Management: Under this alternative, improvements would be made to routes that parallel the proposed SR-47 Expressway and measures to improve capacity and traffic circulation at the Port of Long Beach and Port of Los Angeles through policy changes and use of the latest technologies.

Alternative 6 No-Build: Under this alternative, no changes would be made to the existing Schuyler Heim Bridge or roadway system.

Upon reviewing the alternatives and the Interim Guidance analysis levels, it was concluded that a quantitative analysis was the appropriate level for the proposed action. The major arterials affected by the project serve a large number of diesel trucks and there would be a potential to concentrate high levels of DPM. In addition, the immediate vicinity of the project area includes the community of Wilmington in Los Angeles. The community of

Wilmington is just west of the proposed SR-47 Expressway and includes sensitive air quality receptors such as residences, schools, and hospitals. The project qualifies for a quantitative MSAT analysis because (1) the project would serve diesel trucks with the potential to concentrate diesel particulate matter and (2) the proximity of the project area to sensitive receptors.

Since Alternatives 1A and 3 would have the same traffic conditions as Alternative 1 and Alternative 4 would not affect the traffic conditions when compared to the No-Build Alternative, it was assumed that Alternatives 1A, 3 would have the same MSAT emissions as Alternatives 1, and Alternative 4 would have the same emissions as Alternative 6. In addition, a traffic analysis was not performed for Alternative 5. Therefore, the MSAT analysis will only include a discussion of Alternatives 1, 2, and 6.

Background

On March 29, 2001, the U.S. Environmental Protection Agency (EPA) issued the Final Rule *Control of Emissions of Hazardous Air Pollutants from Mobile Sources* (40 CFR Parts 80 and 86). The rule listed 21 compounds emitted from motor vehicles that are known or suspected to cause cancer or other serious health effects. As part of the rule, the EPA examined the mobile source contribution of MSATs to national inventories and the impacts of existing and newly promulgated mobile source control programs, such as the reformulated gasoline (RFG) program, the national low emission vehicle (NLEV) standards, the Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and the proposed heavy-duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 1990 and 2020, the EPA projects these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 67 to 76 percent, and will reduce on-highway diesel particulate matter (PM) emissions by 90 percent. EPA also identified six of the 21 compounds and termed these compounds priority MSATs. The six priority MSATs are DPM/diesel exhaust organic gases, acetaldehyde, acrolein, benzene, 1,3-butadiene, and formaldehyde. According to the Interim Guidance, these six priority MSATs should be analyzed for projects warranting MSAT analysis.

The Interim Guidance refers to the EPA on-road emissions model, MOBILE6.2, which includes MSAT emission factors, for quantitative MSAT analyses. However, the California Air Resources Board (CARB) maintains a separate on-road emissions model for California called EMFAC. EMFAC does not contain MSAT emission factors so a tool was developed by the California Department of Transportation (Caltrans) and the University of California, Davis (UCD) specifically for projects located in California that uses EMFAC emission factors. Since the project is located in California, the UCD-Caltrans methodology was used to estimate MSAT emissions.

Methodology

MSAT emissions were estimated using the methodology and software tool developed by UCD in cooperation with Caltrans. The guidance, *Estimating Mobile Source Air Toxics Emissions: A Step-by-Step Project Analysis Methodology* (UCD, 2006a), and software tool *Project-Level Mobile Source Air Toxics Analysis: Spreadsheet Tool*, version 1.2 (UCD, 2006b)

(MSAT Tool), were used to develop benzene, acrolein, acetaldehyde, 1,3-butadiene, and formaldehyde emission factors from EMFAC2007 total organic gas (TOG) emission factors. The diesel particulate matter emission factors from EMFAC2007 were used to estimate diesel truck emissions. The project-specific traffic data (e.g., trips and speed) were provided by Meyer, Mohaddes, and Associates. EMFAC2007 is the on-road emissions model developed and updated by CARB. The EMFAC2007 emission factors used in the analysis were for the South Coast Air Basin (Basin). MSAT emissions for the proposed action were evaluated for the existing condition (2003) and the No-Build alternative, Alternative 1, and Alternative 2 for the years 2015 and 2030.

MSAT emissions were estimated based on vehicle type, posted speed limits, average daily vehicle trips, and segment length. Emissions were estimated for automobiles, SCAG trucks, and port trucks for the major roadway segments in the project area. Posted speed limits were a combination of data provided by Meyer, Mohaddes Associates and data from the Southern California Association of Governments (SCAG). MSAT emissions were evaluated by roadway segments contained within the boundary of State Route 91 (SR-91) to the north, Interstate 110 (I-110) to the west, Interstate 710 (I-710) to the east, and Ocean Boulevard to the south. The roadway segment lengths, posted vehicle speeds, and average daily trips are presented in Tables 1a through 1g.

For the 2015 emissions (both Port and non-Port trucks), the diesel truck emissions factors for DPM were assumed to be reduced by an additional 10 percent to account for two AB 32 discrete early action measures, the low carbon fuel standard (LCFS) and the Heavy-Duty Vehicle Greenhouse Gas Reduction Measure (similar to EPA's SmartWay truck fuel efficiency program). These discrete early action measures are scheduled to be adopted by ARB and enforceable by 2010. In 2030, for both Port and non-Port trucks, the diesel truck emissions factors for DPM were assumed to be reduced by an additional 35 percent. This reduction would come from a combination of the LCFS, increased fuel efficiency, and vehicle hybridization strategies outlined in CARB's proposed scoping plan for AB 32. The 35 percent% reduction wais based on the assumption that 100 percent% of the remaining diesel trucks would use biodiesel as an alternative fuel or an equivalent alternative fuel. Biodiesel produces approximately 35 percent less particulate matter emissions than conventional diesel fuel.

TABLE 1A. EXISTING (YEAR 2003) MSAT TRAFFIC DATA INPUTS

Road Segment	Segment Length (miles)	Posted Speed (mph)	Average Daily Trips (vehicles per day)			
			Port Trucks	Automobiles	SCAG Trucks	
					Gasoline Fuel	Diesel Fuel
SR-47 Mainline, New Dock Ramps to HF Ramps	0.75	40	11,503	5,619	127	75
Henry Ford Ramps	0.15	30	4,324	2,791	1	0
Henry Ford n/o Ramps to Alameda	0.68	30	4,930	11,041	387	231
SR-103 begin (at SR-47 /Henry Ford Junction) to Anaheim	0.95	40	7,177	2,826	124	74
SR-103 Anaheim to PCH	0.57	40	7,699	2,758	148	88
SR-103 PCH to Sepulveda/Willow	1.02	40	5,581	1,956	144	85
E and W Harry Bridges, Figueroa to start Alameda	1.44	35	2,724	12,476	185	110
Alameda beginning (E Harry Bridges) to Anaheim	0.77	35	2,704	13,705	206	123
Alameda Anaheim to Henry Ford	0.42	35	1,758	11,577	282	168
Alameda Henry Ford to PCH	0.34	35	5,695	16,262	500	298
Alameda PCH to 405	2.27	40	3,537	36,044	1,089	648
Alameda 405 to del Amo	1.72	45	1,405	33,859	916	545
Alameda, Del Amo to South Santa Fe Avenue	0.84	45	1,310	27,874	853	507
Alameda, South Santa Fe Ave to SR-91	1.15	45	704	39,859	1,566	931
I-110, "C" Street Interchange to Anaheim	0.49	65	10,888	114,025	2,092	1,245
I-110, Anaheim to PCH	0.80	65	10,851	124,001	2,364	1,407
1-110, PCH to Sepulveda	1.39	65	10,729	158,807	3,332	1,982
I-110, Sepulveda to Carson	1.56	65	10,066	185,234	4,344	2,585
I-110, Carson to Del Amo	1.02	65	9,572	212,999	5,108	3,039
I-110, Del Amo to 405	0.74	65	9,279	226,868	5,658	3,366
I-110, 405 to SR-91	1.09	65	7,762	256,494	7,857	4,674
I-710, Anaheim to PCH	0.50	65	25,330	109,345	2,892	1,720
I-710, PCH to Willow	1.01	65	27,542	125,268	3,511	2,089
I-710, Willow to 405	1.52	65	27,498	133,369	3,662	2,178
I-710, 405 to Del Amo	1.42	65	24,309	184,078	5,614	3,339
I-710, Del Amo to Long Beach Blvd Interchange	1.17	65	23,381	183,027	6,118	3,640

TABLE 1A. EXISTING (YEAR 2003) MSAT TRAFFIC DATA INPUTS

Road Segment	Segment Length (miles)	Posted Speed (mph)	Average Daily Trips (vehicles per day)			
			Port Trucks	Automobiles	SCAG Trucks	
					Gasoline Fuel	Diesel Fuel
I-710, Long Beach Boulevard to SR-91	0.96	65	22,970	195,662	6,594	3,923
PCH-110 to Alameda	2.38	50	673	21,826	330	197
PCH, Alameda to SR-103	0.94	50	368	19,435	343	204
PCH, SR-103 to I-710	0.98	50	4,300	20,731	406	241
Sepulveda, I-110 to Avalon	1.37	40	129	24,978	502	299
Sepulveda, Avalon to Alameda	1.70	40	182	20,622	496	295
Sepulveda, Alameda to ICTF	0.67	40	1,224	21,177	348	207
Sepulveda, ICTF to SR-103	0.17	40	5,581	20,521	352	209
Del Amo, Wilmington to Alameda	2.96	40	110	20,778	895	533
Del Amo, Alameda to I-710	0.77	40	813	55,156	1,851	1,101
223rd Street, I-110 to Avalon	0.87	40	122	22,468	460	274
223rd Street, Avalon to Wilmington	1.36	40	122	19,480	425	253
223rd Street, Wilmington to Alameda	1.23	40	234	13,628	300	179
W Wardlow from Alameda to I-710	0.79	40	89	18,090	345	206

TABLE 1B. NO BUILD, YEAR 2015 MSAT TRAFFIC DATA INPUTS

Road Segment	Segment Length (miles)	Posted Speed (mph)	Average Daily Trips (vehicles per day)			
			Port Trucks	Automobiles	SCAG Trucks	
					Gasoline Fuel	Diesel Fuel
SR-47 Mainline, New Dock Ramps to HF Ramps	0.75	40	15,109	11,034	26	24
Henry Ford Ramps	0.15	25	7,944	5,663	1	0
Henry Ford n/o Ramps to Alameda	0.68	25	8,952	6,841	1	0
SR-103 begin (at SR-47 /Henry Ford Junction) to Anaheim	0.95	40	7,167	5,368	26	23
SR-103 Anaheim to PCH	0.57	40	7,673	5,456	29	26
SR-103 PCH to Sepulveda/Willow	1.02	40	4,548	6,462	54	49
E and W Harry Bridges, Figueroa to start Alameda	1.44	25	4,954	11,234	73	66
Alameda beginning (E Harry Bridges) to Anaheim	0.77	35	5,031	11,910	71	65
Alameda Anaheim to Henry Ford	0.42	35	3,687	10,678	287	261
Alameda Henry Ford to PCH	0.34	35	11,552	12,037	287	262
Alameda PCH to 405	2.27	45	10,721	42,085	923	841
Alameda 405 to del Amo	1.72	45	5,053	34,000	655	597
Alameda, del Amo to South Santa Fe Avenue	0.84	45	3,567	20,740	878	459
Alameda, South Santa Fe Avenue to SR-91	1.15	45	3,372	17,430	393	358
I-110, "C" Street Interchange to Anaheim	0.49	65	14,899	118,741	1,458	1,329
I-110, Anaheim to PCH	0.80	65	15,219	121,451	1,664	1,518
1-110, PCH to Sepulveda	1.39	65	15,704	152,857	2,438	2,223
I-110, Sepulveda to Carson	1.56	65	14,617	175,067	3,314	3,023
I-110, Carson to Del Amo	1.02	65	14,112	200,384	3,800	3,465
I-110, Del Amo to 405	0.74	65	11,480	188,745	3,817	3,481
I-110, 405 to SR-91	1.09	65	9,427	207,575	4,954	4,519
I-710, Anaheim to PCH	0.50	65	44,444	114,534	1,982	1,808
I-710, PCH to Willow	1.01	65	46,513	125,067	2,280	2,080
I-710, Willow to 405	1.52	65	46,281	127,727	2,307	2,104
I-710, 405 to Del Amo	1.42	65	43,224	167,728	3,504	3,195
I-710, Del Amo to Long Beach Blvd Interchange	1.17	65	42,268	168,517	3,856	3,516

TABLE 1B. NO BUILD, YEAR 2015 MSAT TRAFFIC DATA INPUTS

Road Segment	Segment Length (miles)	Posted Speed (mph)	Average Daily Trips (vehicles per day)			
			Port Trucks	Automobiles	SCAG Trucks	
					Gasoline Fuel	Diesel Fuel
I-710, Long Beach Boulevard to SR-91	0.96	65	41,703	177,292	3,974	3,624
PCH, I110 to Alameda	2.38	50	1,003	26,594	370	338
PCH, Alameda to SR-103	0.94	50	938	18,492	206	188
PCH, SR-103 to I-710	0.98	50	5,678	18,438	190	174
Sepulveda, I-110 to Avalon	1.37	40	339	19,271	318	290
Sepulveda, Avalon to Alameda	1.70	40	196	12,651	236	215
Sepulveda, Alameda to ICTF	0.67	40	1,896	11,138	163	149
Sepulveda, ICTF to SR-103	0.17	40	4,548	7,584	128	117
Del Amo, I-110 to Wilmington	2.96	40	129	12,369	246	225
Del Amo, Wilmington to Alameda	0.77	40	1,515	32,685	896	817
Del Amo, Alameda to I-710	0.87	40	1,042	28,407	701	639
223rd Street, I-110 to Avalon	1.36	45	64	20,033	288	263
223rd Street, Avalon to Wilmington	1.23	45	59	13,782	267	243
223rd Street, Wilmington to Alameda	0.79	45	619	14,322	413	376
W Wardlow from Alameda to I-710	1.30	45	166	11,783	185	168

TABLE 1C. ALTERNATIVE 1, YEAR 2015 MSAT TRAFFIC DATA INPUTS

Road Segment	Segment Length (miles)	Posted Speed (mph)	Average Daily Trips (vehicles per day)			
			Port Trucks	Automobiles	SCAG Trucks	
					Gasoline Fuel	Diesel Fuel
SR-47 Mainline, New Dock Ramps to HF Ramps	0.38	55	22,045	24,466	173	158
Henry Ford Ramps	0.31	25	1,572	4,795	0	0
Henry Ford n/o Ramps to Alameda	0.68	25	2,880	6,146	0	0
SR-47 Extension, HF Ramps to Alameda	1.53	50	1,941	474	0	0
SR-103 begin (at SR-47 /Henry Ford Junction) to Anaheim	1.10	45	5,293	9,278	59	54
SR-103 Anaheim to PCH	0.57	45	5,806	10,719	82	74
SR-103 PCH to Sepulveda/Willow	1.02	45	4,469	14,403	163	148
E and W Harry Bridges, Figueroa to start Alameda	1.44	25	3,288	11,589	109	99
Alameda beginning (E Harry Bridges) to Anaheim	0.77	45	4,890	11,978	76	69
Alameda Anaheim to Henry Ford	0.42	45	3,603	11,861	319	290
Alameda, Henry Ford to PCH	0.34	45	20,723	22,725	433	394
Alameda PCH to 405	2.27	45	18,733	43,551	911	830
Alameda 405 to del Amo	1.72	45	6,196	24,682	480	438
Alameda, del Amo to South Santa Fe Avenue	0.84	45	4,682	20,335	865	452
Alameda, South Santa Fe Avenue to SR-91	1.15	45	4,438	17,042	382	349
I-110, "C" Street Interchange to Anaheim	0.49	65	12,841	113,925	1,407	1,284
I-110, Anaheim to PCH	0.80	65	13,204	118,707	1,635	1,492
1-110, PCH to Sepulveda	1.39	65	13,974	152,590	2,461	2,244
I-110, Sepulveda to Carson	1.56	65	13,091	175,359	3,328	3,036
I-110, Carson to Del Amo	1.02	65	12,598	200,869	3,818	3,483
I-110, Del Amo to 405	0.74	65	10,439	188,497	3,821	3,485
I-110, 405 to SR-91	1.09	65	10,249	238,892	5,958	5,434
I-710, Anaheim to PCH	0.50	65	39,908	110,727	1,924	1,754
I-710, PCH to Willow	1.01	65	40,444	122,866	2,258	2,059
I-710, Willow to 405	1.52	65	40,217	127,421	2,297	2,095
I-710, 405 to Del Amo	1.42	65	42,098	168,271	3,504	3,196

TABLE 1C. ALTERNATIVE 1, YEAR 2015 MSAT TRAFFIC DATA INPUTS

Road Segment	Segment Length (miles)	Posted Speed (mph)	Average Daily Trips (vehicles per day)			
			Port Trucks	Automobiles	SCAG Trucks	
					Gasoline Fuel	Diesel Fuel
I-710, Del Amo to Long Beach Blvd Interchange	1.17	65	41,376	169,335	3,866	3,526
I-710, Long Beach Boulevard to SR-91	0.96	65	41,078	177,257	3,969	3,620
PCH, I110 to Alameda	2.38	50	911	16,735	204	186
PCH, Alameda to SR-103	0.94	50	367	19,450	226	206
PCH, SR-103 to I-710	0.98	50	3,182	16,974	167	152
Sepulveda, I-110 to Avalon	1.37	40	300	18,992	326	297
Sepulveda, Avalon to Alameda	1.70	40	201	12,565	241	219
Sepulveda, Alameda to ICTF	0.67	40	1,410	10,584	165	150
Sepulveda, ICTF to SR-103	0.17	40	4,469	7,344	132	120
Del Amo, I-110 to Wilmington	2.96	40	110	12,432	245	224
Del Amo, Wilmington to Alameda	0.77	40	1,538	33,206	916	836
Del Amo, Alameda to I-710	0.87	40	799	42,211	962	877
223rd Street, I-110 to Avalon	1.36	45	71	20,029	287	262
223rd Street, Avalon to Wilmington	1.23	45	56	14,274	266	242
223rd Street, Wilmington to Alameda	0.79	45	1,173	15,154	421	384
W Wardlow from Alameda to I-710	1.30	45	829	10,649	263	240

TABLE 1D. ALTERNATIVE 2, YEAR 2015 MSAT TRAFFIC DATA INPUTS

Road Segment	Segment Length (miles)	Posted Speed (mph)	Average Daily Trips (vehicles per day)			
			Port Trucks	Automobiles	SCAG Trucks	
					Gasoline Fuel	Diesel Fuel
SR-47 Mainline, New Dock Ramps to HF Ramps	0.65	55	19,633	19,244	94	85
Henry Ford Ramps	0.24	25	2,396	5,588	3	3
Henry Ford n/o Ramps to Alameda	0.68	25	2,764	696	4	4
SR-103 begin (at SR-47 /Henry Ford Junction) to Anaheim	1.04	55	17,236	13,659	90	83
SR-103 Anaheim to PCH	0.57	55	18,223	18,089	145	132
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	0.47	55	11,557	12,346	185	168
SR-103 Ramps south of Sepulveda/Willow	0.37	55	4,196	13,372	131	120
SR-103, Realignment to End (223rd/Wardlow)	1.85	50	16,363	50,967	1,049	957
E and W Harry Bridges, Figueroa to start Alameda	1.44	25	3,157	11,597	110	101
Alameda beginning (E Harry Bridges) to Anaheim	0.77	35	5,784	22,205	313	285
Alameda Anaheim to Henry Ford	0.42	35	3,942	11,505	317	290
Alameda, Henry Ford to PCH	0.34	35	6,707	12,198	322	293
Alameda PCH to 405	2.27	45	4,807	38,462	860	784
Alameda 405 to del Amo	1.72	45	6,429	25,199	491	448
Alameda, del Amo to South Santa Fe Avenue	0.84	45	4,672	21,300	886	463
Alameda, South Santa Fe Avenue to SR-91	1.15	45	4,108	17,930	748	391
I-110, "C" Street Interchange to Anaheim	0.49	65	12,874	115,091	1,402	1,279
I-110, Anaheim to PCH	0.80	65	13,227	118,882	1,623	1,481
1-110, PCH to Sepulveda	1.39	65	13,841	151,893	2,433	2,219
I-110, Sepulveda to Carson	1.56	65	12,884	174,567	3,313	3,021
I-110, Carson to Del Amo	1.02	65	12,416	200,611	3,812	3,476
I-110, Del Amo to 405	0.74	65	10,251	188,206	3,805	3,471
I-110, 405 to SR-91	1.09	65	8,759	207,979	4,978	4,541
I-710, Anaheim to PCH	0.50	65	41,356	112,326	1,970	1,797
I-710, PCH to Willow	1.01	65	43,159	122,653	2,254	2,055
I-710, Willow to 405	1.52	65	42,926	126,607	2,288	2,087

TABLE 1D. ALTERNATIVE 2, YEAR 2015 MSAT TRAFFIC DATA INPUTS

Road Segment	Segment Length (miles)	Posted Speed (mph)	Average Daily Trips (vehicles per day)			
			Port Trucks	Automobiles	SCAG Trucks	
					Gasoline Fuel	Diesel Fuel
I-710, 405 to Del Amo	1.42	65	42,186	168,254	3,470	3,164
I-710, Del Amo to Long Beach Blvd Interchange	1.17	65	41,734	169,110	3,829	3,493
I-710, Long Beach Boulevard to SR-91	0.96	65	41,470	177,538	3,942	3,596
PCH, I-110 to Alameda	2.38	50	864	23,406	297	271
PCH, Alameda to SR-103	0.94	50	353	17,366	195	177
PCH, SR-103 to I-710	0.98	50	4,510	17,480	179	163
Sepulveda, I-110 to Avalon	1.37	40	290	19,113	323	295
Sepulveda, Avalon to Alameda	1.70	40	165	12,455	208	189
Sepulveda, Alameda to ICTF	0.67	40	1,155	10,067	132	120
Sepulveda, ICTF to SR-103	0.17	40	4,196	6,757	95	87
Del Amo, I-110 to Wilmington	2.96	40	110	12,308	244	223
Del Amo, Wilmington to Alameda	0.77	40	1,518	32,393	893	814
Del Amo, Alameda to I-710	0.87	40	839	27,842	693	633
223rd Street, I-110 to Avalon	1.36	45	90	19,709	276	252
223rd Street, Avalon to Wilmington	1.23	45	105	14,290	258	236
223rd Street, Wilmington to Alameda	0.79	45	1,222	14,504	413	376
W Wardlow from Alameda to I-710	1.30	45	1,317	10,662	264	241

TABLE 1E. NO BUILD, YEAR 2030 MSAT TRAFFIC DATA INPUTS

Road Segment	Segment Length (miles)	Posted Speed (mph)	Average Daily Trips (vehicles per day)			
			Port Trucks	Automobiles	SCAG Trucks	
					Gasoline Fuel	Diesel Fuel
SR-47 Mainline, New Dock Ramps to HF Ramps	0.75	40	29,370	16,328	36	33
Henry Ford Ramps	0.15	25	10,859	7,181	1	0
Henry Ford n/o Ramps to Alameda	0.68	25	14,347	9,382	119	111
SR-103 begin (at SR-47 /Henry Ford Junction) to Anaheim	0.95	40	18,512	9,144	34	32
SR-103 Anaheim to PCH	0.57	40	17,374	11,453	81	76
SR-103 PCH to Sepulveda/Willow	1.02	40	11,605	13,443	115	107
E and W Harry Bridges, Figueroa to start Alameda	1.44	25	6,078	15,557	141	131
Alameda beginning (E Harry Bridges) to Anaheim	0.77	35	7,076	24,775	327	303
Alameda Anaheim to Henry Ford	0.42	35	4,433	11,304	311	288
Alameda Henry Ford to PCH	0.34	35	16,015	12,403	310	287
Alameda PCH to 405	2.27	45	17,357	46,881	1,056	979
Alameda 405 to del Amo	1.72	45	10,022	43,124	961	890
Alameda, del Amo to South Santa Fe Avenue	0.84	45	7,232	29,565	1,311	680
Alameda, South Santa Fe Avenue to SR-91	1.15	45	5,629	22,466	985	511
I-110, "C" Street Interchange to Anaheim	0.49	65	19,966	136,693	1,764	1,634
I-110, Anaheim to PCH	0.80	65	20,290	137,781	1,983	1,838
1-110, PCH to Sepulveda	1.39	65	20,706	167,600	2,767	2,565
I-110, Sepulveda to Carson	1.56	65	19,197	207,199	4,140	3,836
I-110, Carson to Del Amo	1.02	65	18,392	214,674	4,306	3,991
I-110, Del Amo to 405	0.74	65	17,738	227,995	4,915	4,555
I-110, 405 to SR-91	1.09	65	14,615	257,149	7,036	6,520
I-710, Anaheim to PCH	0.50	65	71,248	113,489	2,181	2,021
I-710, PCH to Willow	1.01	65	72,139	118,558	2,333	2,163
I-710, Willow to 405	1.52	65	71,804	122,715	2,373	2,200
I-710, 405 to Del Amo	1.42	65	67,615	168,842	3,792	3,514
I-710, Del Amo to Long Beach Blvd Interchange	1.17	65	66,070	169,420	4,152	3,848

TABLE 1E. NO BUILD, YEAR 2030 MSAT TRAFFIC DATA INPUTS

Road Segment	Segment Length (miles)	Posted Speed (mph)	Average Daily Trips (vehicles per day)			
			Port Trucks	Automobiles	SCAG Trucks	
					Gasoline Fuel	Diesel Fuel
I-710, Long Beach Boulevard to SR-91	0.96	65	65,231	218,049	6,224	5,769
PCH, I110 to Alameda	2.38	50	3,105	42,512	761	706
PCH, Alameda to SR-103	0.94	50	2,634	23,667	296	274
PCH, SR-103 to I-710	0.98	50	19,563	25,904	445	413
Sepulveda, I-110 to Avalon	1.37	40	587	25,893	435	403
Sepulveda, Avalon to Alameda	1.70	40	623	25,952	529	490
Sepulveda, Alameda to ICTF	0.67	40	5,004	10,818	167	155
Sepulveda, ICTF to SR-103	0.17	40	11,605	7,191	129	120
Del Amo, I-110 to Wilmington	2.96	40	423	24,830	465	431
Del Amo, Wilmington to Alameda	0.77	40	1,918	36,806	1,039	963
Del Amo, Alameda to I-710	0.87	40	1,529	48,649	1,142	1,059
223rd Street, I-110 to Avalon	1.36	45	151	25,206	386	358
223rd Street, Avalon to Wilmington	1.23	45	105	17,782	311	288
223rd Street, Wilmington to Alameda	0.79	45	1,227	20,883	590	546
W Wardlow from Alameda to I-710	1.30	45	3,672	36,501	775	718

TABLE 1F. ALTERNATIVE 1, YEAR 2030 MSAT TRAFFIC DATA INPUTS

Road Segment	Segment Length (miles)	Posted Speed (mph)	Average Daily Trips (vehicles per day)			
			Port Trucks	Automobiles	SCAG Trucks	
					Gasoline Fuel	Diesel Fuel
SR-47 Mainline, New Dock Ramps to HF Ramps	0.38	55	35,585	27,767	169	157
Henry Ford Ramps	0.31	25	15,449	19,285	153	142
Henry Ford n/o Ramps to Alameda	0.68	25	7,291	10,068	153	141
SR-47 Extension, HF Ramps to Alameda	1.53	50	20,135	8,473	87	81
SR-103 begin (at SR-47 /Henry Ford Junction) to Anaheim	1.10	50	12,798	12,978	83	76
SR-103 Anaheim to PCH	0.57	50	15,192	16,446	153	141
SR-103 PCH to Sepulveda/Willow	1.02	50	9,893	20,388	241	223
E and W Harry Bridges, Figueroa to start Alameda	1.44	25	5,648	15,143	136	126
Alameda beginning (E Harry Bridges) to Anaheim	0.77	45	6,680	25,372	340	316
Alameda Anaheim to Henry Ford	0.42	45	3,932	13,135	358	332
Alameda, Henry Ford to PCH	0.34	45	28,664	22,990	452	419
Alameda PCH to 405	2.27	45	26,331	42,779	958	887
Alameda 405 to del Amo	1.72	45	12,397	41,554	921	854
Alameda, del Amo to South Santa Fe Avenue	0.84	45	8,964	27,756	1,204	625
Alameda, South Santa Fe Avenue to SR-91	1.15	45	7,052	21,886	941	488
I-110, "C" Street Interchange to Anaheim	0.49	65	17,957	132,562	1,718	1,592
I-110, Anaheim to PCH	0.80	65	18,233	134,584	1,933	1,791
1-110, PCH to Sepulveda	1.39	65	19,172	167,512	2,771	2,568
I-110, Sepulveda to Carson	1.56	65	17,829	208,028	4,159	3,855
I-110, Carson to Del Amo	1.02	65	17,107	215,598	4,327	4,010
I-110, Del Amo to 405	0.74	65	16,544	228,689	4,919	4,559
I-110, 405 to SR-91	1.09	65	14,181	257,876	7,040	6,525
I-710, Anaheim to PCH	0.50	65	64,390	113,993	2,202	2,041
I-710, PCH to Willow	1.01	65	65,329	119,873	2,356	2,184
I-710, Willow to 405	1.52	65	64,978	126,049	2,431	2,253
I-710, 405 to Del Amo	1.42	65	65,306	171,458	3,848	3,566

TABLE 1F. ALTERNATIVE 1, YEAR 2030 MSAT TRAFFIC DATA INPUTS

Road Segment	Segment Length (miles)	Posted Speed (mph)	Average Daily Trips (vehicles per day)			
			Port Trucks	Automobiles	SCAG Trucks	
					Gasoline Fuel	Diesel Fuel
I-710, Del Amo to Long Beach Blvd Interchange	1.17	65	64,177	170,964	4,186	3,880
I-710, Long Beach Boulevard to SR-91	0.96	65	63,776	217,092	6,125	5,677
PCH, I110 to Alameda	2.38	50	3,439	39,410	631	584
PCH, Alameda to SR-103	0.94	50	1,032	25,720	338	314
PCH, SR-103 to I-710	0.98	50	8,461	26,565	436	405
Sepulveda, I-110 to Avalon	1.37	40	584	25,720	415	384
Sepulveda, Avalon to Alameda	1.70	40	688	25,453	510	473
Sepulveda, Alameda to ICTF	0.67	40	2,838	10,843	176	164
Sepulveda, ICTF to SR-103	0.17	40	9,893	7,282	141	130
Del Amo, I-110 to Wilmington	2.96	40	387	24,434	461	428
Del Amo, Wilmington to Alameda	0.77	40	1,931	36,144	1,018	943
Del Amo, Alameda to I-710	0.87	40	1,274	47,972	1,136	1,053
223rd Street, I-110 to Avalon	1.36	45	196	25,122	402	373
223rd Street, Avalon to Wilmington	1.23	45	103	17,431	306	284
223rd Street, Wilmington to Alameda	0.79	45	1,776	20,968	600	557
W Wardlow from Alameda to I-710	1.30	45	6,325	36,001	740	686

TABLE 1F. ALT ERNATIVE 2, YEAR 2030 MSAT TRAFFIC DATA INPUTS

Road Segment	Segment Length (miles)	Posted Speed (mph)	Average Daily Trips (vehicles per day)			
			Port Trucks	Automobiles	SCAG Trucks	
					Gasoline Fuel	Diesel Fuel
SR-47 Mainline, New Dock Ramps to HF Ramps	0.65	55	35,337	23,431	89	83
Henry Ford Ramps	0.24	25	5,135	7,460	6	5
Henry Ford n/o Ramps to Alameda	0.68	25	9,277	9,126	139	128
SR-103 begin (at SR-47 /Henry Ford Junction) to Anaheim	1.04	55	30,197	15,964	84	78
SR-103 Anaheim to PCH	0.57	55	33,721	23,847	226	210
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	0.47	55	29,585	30,198	393	364
SR-103 Ramps south of Sepulveda/Willow	0.37	55	20,517	12,267	206	191
SR-103, Realignment to End (223rd/Wardlow)	1.85	50	9,069	17,931	188	174
E and W Harry Bridges, Figueroa to start Alameda	1.44	25	5,918	14,945	136	127
Alameda beginning (E Harry Bridges) to Anaheim	0.77	35	6,942	24,731	324	301
Alameda Anaheim to Henry Ford	0.42	35	4,259	12,339	331	307
Alameda, Henry Ford to PCH	0.34	35	10,747	13,285	337	313
Alameda PCH to 405	2.27	45	27,598	55,292	1,197	1,110
Alameda 405 to del Amo	1.72	45	13,654	41,709	923	855
Alameda, del Amo to South Santa Fe Avenue	0.84	45	9,415	29,716	1,309	679
Alameda, South Santa Fe Avenue to SR-91	1.15	45	7,280	23,624	1,038	539
I-110, "C" Street Interchange to Anaheim	0.49	65	17,532	132,764	1,709	1,584
I-110, Anaheim to PCH	0.80	65	17,838	135,680	1,958	1,814
1-110, PCH to Sepulveda	1.39	65	18,532	167,211	2,774	2,571
I-110, Sepulveda to Carson	1.56	65	17,174	208,207	4,162	3,857
I-110, Carson to Del Amo	1.02	65	16,415	216,230	4,342	4,025
I-110, Del Amo to 405	0.74	65	15,889	229,039	4,955	4,592
I-110, 405 to SR-91	1.09	65	13,577	258,623	7,113	6,592
I-710, Anaheim to PCH	0.50	65	64,694	115,945	2,201	2,039
I-710, PCH to Willow	1.01	65	64,713	121,538	2,394	2,218
I-710, Willow to 405	1.52	65	64,376	126,938	2,451	2,272

TABLE 1F. ALT ERNATIVE 2, YEAR 2030 MSAT TRAFFIC DATA INPUTS

Road Segment	Segment Length (miles)	Posted Speed (mph)	Average Daily Trips (vehicles per day)			
			Port Trucks	Automobiles	SCAG Trucks	
					Gasoline Fuel	Diesel Fuel
I-710, 405 to Del Amo	1.42	65	64,701	170,564	3,715	3,443
I-710, Del Amo to Long Beach Blvd Interchange	1.17	65	64,698	170,006	4,018	3,723
I-710, Long Beach Boulevard to SR-91	0.96	65	64,411	216,007	5,948	5,512
PCH, I-110 to Alameda	2.38	50	3,071	40,452	713	661
PCH, Alameda to SR-103	0.94	50	747	23,473	296	274
PCH, SR-103 to I-710	0.98	50	7,366	28,355	502	466
Sepulveda, I-110 to Avalon	1.37	40	535	26,102	430	398
Sepulveda, Avalon to Alameda	1.70	40	516	26,227	526	487
Sepulveda, Alameda to ICTF	0.67	40	1,800	11,557	169	157
Sepulveda, ICTF to SR-103	0.17	40	9,069	7,711	131	122
Del Amo, I-110 to Wilmington	2.96	40	340	24,862	462	429
Del Amo, Wilmington to Alameda	0.77	40	1,906	35,888	1,018	944
Del Amo, Alameda to I-710	0.87	40	2,323	46,310	1,064	986
223rd Street, I-110 to Avalon	1.36	45	205	24,278	383	355
223rd Street, Avalon to Wilmington	1.23	45	185	17,354	332	308
223rd Street, Wilmington to Alameda	0.79	45	2,443	19,665	563	522
W Wardlow from Alameda to I-710	1.30	45	5,534	35,615	731	678

Currently, significance criteria have not been established to evaluate the significance of air toxic emissions from individual transportation projects. Therefore, the following discussion of MSAT results will be a comparison of emissions by alternative rather than a discussion of the specific values.

Results

The MSAT emissions by alternative and year are presented in Table 2. The detailed MSAT emissions for each alternative, year, and road segment are presented in Tables 3a through 3g. As shown in Table 2, the MSAT emissions would be predicted to decrease over time, even though the traffic volumes and percentage of diesel trucks are expected to increase in time. The decrease in MSAT emissions for the alternatives analyzed is consistent with the EPA's projections that MSAT emissions will decrease over the next 15 years. However, the MSAT analysis shows a slight increase in diesel particulate matter emissions in the year 2030 when compared to the year 2015. This increase is due to aging of the truck fleet because it was assumed the port trucks would have model year 2007 or newer engines. In the year 2015, a model year 2007 engine would only be 8 years old. However, by the year 2030, trucks with model year 2007 engines would have aged to 23 years old. The aging of the truck fleet results in the higher emission factors in 2030 compared to 2015.

The MSAT emissions summarized by road segment in Tables 3b through 3g were also evaluated by comparing the Build Alternative emissions to the No Build Alternative emissions by segment. For both Alternative 1 and Alternative 2, the MSAT emissions for each segment would be less than the existing condition. The following paragraphs summarize the comparison for the years 2015 and 2030.

For the year 2015, comparing Alternative 1 to the No Build Alternative (Tables 3b and 3c), the road segment Alameda PCH to 405 would result in the highest incremental increase in DPM emissions. For this same scenario, the highest emissions of the other five MSATs would be along the I-110 and I-710 segments. However, DPM emissions would be expected to decrease along the I-110 segments and along I-710 segments. Alternatively, for the year 2015, comparing Alternative 2 to the No Build Alternative (Tables 3b and 3d), the road segments along SR-103 would result in the highest incremental increase in DPM emissions for Alternative 2. Similar to Alternative 1, the highest emissions of the other five MSATs for Alternative 2 would be along the I-110 segments and I-710 segments while DPM emissions would be expected to decrease along the I-110 segments and along the I-710 segments.

For the year 2030 comparing Alternative 1 to the No Build Alternative (Tables 3e and 3f), the road segments SR-47 Extension, HF Ramps to Alameda and Alameda PCH to 405 would result in the highest incremental increase in DPM emissions under Alternative 1. For this same scenario, the emissions of the other five MSATs would be expected to be similar to the No Build Alternative. Alternatively, for the year 2030, comparing Alternative 2 to the No Build Alternative (Tables 3e and 3g), the road segments along SR-103 and Alameda PCH to 405 would result in the highest incremental increase in DPM emissions for Alternative 2. Similar to Alternative 1, the highest emissions of the other five MSATs for Alternative 2 would be similar to the No Build Alternative.

TABLE 2
MSAT Emissions Summary

		Emissions (lbs/day)					
Year	**Scenario**	**Diesel PM**	**Benzene**	**1,3-Butadiene**	**Acetaldehyde**	**Acrolein**	**Formaldehyde**
2003	**No Build**	828	70	16	14	4	53
2015	**No Build**	95	12	3	2	1	10
	Alternative 1	94	12	3	2	1	10
	Alternative 2	91	12	3	2	1	10
2030	**No Build**	128	3	1	0.4	0.2	4
	Alternative 1	127	3	1	0.4	0.2	4
	Alternative 2	128	3	1	0.4	0.2	4

TABLE 3A. EXISTING (YEAR 2003) MSAT EMISSIONS

Road Segment	Emissions (lb/day)					
	DPM	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
SR-47 Mainline, New Dock Ramps to HF Ramps	16.43	0.08	0.06	0.02	0.02	<0.01
Henry Ford Ramps	1.58	0.01	0.01	<0.01	<0.01	<0.01
Henry Ford n/o Ramps to Alameda	8.36	0.19	0.14	0.04	0.04	0.01
SR-103 begin (at SR-47 /Henry Ford Junction) to Anaheim	13.06	0.05	0.04	0.01	0.01	<0.01
SR-103 Anaheim to PCH	8.48	0.03	0.02	0.01	0.01	<0.01
SR-103 PCH to Sepulveda/Willow	10.95	0.04	0.03	0.01	0.01	<0.01
E and W Harry Bridges, Figueroa to start Alameda	8.47	0.37	0.28	0.09	0.07	0.02
Alameda beginning (E Harry Bridges) to Anaheim	4.50	0.26	0.20	0.06	0.05	0.01
Alameda Anaheim to Henry Ford	1.65	0.10	0.08	0.02	0.02	0.01
Alameda Henry Ford to PCH	4.25	0.12	0.09	0.03	0.02	0.01
Alameda PCH to 405	17.10	2.11	1.59	0.49	0.41	0.11
Alameda 405 to del Amo	5.51	1.22	0.92	0.28	0.24	0.07
Alameda, Del Amo to South Santa Fe Avenue	2.51	0.44	0.33	0.10	0.08	0.02
Alameda, South Santa Fe Ave to SR-91	2.74	0.88	0.66	0.20	0.17	0.05
I-110, "C" Street Interchange to Anaheim	15.06	1.33	1.01	0.31	0.26	0.07
I-110, Anaheim to PCH	24.71	2.37	1.79	0.55	0.46	0.13
1-110, PCH to Sepulveda	43.45	5.26	3.96	1.22	1.02	0.28
I-110, Sepulveda to Carson	47.57	6.92	5.22	1.61	1.34	0.37
I-110, Carson to Del Amo	30.60	5.22	3.94	1.21	1.01	0.28
I-110, Del Amo to 405	22.00	4.04	3.05	0.94	0.78	0.22
I-110, 405 to SR-91	30.33	6.80	5.13	1.58	1.32	0.37
I-710, Anaheim to PCH	34.65	1.32	0.99	0.31	0.26	0.07
I-710, PCH to Willow	76.18	3.04	2.29	0.71	0.59	0.16
I-710, Willow to 405	115.45	4.91	3.70	1.14	0.95	0.26
I-710, 405 to Del Amo	98.25	6.34	4.78	1.47	1.23	0.34
I-710, Del Amo to Long Beach Blvd Interchange	78.95	5.24	3.95	1.22	1.02	0.28
I-710, Long Beach Boulevard to SR-91	64.00	4.59	3.46	1.07	0.89	0.25
PCH-110 to Alameda	3.53	1.65	1.25	0.38	0.32	0.09
PCH, Alameda to SR-103	0.87	0.33	0.25	0.08	0.06	0.02

TABLE 3A. EXISTING (YEAR 2003) MSAT EMISSIONS

Road Segment	Emissions (lb/day)					
	DPM	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
PCH, SR-103 to I-710	8.12	0.56	0.42	0.13	0.11	0.03
Sepulveda, I-110 to Avalon	0.84	0.65	0.49	0.15	0.13	0.04
Sepulveda, Avalon to Alameda	1.21	0.68	0.51	0.16	0.13	0.04
Sepulveda, Alameda to ICTF	1.75	0.27	0.20	0.06	0.05	0.01
Sepulveda, ICTF to SR-103	1.87	0.07	0.05	0.02	0.01	<0.01
Del Amo, Wilmington to Alameda	0.66	<0.01	<0.01	<0.01	<0.01	<0.01
Del Amo, Alameda to I-710	2.54	0.32	0.24	0.08	0.06	0.02
223rd Street, I-110 to Avalon	0.78	0.95	0.72	0.22	0.19	0.05
223rd Street, Avalon to Wilmington	0.67	0.56	0.42	0.13	0.11	0.03
223rd Street, Wilmington to Alameda	0.53	0.44	0.33	0.10	0.09	0.02
W Wardlow from Alameda to I-710	0.55	0.20	0.15	0.05	0.04	0.01

TABLE 3B. NO BUILD, 2015 MSAT EMISSIONS

Road Segment	Emissions (lb/day)					
	DPM	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
SR-47 Mainline, New Dock Ramps to HF Ramps	0.99	0.03	0.07	0.01	0.01	<0.01
Henry Ford Ramps	0.09	<0.01	0.01	<0.01	<0.01	<0.01
Henry Ford n/o Ramps to Alameda	0.46	0.03	0.04	0.01	<0.01	<0.01
SR-103 begin (at SR-47 /Henry Ford Junction) to Anaheim	0.60	0.02	0.04	<0.01	<0.01	<0.01
SR-103 Anaheim to PCH	0.41	0.01	0.03	<0.01	<0.01	<0.01
SR-103 PCH to Sepulveda/Willow	0.42	0.02	0.03	<0.01	<0.01	<0.01
E and W Harry Bridges, Figueroa to start Alameda	0.60	0.06	0.07	0.01	0.01	<0.01
Alameda beginning (E Harry Bridges) to Anaheim	0.41	0.07	0.06	0.01	0.01	<0.01
Alameda Anaheim to Henry Ford	0.15	0.02	0.02	<0.01	<0.01	<0.01
Alameda Henry Ford to PCH	0.34	0.02	0.03	<0.01	<0.01	<0.01
Alameda PCH to 405	3.05	0.33	0.33	0.07	0.05	0.02
Alameda 405 to del Amo	1.33	0.20	0.18	0.04	0.03	0.01
Alameda, del Amo to South Santa Fe Avenue	0.39	0.06	0.05	0.01	0.01	<0.01
Alameda, South Santa Fe Avenue to SR-91	0.49	0.07	0.06	0.01	0.01	<0.01
I-110, "C" Street Interchange to Anaheim	1.50	0.24	0.20	0.05	0.04	0.01
I-110, Anaheim to PCH	2.55	0.41	0.33	0.09	0.07	0.02
1-110, PCH to Sepulveda	4.94	0.89	0.71	0.20	0.14	0.05
I-110, Sepulveda to Carson	5.80	1.15	0.89	0.26	0.18	0.06
I-110, Carson to Del Amo	3.91	0.86	0.66	0.19	0.14	0.05
I-110, Del Amo to 405	2.52	0.59	0.45	0.13	0.09	0.03
I-110, 405 to SR-91	4.47	1.11	0.82	0.25	0.18	0.06
I-710, Anaheim to PCH	4.07	0.25	0.26	0.05	0.04	0.01
I-710, PCH to Willow	8.66	0.55	0.56	0.12	0.09	0.03
I-710, Willow to 405	13.08	0.85	0.87	0.18	0.14	0.04
I-710, 405 to Del Amo	12.14	1.03	0.96	0.23	0.17	0.05
I-710, Del Amo to Long Beach Blvd Interchange	10.01	0.86	0.79	0.19	0.14	0.04
I-710, Long Beach Boulevard to SR-91	8.15	0.74	0.67	0.16	0.12	0.04
PCH, I110 to Alameda	0.94	0.29	0.22	0.06	0.05	0.02

TABLE 3B. NO BUILD, 2015 MSAT EMISSIONS

Road Segment	Emissions (lb/day)					
	DPM	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
PCH, Alameda to SR-103	0.15	0.05	0.04	0.01	0.01	<0.01
PCH, SR-103 to I-710	0.72	0.08	0.08	0.02	0.01	<0.01
Sepulveda, I-110 to Avalon	0.14	0.09	0.07	0.02	0.01	<0.01
Sepulveda, Avalon to Alameda	0.13	0.07	0.05	0.02	0.01	<0.01
Sepulveda, Alameda to ICTF	0.14	0.03	0.02	0.01	<0.01	<0.01
Sepulveda, ICTF to SR-103	0.07	0.00	0.01	<0.01	<0.01	<0.01
Del Amo, I-110 to Wilmington	0.21	0.13	0.09	0.03	0.02	0.01
Del Amo, Wilmington to Alameda	0.27	0.09	0.07	0.02	0.01	<0.01
Del Amo, Alameda to I-710	0.23	0.09	0.06	0.02	0.01	<0.01
223rd Street, I-110 to Avalon	0.11	0.09	0.06	0.02	0.01	<0.01
223rd Street, Avalon to Wilmington	0.09	0.05	0.04	0.01	0.01	<0.01
223rd Street, Wilmington to Alameda	0.13	0.04	0.03	0.01	0.01	<0.01
W Wardlow from Alameda to I-710	0.08	0.05	0.04	0.01	0.01	<0.01

TABLE 3C. ALTERNATIVE 1, 2015 MSAT EMISSIONS

Road Segment	Emissions (lb/day)					
	DPM	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
SR-47 Mainline, New Dock Ramps to HF Ramps	1.26	0.04	0.07	0.01	0.01	<0.01
Henry Ford Ramps	0.04	0.01	0.01	<0.01	<0.01	<0.01
Henry Ford n/o Ramps to Alameda	0.15	0.02	0.02	<0.01	<0.01	<0.01
SR-47 Extension, HF Ramps to Alameda	2.60	0.06	0.13	0.01	0.01	<0.01
SR-103 begin (at SR-47 /Henry Ford Junction) to Anaheim	0.58	0.04	0.05	0.01	0.01	<0.01
SR-103 Anaheim to PCH	0.37	0.02	0.03	<0.01	<0.01	<0.01
SR-103 PCH to Sepulveda/Willow	0.48	0.05	0.05	0.01	0.01	<0.01
E and W Harry Bridges, Figueroa to start Alameda	0.50	0.06	0.06	0.01	0.01	<0.01
Alameda beginning (E Harry Bridges) to Anaheim	0.48	0.06	0.06	0.01	0.01	<0.01
Alameda Anaheim to Henry Ford	0.18	0.02	0.02	<0.01	<0.01	<0.01
Alameda, Henry Ford to PCH	0.21	0.02	0.02	<0.01	<0.01	<0.01
Alameda PCH to 405	4.84	0.35	0.41	0.07	0.06	0.02
Alameda 405 to del Amo	1.56	0.20	0.19	0.04	0.03	0.01
Alameda, del Amo to South Santa Fe Avenue	0.48	0.06	0.06	0.01	0.01	<0.01
Alameda, South Santa Fe Avenue to SR-91	0.61	0.07	0.07	0.01	0.01	<0.01
I-110, "C" Street Interchange to Anaheim	1.32	0.23	0.19	0.05	0.04	0.01
I-110, Anaheim to PCH	2.27	0.40	0.32	0.09	0.06	0.02
1-110, PCH to Sepulveda	4.55	0.89	0.70	0.20	0.14	0.05
I-110, Sepulveda to Carson	5.41	1.15	0.89	0.26	0.18	0.06
I-110, Carson to Del Amo	3.66	0.86	0.65	0.19	0.14	0.05
I-110, Del Amo to 405	2.39	0.59	0.44	0.13	0.09	0.03
I-110, 405 to SR-91	4.40	1.11	0.82	0.25	0.18	0.06
I-710, Anaheim to PCH	3.69	0.24	0.25	0.05	0.04	0.01
I-710, PCH to Willow	7.64	0.54	0.53	0.12	0.09	0.03
I-710, Willow to 405	11.54	0.84	0.83	0.18	0.14	0.04
I-710, 405 to Del Amo	11.87	1.03	0.95	0.23	0.17	0.05
I-710, Del Amo to Long Beach Blvd Interchange	9.84	0.86	0.79	0.19	0.14	0.04
I-710, Long Beach Boulevard to SR-91	8.05	0.74	0.67	0.16	0.12	0.04
PCH, I110 to Alameda	0.90	0.27	0.21	0.06	0.04	0.01

TABLE 3C. ALTERNATIVE 1, 2015 MSAT EMISSIONS

Road Segment	Emissions (lb/day)					
	DPM	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
PCH, Alameda to SR-103	0.10	0.06	0.04	0.01	0.01	<0.01
PCH, SR-103 to I-710	0.39	0.05	0.05	0.01	0.01	<0.01
Sepulveda, I-110 to Avalon	0.14	0.09	0.06	0.02	0.01	<0.01
Sepulveda, Avalon to Alameda	0.13	0.07	0.05	0.02	0.01	<0.01
Sepulveda, Alameda to ICTF	0.11	0.02	0.02	0.01	<0.01	<0.01
Sepulveda, ICTF to SR-103	0.07	<0.01	0.01	<0.01	<0.01	<0.01
Del Amo, I-110 to Wilmington	0.20	0.13	0.09	0.03	0.02	0.01
Del Amo, Wilmington to Alameda	0.27	0.09	0.07	0.02	0.01	<0.01
Del Amo, Alameda to I-710	0.26	0.13	0.09	0.03	0.02	0.01
223rd Street, I-110 to Avalon	0.11	0.09	0.06	0.02	0.01	<0.01
223rd Street, Avalon to Wilmington	0.09	0.06	0.04	0.01	0.01	<0.01
223rd Street, Wilmington to Alameda	0.17	0.04	0.03	0.01	0.01	<0.01
W Wardlow from Alameda to I-710	0.19	0.05	0.04	0.01	0.01	<0.01

TABLE 3D. ALTERNATIVE 2, 2015 MSAT EMISSIONS

Road Segment	Emissions (lb/day)					
	DPM	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
SR-47 Mainline, New Dock Ramps to HF Ramps	1.62	0.05	0.08	0.01	0.01	<0.01
Henry Ford Ramps	0.04	0.01	0.01	<0.01	<0.01	<0.01
Henry Ford n/o Ramps to Alameda	0.14	<0.01	0.01	<0.01	<0.01	<0.01
SR-103 begin (at SR-47 /Henry Ford Junction) to Anaheim	2.28	0.06	0.11	0.01	0.01	<0.01
SR-103 Anaheim to PCH	1.38	0.04	0.07	0.01	0.01	<0.01
SR-103 PCH to Realignment (Sepulveda/Willow ramps)	0.97	0.04	0.06	0.01	0.01	<0.01
SR-103 Ramps south of Sepulveda/Willow	0.21	0.02	0.02	<0.01	<0.01	<0.01
SR-103, Realignment to End (223rd/Wardlow)	2.43	0.08	0.14	0.02	0.01	<0.01
E and W Harry Bridges, Figueroa to start Alameda	0.40	0.06	0.06	0.01	0.01	<0.01
Alameda beginning (E Harry Bridges) to Anaheim	0.40	0.07	0.06	0.01	0.01	<0.01
Alameda Anaheim to Henry Ford	0.16	0.02	0.02	<0.01	<0.01	<0.01
Alameda, Henry Ford to PCH	0.21	0.02	0.02	<0.01	<0.01	<0.01
Alameda PCH to 405	1.69	0.29	0.26	0.07	0.05	0.02
Alameda 405 to del Amo	1.53	0.20	0.19	0.04	0.03	0.01
Alameda, del Amo to South Santa Fe Avenue	0.46	0.06	0.06	0.01	0.01	<0.01
Alameda, South Santa Fe Avenue to SR-91	0.55	0.07	0.07	0.02	0.01	<0.01
I-110, "C" Street Interchange to Anaheim	1.26	0.24	0.19	0.05	0.04	0.01
I-110, Anaheim to PCH	2.16	0.40	0.32	0.09	0.06	0.02
1-110, PCH to Sepulveda	4.22	0.88	0.69	0.20	0.14	0.05
I-110, Sepulveda to Carson	4.91	1.14	0.88	0.26	0.18	0.06
I-110, Carson to Del Amo	3.30	0.86	0.65	0.19	0.14	0.05
I-110, Del Amo to 405	2.12	0.59	0.44	0.13	0.09	0.03
I-110, 405 to SR-91	3.81	1.11	0.82	0.25	0.18	0.06
I-710, Anaheim to PCH	3.73	0.24	0.25	0.05	0.04	0.01
I-710, PCH to Willow	7.90	0.54	0.54	0.12	0.09	0.03
I-710, Willow to 405	11.93	0.84	0.84	0.18	0.14	0.04
I-710, 405 to Del Amo	11.45	1.03	0.95	0.23	0.17	0.05
I-710, Del Amo to Long Beach Blvd Interchange	9.51	0.86	0.79	0.19	0.14	0.04
I-710, Long Beach Boulevard to SR-91	7.78	0.74	0.67	0.16	0.12	0.04

TABLE 3D. ALTERNATIVE 2, 2015 MSAT EMISSIONS

Road Segment	Emissions (lb/day)					
	DPM	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
PCH, I-110 to Alameda	0.79	0.26	0.20	0.06	0.04	0.01
PCH, Alameda to SR-103	0.08	0.05	0.04	0.01	0.01	<0.01
PCH, SR-103 to I-710	0.53	0.06	0.06	0.01	0.01	<0.01
Sepulveda, I-110 to Avalon	0.12	0.09	0.06	0.02	0.01	<0.01
Sepulveda, Avalon to Alameda	0.09	0.07	0.05	0.02	0.01	<0.01
Sepulveda, Alameda to ICTF	0.08	0.02	0.02	0.01	<0.01	<0.01
Sepulveda, ICTF to SR-103	0.07	<0.01	0.01	<0.01	<0.01	<0.01
Del Amo, I-110 to Wilmington	0.16	0.13	0.09	0.03	0.02	0.01
Del Amo, Wilmington to Alameda	0.23	0.09	0.07	0.02	0.01	<0.01
Del Amo, Alameda to I-710	0.18	0.09	0.06	0.02	0.01	<0.01
223rd Street, I-110 to Avalon	0.09	0.09	0.06	0.02	0.01	<0.01
223rd Street, Avalon to Wilmington	0.08	0.06	0.04	0.01	0.01	<0.01
223rd Street, Wilmington to Alameda	0.16	0.04	0.03	0.01	0.01	<0.01
W Wardlow from Alameda to I-710	0.23	0.05	0.04	0.01	0.01	<0.01

TABLE 3E. NO BUILD, 2030 MSAT TRAFFIC DATA RESULTS

Road Segment	Emissions (lb/day)					
	DPM	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
SR-47 Mainline, New Dock Ramps to HF Ramps	2.05	0.02	0.05	<0.01	<0.01	<0.01
Henry Ford Ramps	0.12	<0.01	0.01	<0.01	<0.01	<0.01
Henry Ford n/o Ramps to Alameda	0.77	0.01	0.03	<0.01	<0.01	<0.01
SR-103 begin (at SR-47 /Henry Ford Junction) to Anaheim	1.74	0.01	0.03	<0.01	<0.01	<0.01
SR-103 Anaheim to PCH	0.99	0.01	0.02	<0.01	<0.01	<0.01
SR-103 PCH to Sepulveda/Willow	1.18	0.01	0.02	<0.01	<0.01	<0.01
E and W Harry Bridges, Figueroa to start Alameda	0.68	0.02	0.04	<0.01	<0.01	<0.01
Alameda beginning (E Harry Bridges) to Anaheim	0.43	0.02	0.03	<0.01	<0.01	<0.01
Alameda Anaheim to Henry Ford	0.15	0.01	0.01	<0.01	<0.01	<0.01
Alameda Henry Ford to PCH	0.44	0.01	0.02	<0.01	<0.01	<0.01
Alameda PCH to 405	4.08	0.10	0.15	0.02	0.01	<0.01
Alameda 405 to del Amo	1.90	0.07	0.07	0.01	0.01	<0.01
Alameda, del Amo to South Santa Fe Avenue	0.70	0.02	0.02	<0.01	<0.01	<0.01
Alameda, South Santa Fe Avenue to SR-91	0.71	0.02	0.03	<0.01	<0.01	<0.01
I-110, "C" Street Interchange to Anaheim	1.70	0.07	0.07	0.02	0.01	<0.01
I-110, Anaheim to PCH	2.84	0.12	0.12	0.03	0.01	0.01
1-110, PCH to Sepulveda	5.13	0.25	0.23	0.05	0.03	0.01
I-110, Sepulveda to Carson	5.71	0.35	0.30	0.07	0.04	0.02
I-110, Carson to Del Amo	3.63	0.24	0.20	0.05	0.03	0.01
I-110, Del Amo to 405	2.76	0.18	0.14	0.04	0.02	0.01
I-110, 405 to SR-91	3.74	0.30	0.23	0.07	0.04	0.02
I-710, Anaheim to PCH	6.21	0.07	0.12	0.01	0.01	0.00
I-710, PCH to Willow	12.55	0.15	0.24	0.03	0.02	0.01
I-710, Willow to 405	18.94	0.23	0.37	0.04	0.03	0.01
I-710, 405 to Del Amo	17.00	0.28	0.38	0.06	0.04	0.01
I-710, Del Amo to Long Beach Blvd Interchange	13.81	0.23	0.31	0.05	0.03	0.01
I-710, Long Beach Boulevard to SR-91	11.47	0.24	0.28	0.05	0.03	0.01
PCH, I110 to Alameda	1.04	0.08	0.07	0.02	0.01	<0.01
PCH, Alameda to SR-103	0.35	0.02	0.01	0.00	<0.01	<0.01

TABLE 3E. NO BUILD, 2030 MSAT TRAFFIC DATA RESULTS

Road Segment	Emissions (lb/day)					
	DPM	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
PCH, SR-103 to I-710	2.56	0.02	0.03	0.00	<0.01	<0.01
Sepulveda, I-110 to Avalon	0.13	0.03	0.02	0.01	<0.01	<0.01
Sepulveda, Avalon to Alameda	0.20	0.04	0.03	0.01	<0.01	<0.01
Sepulveda, Alameda to ICTF	0.35	0.01	0.01	0.00	<0.01	<0.01
Sepulveda, ICTF to SR-103	0.20	<0.01	<0.01	<0.01	<0.01	<0.01
Del Amo, I-110 to Wilmington	0.26	0.06	0.04	0.01	0.01	<0.01
Del Amo, Wilmington to Alameda	0.20	0.03	0.02	0.01	<0.01	<0.01
Del Amo, Alameda to I-710	0.21	0.04	0.03	0.01	<0.01	<0.01
223rd Street, I-110 to Avalon	0.08	0.03	0.02	0.01	<0.01	<0.01
223rd Street, Avalon to Wilmington	0.05	0.02	0.01	<0.01	<0.01	<0.01
223rd Street, Wilmington to Alameda	0.15	0.01	0.01	<0.01	<0.01	<0.01
W Wardlow from Alameda to I-710	0.70	0.04	0.03	0.01	<0.01	<0.01

TABLE 3F. ALTERNATIVE 1, 2030 MSAT EMISSIONS

Road Segment	Emissions (lb/day)					
	DPM	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
SR-47 Mainline, New Dock Ramps to HF Ramps	1.76	0.01	0.03	<0.01	<0.01	<0.01
Henry Ford Ramps	0.07	<0.01	<0.01	<0.01	<0.01	<0.01
Henry Ford n/o Ramps to Alameda	0.43	0.01	0.01	<0.01	<0.01	<0.01
SR-47 Extension, HF Ramps to Alameda	3.27	0.02	0.09	<0.01	<0.01	<0.01
SR-103 begin (at SR-47 /Henry Ford Junction) to Anaheim	1.76	0.01	0.03	<0.01	<0.01	<0.01
SR-103 Anaheim to PCH	1.08	0.01	0.02	<0.01	<0.01	<0.01
SR-103 PCH to Sepulveda/Willow	1.26	0.02	0.03	<0.01	<0.01	<0.01
E and W Harry Bridges, Figueroa to start Alameda	0.84	0.02	0.03	<0.01	<0.01	<0.01
Alameda beginning (E Harry Bridges) to Anaheim	0.49	0.02	0.03	<0.01	<0.01	<0.01
Alameda Anaheim to Henry Ford	0.16	0.01	0.01	<0.01	<0.01	<0.01
Alameda, Henry Ford to PCH	0.30	<0.01	0.01	<0.01	<0.01	<0.01
Alameda PCH to 405	5.80	0.10	0.21	0.02	0.01	<0.01
Alameda 405 to del Amo	2.30	0.06	0.08	0.01	0.01	<0.01
Alameda, del Amo to South Santa Fe Avenue	0.83	0.02	0.03	<0.01	<0.01	<0.01
Alameda, South Santa Fe Avenue to SR-91	0.86	0.02	0.03	<0.01	<0.01	<0.01
I-110, "C" Street Interchange to Anaheim	1.56	0.07	0.07	0.01	0.01	<0.01
I-110, Anaheim to PCH	2.60	0.12	0.11	0.02	0.01	0.01
1-110, PCH to Sepulveda	4.86	0.25	0.22	0.05	0.03	0.01
I-110, Sepulveda to Carson	5.44	0.35	0.29	0.07	0.04	0.02
I-110, Carson to Del Amo	3.47	0.24	0.19	0.05	0.03	0.01
I-110, Del Amo to 405	2.63	0.18	0.14	0.04	0.02	0.01
I-110, 405 to SR-91	3.67	0.30	0.23	0.07	0.04	0.02
I-710, Anaheim to PCH	5.64	0.07	0.11	0.01	0.01	0.00
I-710, PCH to Willow	11.54	0.14	0.22	0.03	0.02	0.01
I-710, Willow to 405	17.42	0.23	0.34	0.04	0.03	0.01
I-710, 405 to Del Amo	16.42	0.28	0.37	0.06	0.04	0.01
I-710, Del Amo to Long Beach Blvd Interchange	13.41	0.23	0.31	0.05	0.03	0.01
I-710, Long Beach Boulevard to SR-91	11.20	0.24	0.28	0.05	0.03	0.01
PCH, I110 to Alameda	1.11	0.08	0.07	0.02	0.01	<0.01

TABLE 3F. ALTERNATIVE 1, 2030 MSAT EMISSIONS

Road Segment	Emissions (lb/day)					
	DPM	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
PCH, Alameda to SR-103	0.16	0.02	0.01	<0.01	<0.01	<0.01
PCH, SR-103 to I-710	1.10	0.02	0.02	<0.01	<0.01	<0.01
Sepulveda, I-110 to Avalon	0.13	0.03	0.02	0.01	<0.01	<0.01
Sepulveda, Avalon to Alameda	0.21	0.04	0.03	0.01	<0.01	<0.01
Sepulveda, Alameda to ICTF	0.19	0.01	0.01	<0.01	<0.01	<0.01
Sepulveda, ICTF to SR-103	0.17	<0.01	<0.01	<0.01	<0.01	<0.01
Del Amo, I-110 to Wilmington	0.25	0.06	0.04	0.01	0.01	<0.01
Del Amo, Wilmington to Alameda	0.20	0.02	0.02	0.01	<0.01	<0.01
Del Amo, Alameda to I-710	0.20	0.04	0.03	0.01	<0.01	<0.01
223rd Street, I-110 to Avalon	0.09	0.03	0.02	0.01	<0.01	<0.01
223rd Street, Avalon to Wilmington	0.05	0.02	0.01	<0.01	<0.01	<0.01
223rd Street, Wilmington to Alameda	0.19	0.01	0.01	<0.01	<0.01	<0.01
W Wardlow from Alameda to I-710	1.10	0.04	0.03	0.01	<0.01	<0.01

TABLE 3G. ALTERNATIVE 2, 2030 MSAT EMISSIONS

Road Segment	Emissions (lb/day)					
	DPM	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
SR-47 Mainline, New Dock Ramps to HF Ramps	3.07	0.02	0.05	<0.01	<0.01	<0.01
Henry Ford Ramps	0.10	<0.01	<0.01	<0.01	<0.01	<0.01
Henry Ford n/o Ramps to Alameda	0.57	0.01	0.01	<0.01	<0.01	<0.01
SR-103 begin (at SR-47 /Henry Ford Junction) to Anaheim	4.17	0.02	0.07	<0.01	<0.01	<0.01
SR-103 Anaheim to PCH	2.57	0.02	0.04	<0.01	<0.01	<0.01
SR-103 PCH to Sepulveda/Willow	1.90	0.01	0.03	<0.01	<0.01	<0.01
E and W Harry Bridges, Figueroa to start Alameda	0.75	0.02	0.03	<0.01	<0.01	<0.01
Alameda beginning (E Harry Bridges) to Anaheim	0.42	0.02	0.03	<0.01	<0.01	<0.01
Alameda Anaheim to Henry Ford	0.14	0.01	0.01	<0.01	<0.01	<0.01
Alameda, Henry Ford to PCH	0.31	0.01	0.01	<0.01	<0.01	<0.01
Alameda PCH to 405	2.17	0.09	0.10	0.02	0.01	<0.01
Alameda 405 to del Amo	2.56	0.06	0.08	0.01	0.01	<0.01
Alameda, del Amo to South Santa Fe Avenue	0.89	0.02	0.03	<0.01	<0.01	<0.01
Alameda, South Santa Fe Avenue to SR-91	0.92	0.02	0.03	<0.01	<0.01	<0.01
I-110, "C" Street Interchange to Anaheim	1.51	0.07	0.07	0.01	0.01	<0.01
I-110, Anaheim to PCH	2.53	0.12	0.11	0.02	0.01	0.01
1-110, PCH to Sepulveda	4.68	0.25	0.22	0.05	0.03	0.01
I-110, Sepulveda to Carson	5.24	0.35	0.29	0.07	0.04	0.02
I-110, Carson to Del Amo	3.33	0.24	0.19	0.05	0.03	0.01
I-110, Del Amo to 405	2.53	0.18	0.14	0.04	0.02	0.01
I-110, 405 to SR-91	3.56	0.30	0.23	0.07	0.04	0.02
I-710, Anaheim to PCH	5.61	0.07	0.11	0.01	0.01	<0.01
I-710, PCH to Willow	11.18	0.15	0.23	0.03	0.02	0.01
I-710, Willow to 405	16.87	0.23	0.36	0.04	0.03	0.01
I-710, 405 to Del Amo	16.19	0.28	0.37	0.06	0.04	0.01
I-710, Del Amo to Long Beach Blvd Interchange	13.49	0.23	0.31	0.05	0.03	0.01
I-710, Long Beach Boulevard to SR-91	11.28	0.24	0.28	0.05	0.03	0.01
PCH, I110 to Alameda	1.02	0.08	0.07	0.02	0.01	<0.01
PCH, Alameda to SR-103	0.12	0.02	0.01	<0.01	<0.01	<0.01

TABLE 3G. ALTERNATIVE 2, 2030 MSAT EMISSIONS

Road Segment	Emissions (lb/day)					
	DPM	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
PCH, SR-103 to I-710	0.88	0.02	0.03	<0.01	<0.01	<0.01
Sepulveda, I-110 to Avalon	0.13	0.03	0.02	0.01	<0.01	<0.01
Sepulveda, Avalon to Alameda	0.18	0.04	0.03	0.01	<0.01	<0.01
Sepulveda, Alameda to ICTF	0.12	0.01	0.01	<0.01	<0.01	<0.01
Sepulveda, ICTF to SR-103	0.15	<0.01	<0.01	<0.01	<0.01	<0.01
Del Amo, I-110 to Wilmington	0.24	0.06	0.04	0.01	0.01	<0.01
Del Amo, Wilmington to Alameda	0.20	0.02	0.02	0.01	<0.01	<0.01
Del Amo, Alameda to I-710	0.29	0.04	0.03	0.01	<0.01	<0.01
223rd Street, I-110 to Avalon	0.08	0.03	0.02	0.01	<0.01	<0.01
223rd Street, Avalon to Wilmington	0.07	0.02	0.01	<0.01	<0.01	<0.01
223rd Street, Wilmington to Alameda	0.25	0.01	0.01	<0.01	<0.01	<0.01
W Wardlow from Alameda to I-710	0.94	0.04	0.03	0.01	<0.01	<0.01

Limitations of Analysis

The following discussion regarding the limitations of the MSAT analysis is prototype language taken from the Interim Guidance, Appendix C.

Unavailable Information for Project Specific MSAT Impact Analysis

This MSAT analysis includes a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with the project alternatives. Due to these limitations, the following discussion is included in accordance with CEQ regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information:

Information that is Unavailable or Incomplete. Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling to estimate ambient concentrations resulting from the estimated emissions, exposure modeling to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

- Emissions: The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of MSATs in the context of highway projects. While MOBILE 6.2 is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE 6.2 is a trip-based model--emission factors are projected based on a typical trip of 7.5 miles, and on average speeds for this typical trip. This means that MOBILE 6.2 does not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE 6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects, and cannot adequately capture emissions effects of smaller projects. For PM, the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Also, the emissions rates used in MOBILE 6.2 for both particulate matter and MSATs are based on a limited number of tests of mostly older-technology vehicles. Lastly, in its discussions of PM under the conformity rule, EPA has identified problems with MOBILE6.2 as an obstacle to quantitative analysis.

- In California, the emission factor model EMFAC2007 is used to calculate motor vehicle emission rates. The CARB developed EMFAC as an emission inventory model for motor vehicles. EMFAC2007 incorporates data such as temperature, humidity, vehicle age, and vehicle mix. Similar to MOBILE6.2, EMFAC2007 is a trip-based model that estimates emission rates based on average speeds and typical trips. This also means that

EMFAC2007 would not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. For an MSAT analysis, EMFAC2007 is limited because it only provides emission factors for diesel PM and does not provide emission factors for the five other priority MSATs.

These deficiencies compromise the capability of MOBILE 6.2 and EMFAC2007 to estimate MSAT emissions. MOBILE6.2 and EMFAC2007 are adequate tools for projecting emissions trends, and performing relative analyses between alternatives for very large projects, but these models are not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations.

- Dispersion. The tools to predict how MSATs disperse are also limited. The EPA's current regulatory models, CALINE3 and CAL3QHC, were developed and validated more than a decade ago for the purpose of predicting episodic concentrations of carbon monoxide to determine compliance with the NAAQS. In California, the dispersion model CALINE4 is used to predict concentrations of carbon monoxide. CALINE4 was developed by Caltrans and can predict pollutant concentrations within 500 meters of a roadway. CALINE4 can evaluate CO and PM dispersion and incorporates the Discrete Parcel Method to estimate NO_2 concentrations. The performance of dispersion models is more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area. This limitation makes it difficult to predict accurate exposure patterns at specific times at specific highway project locations across an urban area to assess potential health risk. The National Cooperative Highway Research Program is conducting research on best practices in applying models and other technical methods in the analysis of MSATs. This work also will focus on identifying appropriate methods of documenting and communicating MSAT impacts in the NEPA process and to the general public. Along with these general limitations of dispersion models, FHWA is also faced with a lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.
- Exposure Levels and Health Effects. Finally, even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude us from reaching meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. There are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis.

Summary of Existing Credible Scientific Evidence Relevant to Evaluating the Impacts of MSATs. Research into the health impacts of MSATs is ongoing. For different emission types, there are a variety of studies that show that some either are statistically associated with adverse health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses.

Exposure to toxics has been a focus of a number of EPA efforts. Most notably, the agency conducted the National Air Toxics Assessment (NATA) in 1996 to evaluate modeled estimates of human exposure applicable to the county level. While not intended for use as a measure of or benchmark for local exposure, the modeled estimates in the NATA database best illustrate the levels of various toxics when aggregated to a national or state level.

The EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The EPA Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS database is located at http://www.epa.gov/iris. The following toxicity information for the six prioritized MSATs was taken from the IRIS database Weight of Evidence Characterization summaries. This information is taken verbatim from EPA's IRIS database and represents the Agency's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures.

- Benzene is characterized as a known human carcinogen.
- The potential carcinogenicity of acrolein cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.
- Formaldehyde is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.
- 1,3-butadiene is characterized as carcinogenic to humans by inhalation.
- Acetaldehyde is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.
- Diesel exhaust (DE) is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases.
- Diesel exhaust also represents chronic respiratory effects, possibly the primary noncancer hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms, such as cough, phlegm, and chronic bronchitis. Exposure relationships have not been developed from these studies.

There have been other studies that address MSAT health impacts in proximity to roadways. The Health Effects Institute, a non-profit organization funded by EPA, FHWA, and industry, has undertaken a major series of studies to research near-roadway MSAT hot spots, the health implications of the entire mix of mobile source pollutants, and other topics. The final summary of the series is not expected for several years.

Some recent studies have reported that proximity to roadways is related to adverse health outcomes -- particularly respiratory problems. Much of this research is not specific to MSATs, instead surveying the full spectrum of both criteria and other pollutants. The FHWA cannot evaluate the validity of these studies, but more importantly, they do not provide information that would be useful to alleviate the uncertainties listed above and enable us to perform a more comprehensive evaluation of the health impacts specific to this project.

Relevance of Unavailable or Incomplete Information to Evaluating Reasonably Foreseeable Significant Adverse Impacts on the Environment, and Evaluation of Impacts Based Upon Theoretical Approaches or Research Methods Generally Accepted in the Scientific Community. Because of the uncertainties outlined above, a quantitative assessment of the effects of air toxic emissions impacts on human health cannot be made at the project level. While available tools do allow us to reasonably predict relative emissions changes between alternatives for larger projects, the amount of MSAT emissions from each of the project alternatives and MSAT concentrations or exposures created by each of the project alternatives cannot be predicted with enough accuracy to be useful in estimating health impacts. (As noted above, the current emissions model is not capable of serving as a meaningful emissions analysis tool for smaller projects.) Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have "significant adverse impacts on the human environment."

This MSAT analysis has provided a quantitative analysis of MSAT emissions relative to the various alternatives, and has acknowledged that for the analysis years 2015 and 2030 total MSAT emissions from Alternatives 1 and 2 may result in slightly higher MSAT emissions in certain locations when compared to the No-Build alternative. However, the concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated.

References

California Air Resources Board (CARB). 2006. *EMFAC 2007, Version 2.3.*

Federal Highway Administration (FHWA). 2006. "*Interim Guidance on Air Toxic Analysis for National Environmental Policy Act (NEPA) Documents*". February.

University of California, Davis (UCD). 2006a. *Project-Level Mobile Source Air Toxics Analysis: Spreadsheet Tool*, version 1.2. November.

University of California, Davis (UCD). 2006b. *Estimating Mobile Source Air Toxics Emissions: A Step-by-Step Project Analysis Methodology.* December.

U.S. Environmental Protection Agency (EPA). 2001. *Control of Emissions of Hazardous Air Pollutants from Mobile Sources* (40 CFR Parts 80 and 86). March.

Appendix O
SCAG 2006 RTIP State Highway Project List – Los Angeles County

2006 Regional Transportation Improvemen Program
Amendment #06-13
Changes in Project Completion Year and/or Description between 2006 RTIP (through Amend. 13)/2004 RTP (through Amend. 3) and Draft 2008 RTP

2006 RTIP / 2004 RTP AMEND #3							2008 RTP								
CO	SYS	PROJECT ID	RTE	DESCRIPTION	COMPL YEAR	NET-WORK	CO	SYS	PROJECT ID	RTE	DESCRIPTION	COMPL YEAR	NET-WORK	**DESCRIP CHANGE**	**NETWORK CHANGE**
LA	S	LA01348	14	NEAR PALMDALE FROM ESCONDIDO CYN RD TO MOUNTAIN SPRING ROAD: WIDEN FWY FOR ONE HOV IN EACH DIRECTION. (EA-117101, PPNO# 0389N)	2006	2006	LA	S	LA01348	14	NEAR PALMDALE FROM ESCONDIDO CYN RD TO MOUNTAIN SPRING ROAD: WIDEN FWY FOR ONE HOV IN EACH DIRECTION. (EA-117101, PPNO# 0389N)	2006	2007		X
LA	S	LA0C8102	14	SR-14 FREEWAY/AVENUE I INTERCHANGE IMPROVEMENTS-WIDENING AVE I FROM 2 TO 3 LANES IN EACH DIRECTION, ADDING DUAL LEFT TURN LANES, AND WIDENING A BRIDGE STRUCTURE. PPNO 3123.	2007	2010	LA	S	LA0C8102	14	SR-14 FREEWAY/AVENUE I INTERCHANGE IMPROVEMENTS-WIDENING AVE I FROM 2 TO 3 LANES IN EACH DIRECTION, ADDING DUAL LEFT TURN LANES, AND WIDENING A BRIDGE STRUCTURE. PPNO 3123.	2007	2007		X
LA	S	LA962201	14	NEAR SANTA CLARITA, FROM RT 5 TO 126/S.F. RD HOV PROJECT - ADD 1 HOV LN EACH DIR (EA# 119843, PPNO# 0380G)	2005	2006	LA	S	LA962201	14	NEAR SANTA CLARITA, FROM RT 5 TO 126/S.F. RD HOV PROJECT - ADD 1 HOV LN EACH DIR (EA# 119843, PPNO# 0380G)	2005	2007		X
LA	S	LA0D45	47	SR-47 EXPRESSWAY: REPLACEMENT OF COMMODORE HEIM BRIDGE & ELEVATED 4-LANE EXPRESSWAY BETWEEN COMMODORE HEIM BRIDGE & ALAMEDA ST (SR-47). SAFETEA-LU # 712 & # 3797	2011	2020	LA	S	LA0D45 (Part 1 of 2)	47	SCHUYLER HEIM BRIDGE REPLACEMENT (2 MF + 1 AUX NB, 3 MF + 1 AUX SB); CONSTRUCT NEW LIMITED-ACCESS, GRADE-SEPARATED, SR-47 EXPRESSWAY (4 TO 7 LNS) ALONG NEW ALIGNMENT FROM OCEAN BLVD TO ALAMEDA ST/PCH	2011	2012	X (ALSO SPLIT INTO 2 PHASES)	X
									LA0D45 (Part 2 of 2)	47	CONSTRUCT NEW 2-LANE FLYOVER FROM EB OCEAN BLVD (1,200 METERS W/O OCEAN BLVD / SR-47 INTERSECTION) TO NB SR-47 (AT THE NEW BRIDGE)	2017	2020		X
LA	S	LA0D399	60	CONSTRUCTION OF NEW PARTIAL DIAMOND INTERCHANGE AT LEMON AVE - EB/WB OFF 2 LNS. EB/WB ON 2 LNS (1 IS HOV). (SAFETEA-LU # 587).	2009	2010	LA	S	LA0D399	60	CONSTRUCTION OF NEW PARTIAL DIAMOND INTERCHANGE AT LEMON AVE - EB/WB OFF 2 LNS. EB/WB ON 2 LNS (1 IS HOV). (SAFETEA-LU # 587).	2009	2009		X
LA	S	12570	60	RTE. 57/60 HOV CONNECTOR INDUSTRY FROM OLD BREA CANYON ROAD TO GRAND AVENUE - HOV DIRECT CONNECTORS AND COLLECTOR ROAD (BOTH DIRECTIONS) (EA# 12570, PPNO# 0499Q)	2007	2010	LA	S	12570	60	RTE. 57/60 HOV CONNECTOR INDUSTRY FROM OLD BREA CANYON ROAD TO GRAND AVENUE - HOV DIRECT CONNECTORS AND COLLECTOR ROAD (BOTH DIRECTIONS) (EA# 12570, PPNO# 0499Q)	2007	2007		X

Appendix P
SCAG 2008 RTP Project List – Los Angeles County

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

RTP 2008 REGIONAL TRANSPORTATION PLAN

Making the Connections

Project Listing Report

DRAFT

DECEMBER 2007

PROJECT LIST

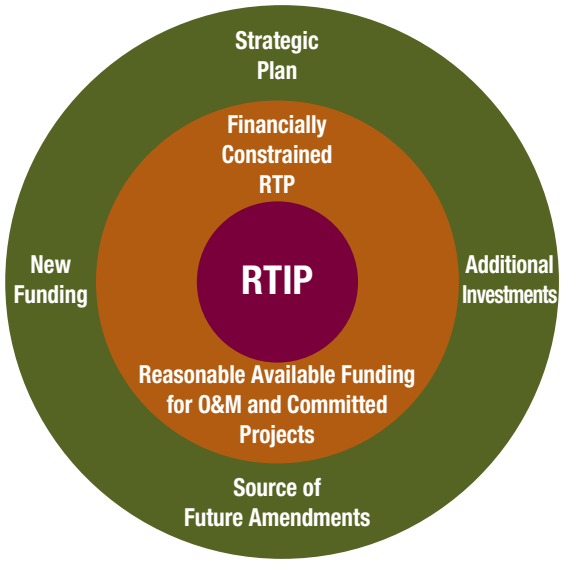
RTIP Projects **1**
Imperial County RTIP Projects 2
Los Angeles County RTIP Projects 4
Orange County RTIP Projects 42
Riverside County RTIP Projects 52
San Bernardino County RTIP Projects 68
Ventura County RTIP Projects 84

Financially Constrained RTP Projects **92**
Imperial County RTP Projects 92
Los Angeles County RTP Projects 93
Orange County RTP Projects 96
Riverside County RTP Projects 100
San Bernardino County RTP Projects 143
Ventura County RTP Projects 184
Regional RTP Projects 190

Strategic Plan Projects **193**
Imperial County Strategic Plan Projects 193
Los Angeles County Strategic Plan Projects 195
Riverside County Strategic Plan Projects 199
San Bernardino County Strategic Plan Projects 200
VentUra County Strategic Plan Projects 203
Regional Strategic Plan Projects 204

The project list is divided into three sections, consistent with the framework provided in Figure 1. At the center is the Regional Transportation Improvement Program (RTIP), which forms the foundation of the RTP project investment strategy and represents the first six years of already-committed funding. The RTP contains an additional financially constrained set of transportation projects above and beyond the RTIP. Finally, the Strategic Plan represents an unconstrained, illustrative list of potential projects that the region would pursue given additional funding and commitment.

FIGURE 1 RTP FRAMEWORK



RTIP Projects

The adopted 2006 RTIP is incorporated into the 2008 RTP, and the following tables present the RTIP projects and their estimated total project costs. For more detailed information on the RTIP projects, refer to the complete 2006 RTIP project listing available at www.scag.ca.gov.

Projects are sorted by system (S = state highway, L = local highway, T = transit). State highways are further sorted by route number, while local highways and transit projects are sorted by RTP ID number.

Project costs are presented in nominal dollars.

LOS ANGELES COUNTY RTIP PROJECTS				
SYS-TEM*	RTP ID	ROUTE	DESCRIPTION	PROJECT COST ($1,000'S)
S	LAE0465	5	IN L.A./SANTA CLARITA ON ROUTE 5 FROM SR14 TO PARKER RD, HOV & TRUCK LANE IMPROVEMENTS	$507,330
S	LAE2577	5	STUDY NORWALK, SANTA FE SPRINGS, DOWNEY, MONTEBELLO, & COMMERCE: ON I-5, CONDUCT PLANNING, ENV. & ENG. STUDIES FOR WIDENING W/HOV & MIXED FLOW LANES FROM I-605 TO I-710.	$6,738
S	0309S	10	BALDWIN PARK AND WEST COVINA – PUENTE AVE TO CITRUS STREET SOUNDWALL PROJECT (95 STIP-IIP) (EA# 111720, PPNO# 0309S)	$11,760
S	LA000548	10	FROM PUENTE TO CITRUS HOV LANES FROM 8 TO 10 LANES (C-ISTEA 77720) (EA# 117080, PPNO# 0309N)	$205,136
S	LA01342	10	RT 10 FROM RT 605 TO PUENTE AVE HOV LANES (8+0 TO 8+2) (EA# 117070, PPNO 0306H) PPNO 3333 3382 AB 3090 REP (TCRP #40)	$210,651
S	LA0B875	10	HOV LANES FROM CITRUS TO ROUTE 57/210 – (EA# 11934, PPNO# 0310B)	$214,143
S	LA0F098	10	L.A. COUNTY I-10 AND I-605 IC;CONSTRUCT ONE/TWO LANE BRIDGE STRUCTURE, BRANCHING OFF SB OF RTE 605 TO EB OF RTE 10 AT-GRADE CONNECTOR RAMP (EA: 24540, PPNO 3529)	$84,748
S	LA0C8102	14	SR-14 FREEWAY/AVENUE I INTERCHANGE IMPROVEMENTS-WIDENING AVE I FROM 2 TO 3 LANES IN EACH DIRECTION, ADDING DUAL LEFT TURN LANES, AND WIDENING A BRIDGE STRUCTURE. PPNO 3123.	$10,581
S	LA0D45	47	SCHUYLER HEIM BRIDGE REPLACEMENT (2 MF + 1 AUX NB, 3 MF + 1 AUX SB); CONSTRUCT SR-47 EXPRESSWAY (4 TO 7 LANES) FROM OCEAN BLVD TO ALAMEDA ST/PCH; CONSTRUCT NEW 2-LANE FLYOVER FROM EB NAVY WAY TO NB SR-47	$868,905
S	LA0B412	60	ROUTE 57/60 INTERCHANGE MIS (E/P, PS/E ONLY)	$1,191
S	LA0D399	60	CONSTRUCTION OF NEW PARTIAL DIAMOND INTERCHANGE FOR STATE ROUTE 60 (SR-60) AT LEMON AVE (SAFETEA-LU # 587).	$21,079
S	LA996137	60	RTE. 60 HOV LANES. FROM RTE. 605 TO BREA CANYON RD. -- CONSTRUCT ONE HOV LANE IN EACH DIRECTION) (CFP: 358, 4262, 6137=67,150+IIP: 5,100) (EA# 129410, 129421, PPNO 0482R,0482RA)	$162,352
S	LA0B951	71	ROUTE 10 TO ROUTE 60 – EXPRESSWAY TO FREEWAY CONVERSION – ADD 1 HOV LANE AND 1 MIXED FLOW LANE EACH DIRECTION . (2001 CFP 8349, TCRP #50) (EA# 210600, PPNO 2741) SAFETEA-LU # 3771 (TCRP #50)	$701,446
S	LA0D31	101	CONSTRUCT ONE ADDITIONAL LANE FOR BOTH NORTH AND SOUTH BOUND OFF-RAMPS AT VAN NUYS BLVD. (RIP 1 M, IIP 8 M) (EA# 199630) (PPNO 2789) (DEMO= NAT. CORRIDOR PLANNING AND BORDER DEV.)	$2,885
S	17850	105	LOS ANGELES – SEPULVEDA BLVD TO NASH STREET – WIDEN N/B OFF-RAMP @ SEPULVEDA BL FROM W/B RTE 105. FROM 1 LANE TO 2 LANES. (PPNO# 2119, EA# 17850K) (IIP $7,394)	$19,820
S	LA0D328	110	IN LOS ANGELES-SB HARBOR FREEWAY FROM 8TH STREET ON-RAMP TO I-110/I-10 CONNECTOR, CONSTRUCT AUXILIARY LANE AND MODIFY RAMPS (EA 24110, PPNO 3343)	$37,363
S	LA0D329	110	IN LOS ANGELES; NB HARBOR FREEWAY FROM THE NORTH END OF 12TH STREET UC TO THE NORTH END OF THE 7TH STREET UC; ADD AUXILIARY LANE AND RECONSTRUCT RAMP (EA: 24120, PPNO 3344)	$21,201

Appendix Q
Health Risk Assessment