AIR QUALITY ANALYSIS

I-77/I- 81
Overlap Improvements

0077-098-104, P100

(UPC 51441)

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Summary

The Virginia Department of Transportation is proposing to make improvements to the I-77/I-81 overlap in Wythe County. The study corridor extends 9 miles from exit 72 (I-77) to exit 81 (I-77) near Wytheville. Federal funding is involved, thus compliance with the National Environmental Policy Act (NEPA) is required.

This project has been assessed for potential air quality impacts and conformity with applicable air quality regulations and requirements. The project has been found to meet these requirements and as such, it will not cause or contribute to a violation of national ambient air quality standards (NAAQS) as established by the US Environmental Protection Agency (US EPA). In regards to Mobile Source Air Toxics, best available information indicates that, nationwide, regional levels of air toxics are expected to decrease in the future due to fleet turnover and the continued implementation of more stringent emission and fuel quality regulations. Nevertheless, it is possible that some localized areas may show an increase in emissions and ambient levels of these pollutants due to locally increased traffic levels associated with the project.

This project lies in an area that is currently in attainment with all of the National Ambient Air Quality Standards (NAAQS). The following DEQ air pollution regulations must be adhered to during the construction of this project: 9 VAC 5-50-60 et seq., Fugitive Dust precautions; and 9 VAC 5-40-5600 et seq., Open Burning precautions.

Emissions may be produced in the construction of this project from heavy equipment and vehicle travel to and from the site, as well as from fugitive sources. Construction emissions are short term or temporary in nature. In order to mitigate these emissions, all construction activities are to be performed in accordance with VDOT Road and Bridge Specifications.

Project Description & Traffic Forecasts

The project consists of two alternatives to improve the existing I-81/I-77 overlap, a widening scenario and a new alignment scenario for I-81. The widening alternative would increase the I-77/I-81 overlap from six to eight lanes. The new alignment alternative would create a separate 4 lane highway in addition to the existing 6 lane highway. Figure 1 provides a diagram of the study area. The exit 81 interchange is expected to be the highest volume interchange associated with the project, however worst case traffic conditions were used to model both the widening alternative and new highway alternative. A T-interchange and four-way interchange configurations were used to represent each alternative. Figure 2 provides an aerial view of the existing interchange.

Average daily traffic (ADT) forecasts were developed for base year (2007) opening (2015) and design (2035) years[1], although worst-case traffic volumes were used in the analysis for the opening and design years as described later in this document. The design year ADT for I-77/I-

[1] E-mails dated June 16, 2009 and August 14, 2009 from VHB to environmental division staff.

81 overlap widening alternative is approximately 99,915 with a design peak hourly volume of 7539. The design year ADT for the I-81 on new alignment alternative is 49,913 with a design peak hourly volume of 3,536. The design year ADT for the existing I-77/I-81 overlap is 50,002 with a peak hourly volume of 4,003. A copy of the traffic forecasts is provided as Attachment A.

Figure 1: Project study area

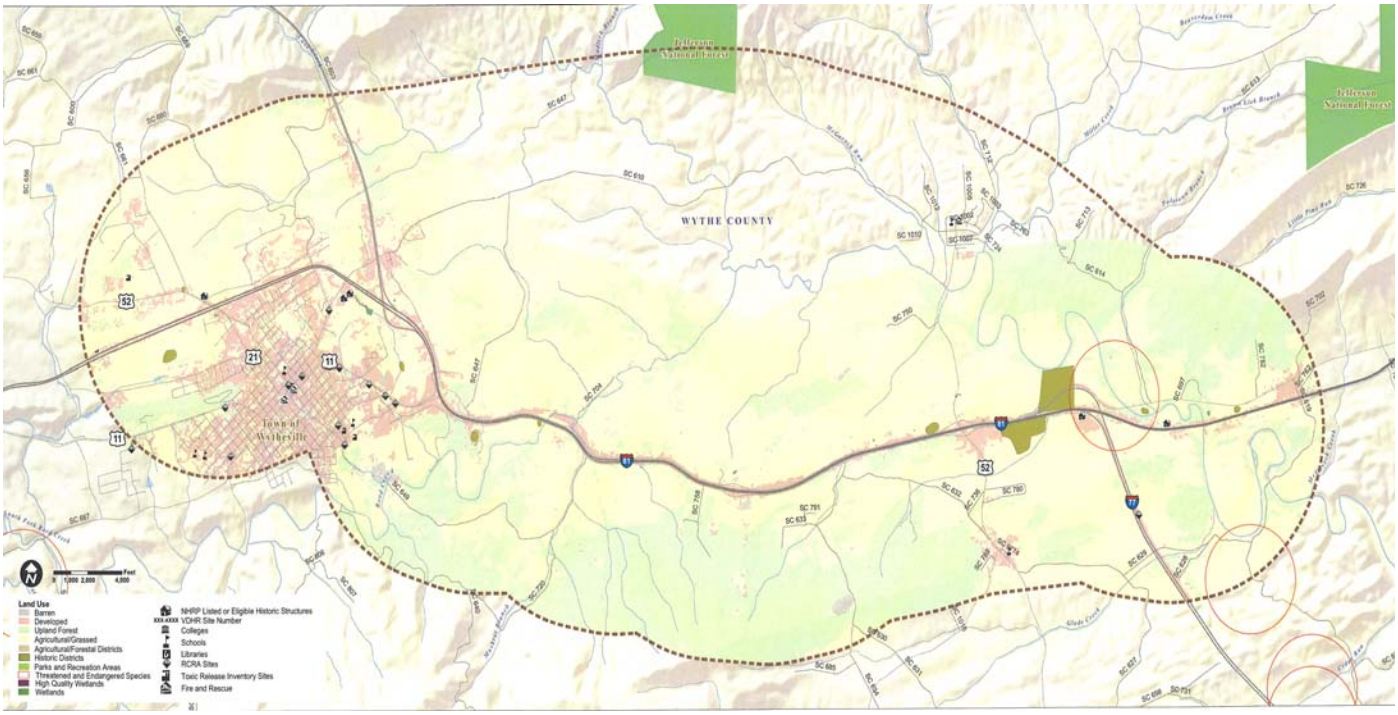
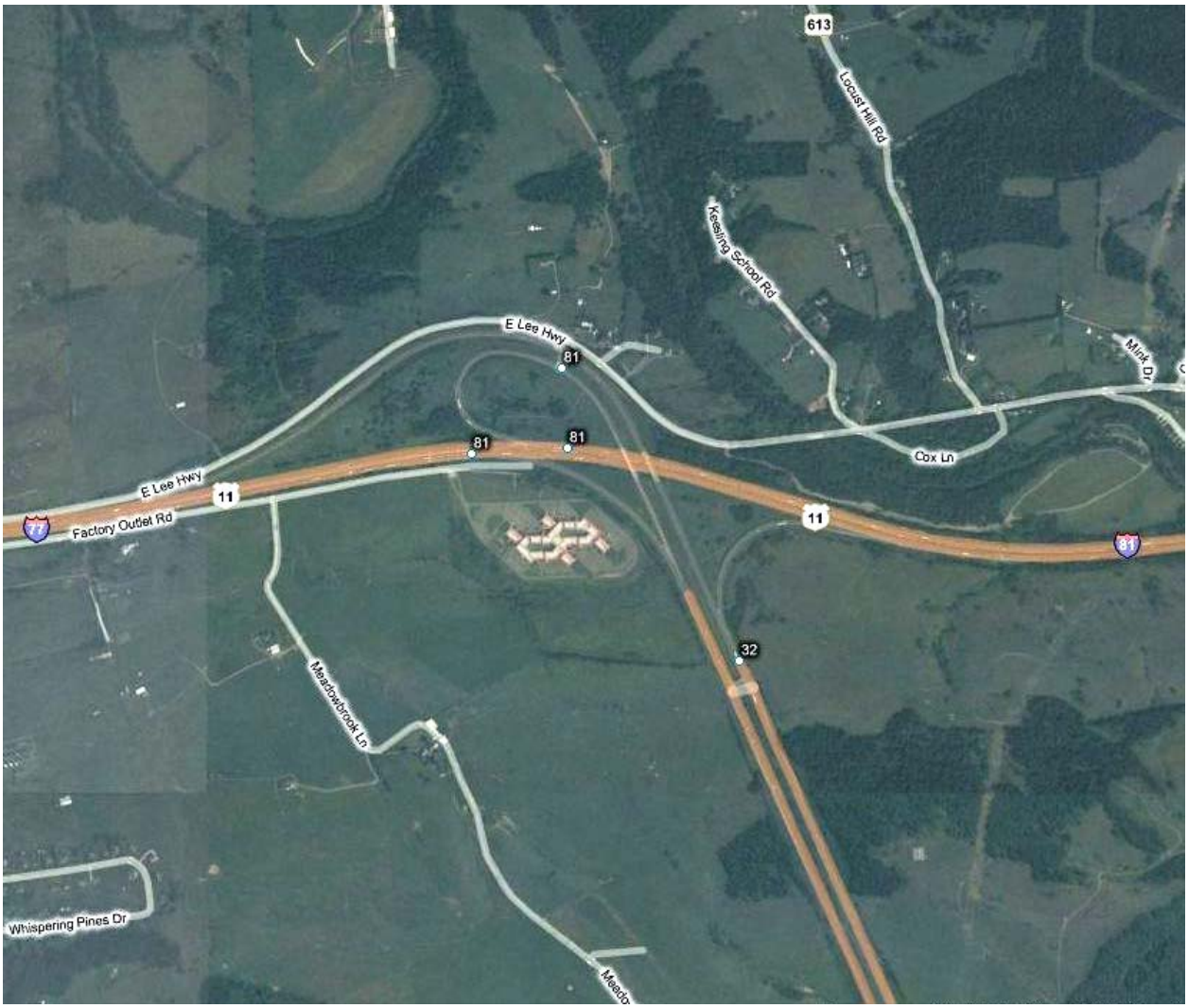


Figure 2: Aerial View existing Exit 81 Interchange



Regulatory Requirements

An overview of regulatory requirements and guidance is provided below.

NEPA and Conformity Requirements & Guidance

Air quality analyses requirements are addressed both by NEPA (including recently issued federal guidance for the assessment of Mobile Source Air Toxics, or MSATs) and federal transportation conformity regulations. Applicable requirements and updates are summarized below.

On August 4, 2004, the Federal Highway Administration (FHWA) and VDOT completed a "Project-Level Air Quality Studies Agreement"[2] ("Agreement") addressing requirements for NEPA project-level air quality analyses. Under this Agreement, project-level air quality (hot-spot) analyses are conducted for carbon monoxide (CO) for projects that meet traffic and related criteria as specified in the agreement. For example, projects that qualify for programmatic categorical exclusions (PCEs) under NEPA were exempted from analysis under the first criterion in the Agreement, while projects for which an Environmental Impact Statement (EIS) is being prepared were required to include a hot-spot analysis for CO. Other key thresholds or criteria were specified in the Agreement.

On October 28, 2004, FHWA provided related project-level analysis guidance[3] to VDOT to address the process for updating existing air quality studies. The specified process applies, for example, to projects for which requisite air quality studies have already been completed (and related approvals obtained) but the project has been delayed in implementation or changes are made to assumptions (such as design year and associated traffic projections) relating to its design or implementation.

On February 3, 2006, FHWA and EPA issued joint guidance[4] for the assessment of MSATs in the NEPA process for highways. The MSATs guidance includes specific criteria for determining which projects are to be considered exempt from MSAT analysis requirements, which may require a qualitative analysis, and which should undergo a more rigorous quantitative assessment. Projects considered exempt under section 40 CFR 93.126 of the federal conformity rule are also specifically designated as exempt from MSATs analysis requirements. The priority MSATs identified in the guidance are benzene, formaldehyde, acetaldehyde, diesel particulate matter/diesel exhaust organic gases, acrolein, and 1,3-butadiene; however, the guidance also indicates that this list is subject to change.

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2 Documented in a letter dated August 4, 2004 from VDOT to FHWA.

3 "Procedures for Updating Air Studies When New Planning Assumptions Become Available", letter dated October 28, 2004 from FHWA to VDOT.

4 "Interim Guidance on Air Toxic Analysis in NEPA Documents", dated 2/3/06, jointly issued by EPA and FHWA. A copy may be found online at: http://www.fhwa.dot.gov/environment/airtoxic/020306guidmem.htm.

On February 27, 2009, the Federal Highway Administration (FHWA) and VDOT updated the Project Level Carbon Monoxide Air Quality Studies Agreement to incrementally increase the threshold traffic volumes based on updated worst-case modeling results. The new thresholds are subject to specified limitations on intersection (and interchange) skew angles.

The federal conformity rule (40 CFR Parts 51 and 93) requires air quality conformity determinations for transportation plans, programs and projects in "non-attainment or maintenance areas for transportation-related criteria pollutants for which the area is designated nonattainment or has a maintenance plan" (40 CFR 93.102(b)). Regional conformity analysis requirements apply for plans and programs; hot-spot analysis requirements apply for projects.

Non-attainment and maintenance areas are ones that do not meet or have not met National Ambient Air Quality Standards (NAAQS), which are established by the US EPA. Transportation-related criteria pollutants as specified in the conformity rule (40 CFR 93.102(b)) include ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), and particulate matter less than 10 and 2.5 microns in diameter (PM_{10} and $PM_{2.5}$, respectively). Precursors to these pollutants are also specified in the rule. Currently applicable NAAQS are listed in Table 1.

The federal conformity rule requires a currently conforming transportation plan and program at the time of project approval (40 CFR 93.114) and for the project to be from a conforming plan and program (40 CFR 93.115). Conditions for this purpose are specified. For example, if the project is of a type or one that is not required to be specifically identified, the project must be consistent with the policies and purpose of the transportation plan and not interfere with other projects specifically included in the transportation plan (40 CFR 93.115(b)). Additionally, the design concept and scope of the project as specified in the program at the time of the regional conformity determination should be adequate to determine its contribution to regional emissions, and any mitigation measures associated with the project should have written commitments from the project sponsor and/or operator (40 CFR 93.1115(c)).

Project level (hot-spot) air quality conformity analysis requirements apply only for FHWA (and Federal Transit Administration, or FTA) projects and only for ones located in air quality non-attainment and/or maintenance areas for CO, PM_{10} and/or $PM_{2.5}$ (40 CFR 93.116(a))[5]. FHWA and FTA projects are defined in the federal conformity rule and are generally considered ones for which federal funding or approvals are proposed or required (40 CFR 93.100).

The federal conformity rule requires that the "FHWA/FTA projects must not cause or contribute to any new localized CO, PM_{10}, and/or $PM_{2.5}$ violations or increase the frequency or severity of any existing CO, PM_{10} and/or $PM_{2.5}$ violations in CO, PM_{10} and $PM_{2.5}$ nonattainment and maintenance areas" (40 CFR 93.116(a)). Other general requirements for hot-spot analyses for CO and fine particulate matter are listed in Section 93.116 of the conformity rule.

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5 Hot-spot analyses for CO may still be required to meet NEPA requirements if certain project-related criteria specified in the 2009 FHWA-VDOT Agreement are met, as noted previously.

Section 93.123 of the conformity rule specifies procedures for the preparation of hot-spot analyses for both CO and fine particulate matter. The VDOT-FHWA Agreement noted above responds to the federal requirements for CO hot-spot analyses and provides additional or more specific procedures or criteria for their preparation.

Requirements for hot-spot analyses for particulate matter are limited to the following types of projects in the federal conformity rule (40 CFR 93.123(b)(1)):

> *"(1) The hot-spot demonstration required by §93.116 must be based on quantitative analysis methods for the following types of projects:*
> *(i) New or expanded highway projects that have a significant number of or significant increase in diesel vehicles;*
> *(ii) Projects affecting intersections that are at Level-of-Service D, E, or F with a significant number of diesel vehicles, or those that will change to Level-of-Service D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;*
> *(iii) New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location:*
> *(iv) Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location; and*
> *(v) Projects in or affecting locations, areas, or categories of sites which are identified in the PM10 or PM2.5 applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation."*

The following conditions are also specified:

40 CFR 93.123(b)(2): *"Where quantitative analysis methods are not available, the demonstration required by §93.116 for projects described in paragraph (b)(1) of this section must be based on a qualitative consideration of local factors."*

and

40 CFR 93.123(b)(4): "*The requirements for quantitative analysis contained in this paragraph (b) will not take effect until EPA releases modeling guidance on this subject and announces in the Federal Register that these requirements are in effect.*"

As of the date of preparation of this document, the requirements of 40 CFR 93.123(b)(4) have not as yet been fulfilled by EPA. That is, EPA has not issued "modeling guidance on this subject" and has not announced "in the Federal Register that these [quantitative analysis] requirements are in effect". Federal conformity rule requirements for hot-spot analyses for particulate are therefore at present limited to qualitative analyses only, and only for projects determined to be of air quality concern (i.e., one of the types listed under 40 CFR 93.123(b)(1)).

Table 1: National Ambient Air Quality Standards

	Primary Standards		Secondary Standards	
Pollutant	**Level**	**Averaging Time**	**Level**	**Averaging Time**
Carbon Monoxide	9 ppm (10 mg/m^3)	8-hour [1]	None	
	35 ppm (40 mg/m^3)	1-hour [1]		
Lead	0.15 µg/m^3 [2]	Rolling 3-Month Average	Same as Primary	
	1.5 µg/m^3	Quarterly Average	Same as Primary	
Nitrogen Dioxide	0.053 ppm (100 µg/m^3)	Annual (Arithmetic Mean)	Same as Primary	
Particulate Matter (PM_{10})	150 µg/m^3	24-hour [3]	Same as Primary	
Particulate Matter ($PM_{2.5}$)	15.0 µg/m^3	Annual [4] (Arithmetic Mean)	Same as Primary	
	35 µg/m^3	24-hour [5]	Same as Primary	
Ozone	0.075 ppm (2008 std)	8-hour [6]	Same as Primary	
	0.08 ppm (1997 std)	8-hour [7]	Same as Primary	
	0.12 ppm	1-hour [8] (Applies only in limited areas)	Same as Primary	
Sulfur Dioxide	0.03 ppm	Annual (Arithmetic Mean)	0.5 ppm (1300 µg/m^3)	3-hour [1]
	0.14 ppm	24-hour [1]		

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(1) Not to be exceeded more than once per year.
(2) Final rule signed October 15, 2008.
(3) Not to be exceeded more than once per year on average over 3 years.
(4) To attain this standard, the 3-year average of the weighted annual mean PM2.5 concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m3.
(5) To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m3 (effective December 17, 2006).
(6) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. (effective May 27, 2008)
(7) (a) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
(b) The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.8) (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is $\leq$ 1.
(b) As of June 15, 2005 EPA revoked the 1-hour ozone standard in all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) Areas

Source: US Environmental Protection Agency (http://www.epa.gov/air/criteria.html, accessed 05/05/09).

Project Status & Analysis Requirements

The area in which the project is located is in attainment for all of the NAAQS. As such, regional conformity requirements are not applicable.

Forecast traffic volumes exceed the threshold criteria specified in the 2009 FHWA VDOT Agreement for project-level carbon monoxide air quality analyses for NEPA documents. A worst-case analysis for CO was therefore conducted and a summary of that analysis is provided below.

The area in which the project is located is in attainment for fine particulate matter. A hot-spot analysis for fine particulate matter is therefore not required.

MSATs are addressed in this study in accordance with the 2006 federal guidance. Given relatively low projected traffic volumes, the project is of a type that would be expected to have low potential MSAT effects.

Carbon Monoxide

Modeling for CO was conducted using inputs and procedures implemented following US EPA and FHWA general guidance[6,7,8] as well as Department guidance for local (consultant) implementation[9]. Emissions and ambient concentrations were modeled, respectively, using standard US EPA models MOBILE6.2 and CAL3QHC as incorporated into or employed by interface software developed and released by the FHWA. The interface software streamlines the file preparation and modeling process and provides a ready means to test worst-case (pre-screening) scenarios for project level analyses.

The interface software package used for the emission modeling was "EMIT"[10] as updated by the FHWA in November 2007. The corresponding interface software package applied for dispersion modeling of intersections was "Cal3Interface"[11], released by the FHWA in October 2008. More information on these models may be obtained from the FHWA web site[12].

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6 "Guidelines for Modeling Carbon Monoxide from Roadway Intersections", EPA-454/R-92-005, US EPA, 1992

7 "User's Guide to CAL3QHC Version 2.0: A Modeling Methodology for Predicting Pollutant Concentrations Near Roadway Intersections", EPA-454/R-92-006 (Revised), EPA, September 1995

8 "Discussion Paper. Appropriate Level of Highway Air Quality Analysis for a CE, EA/FONSI, and EIS", FHWA, March 1986

9 "Consultant Guide. Air Quality Conformity Project-Level Analysis", VDOT Environmental Division, Air Section, May 2009

10 See "The Easy Mobile Inventory Tool – EMIT", Michael Claggett, Ph.D. (Principal Author and Model Designer), Air Quality Modeling Specialist, Federal Highway Administration Resource Center, 604 West San Mateo Road, Santa Fe, New Mexico 87505, and Jeffrey Houk, Air Quality Modeling Specialist, Federal Highway Administration Resource Center, 12300 West Dakota Avenue, Suite 340, Lakewood, Colorado 80228, dated November 2, 2006.

11 See "CAL3Interface – A Graphical User Interface for the CALINE3 and CAL3QHC Highway Air Quality Models", Michael Claggett, Ph.D., FHWA Resource Center, 12300 West Dakota Avenue, Suite 340, Lakewood, Colorado 80228, ca 2006.

12 See *http://www.fhwa.dot.gov/index.html*.

Following federal guidance for use of the Cal3Interface model, a worst-case analysis was applied for each alternative. For the widening alternative build scenario, the analysis focused on the exit 81 Interchange for the opening year 2015 and design year 2035. The exit 81 interchange is the highest volume grade separation in the project area, therefore representing the location of expected maximum concentrations of CO associated with the project; however the worst case configuration used is representative of a worst case scenario for all interchanges in the project area. The interchange was analyzed and results presented below.

For the no-build (base year) scenario, for similar reasons, the analysis focused on the intersection of the existing exit 81 Interchange. Forecasted traffic volumes and CAL3Interface worst case defaults were used in the analysis and applied for the no-build scenario.

Table 2 provides a summary of the input data applied for the emission factor modeling using MOBILE6.2 via the EMIT interface model. Input data were applied as specified in the VDOT Consultant Guide, and generally included default vehicle registration data, fuel quality (sulfur, and reid vapor pressure or RVP), and other data. Temperature data were selected as specified in the Consultant Guide and represents an average minimum monthly temperature for January. Other data such as absolute humidity were kept at EPA defaults.

Table 2: Key Input Data for MOBILE6.2

Parameter	Data
Evaluation Month	January
Min/Max Temperature (Fahrenheit)	30/30
Absolute Humidity (grains/lb)	75
Gasoline Reid Vapor Pressure (RVP)(psi)	13.5
Gasoline Sulfur	Conventional East
Vehicle Registration and Vehicle Miles Traveled by Vehicle Class	default data

Table 3 lists the emission factors generated using MOBILE6.2 (via EMIT interface). The factors were developed for roadway operating speeds as indicated. In general, the decline in emission factors for forecast years reflects the continued turnover of the on-road motor vehicle fleet to models constructed to meet more stringent emission standards. For reference, Attachment A presents the traffic forecasts.

Table 4 presents the input data applied for the dispersion modeling using CALINE3 (via the Cal3Interface model) and were selected as the Cal3Interface software defaults (for a worst-case analysis) unless otherwise noted. Ambient background concentrations for CO modeling were set at 1.7 parts per million (ppm) for the one-hour standard and 1.5 ppm for the eight-hour

standard, as specified in the memorandum "Background Carbon Monoxide (CO) Values " dated July 11, 2008. The background concentrations are those listed for rural areas.

Table 3: Emission Factors Generated with MOBILE6.2 (via the EMIT Interface Software)

Operating Condition	Base Year (2007)	Opening Year (2015)	Design Year (2035)
Operating Speed – 65 mph (grams/mile)-I-81 new location	_	8.997	7.609
Operating Speed – 65 mph (grams/mile)I-77/I-81 overlap	13.203	8.997	7.609

Table 4: Key CALINE3 (Cal3Interface) Worst-Case Analysis Inputs*

Parameter	Data
Surface Roughness Coefficient, cm	108
Background CO Concentration, ppm**	
- One-hour	1.7
- Eight-hour	1.5
Wind Speed, meters per second	1
Stability Class	4 (D – Neutral)
Mixing Height, meters	1000
Receptor Height, meters (ft)	1.8 (5.9)
Persistence Factor	0.7

* Cal3Interface Defaults unless otherwise specified.
**VDOT internal memo" Background Carbon Monoxide (CO) Values" dated July 11,2008

<u>I-77/I-81 Overlap Widening Alternative</u>

Figure 3 presents the roadway configuration for a T interchange The T-intersection layout was applied to the I-77/I-81 overlap widening scenario.

For the I-77/I-81 overlap widening build scenario, a worst-case configuration was modeled based on a 6 x 12 lane T interchange. The current (no-build) number of lanes is 4x6. The existing I-77/I-81 overlap would be widened from 6 to 8 lanes with existing 2 lane frontage roads on either side of the freeway. The 6x12 build scenario includes the frontage roads as well as additional lanes of traffic for I-77 over that proposed and concentrates traffic at the grade

separation thus representing a greater worst-case scenario for modeling purposes. Operating speeds were taken as 65 mph for I-77 and I77/I-81 overlap as well as frontage roads.

Worst-case traffic volumes were modeled for the opening and design years and were set to reflect at-capacity operating conditions, consistent with guidance provided with the FHWA Cal3Interface model. The worst case volumes were assumed to be 2200 vehicles per hour per lane (vphpl) for each link.

The peak traffic volumes for the 6 approach lanes (i.e., one direction only) would be 13,200 vehicles per hour for I-81 and 6600 vehicles per hour for the 3 approach lanes on I-77. This significantly exceeds the estimated (two-way) 7539 vehicles design-hour volume forecast for the I-77/I-81 overlap, and so provides a useful basis for the worst-case analysis.

As indicated in the FHWA guidance for the Cal3Interface software, this configuration includes twelve foot lanes and a minimum right of way of twenty feet was applied. The roadways are modeled with a source height of zero.

The receptor locations were as specified in the Cal3Interface software package for the worst-case scenario for this roadway configuration. Receptors were located at each corner, three meters from each intersecting roadway; along each side of the intersecting roadways at twenty-five meters and fifty meters from the corner; and at the midpoint on each side of the intersecting roadways. The option of having the model locate the worst-case wind direction for each receptor was applied to ensure that the maximum possible CO concentrations were identified.

Figure 3: Cal3Interface Pre-Screen Worst-Case Scenario Receptor Locations (Grade Separation)

Source: (Receptor Link Locations /

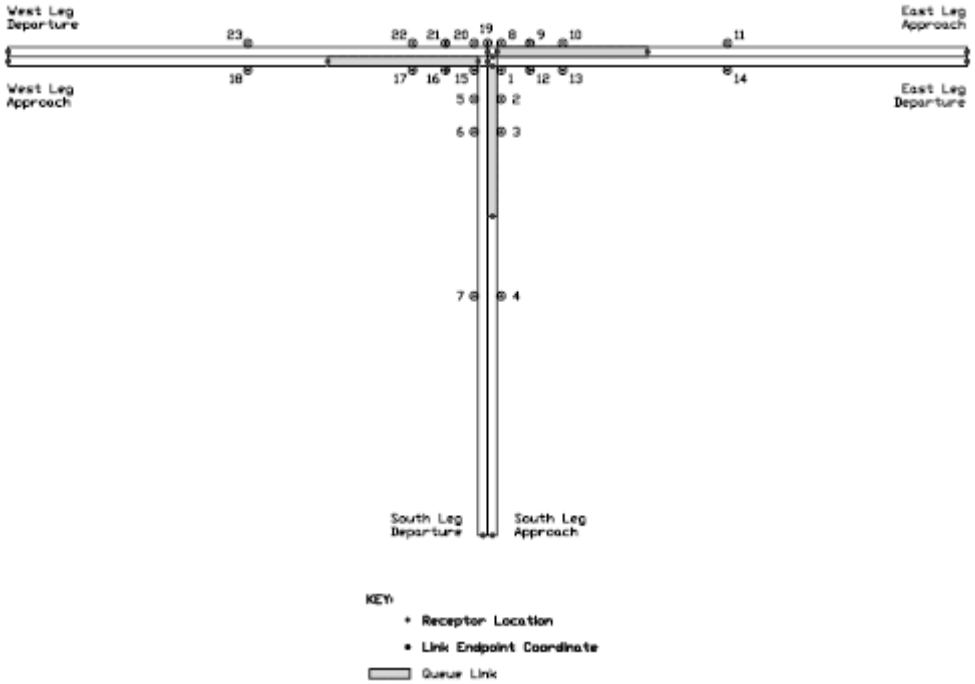


Figure 2.5 Locations / Receptor Link

Configurations of the Pre-Defined 2-Way, 3-Leg Intersection Option reproduced from "CAL3Interface – A Graphical User Interface for the CALINE3 and CAL3QHC Highway Air Quality Models", Michael Claggett, Ph.D., FHWA Resource Center, 12300 West Dakota Avenue, Suite 340, Lakewood, Colorado, ca 2006.

I-81 - New Alignment Alternative

Figure 4 presents the roadway configuration and receptor locations for a 4-way grade separated freeway as provided in the FHWA Cal3Interface guidance. The 4 –way layout was applied for the proposed I-77/I-81 Interchange.

For the new alignment build scenario, a worst-case configuration was modeled based on a 6x14 lane grade separated 4-way interchange. The current (no-build) number of lanes is 4x6 for the I-77/I-81 overlap (Figure 2). The existing I-77/I-81 overlap would remain 6 lanes with the existing 2 lane frontage roads and a separate 4 lane road would be constructed on new alignment to carry the I-81 traffic. The 6x14 build scenario includes the existing 6 lane overlap, frontage roads, 4 lanes on new alignment as well as additional lanes of traffic on I -77 over that proposed and concentrates traffic at the grade separation thus representing a greater worst-case scenario for modeling purposes. Operating speeds were taken as 65 mph for both I-77 and I-81.

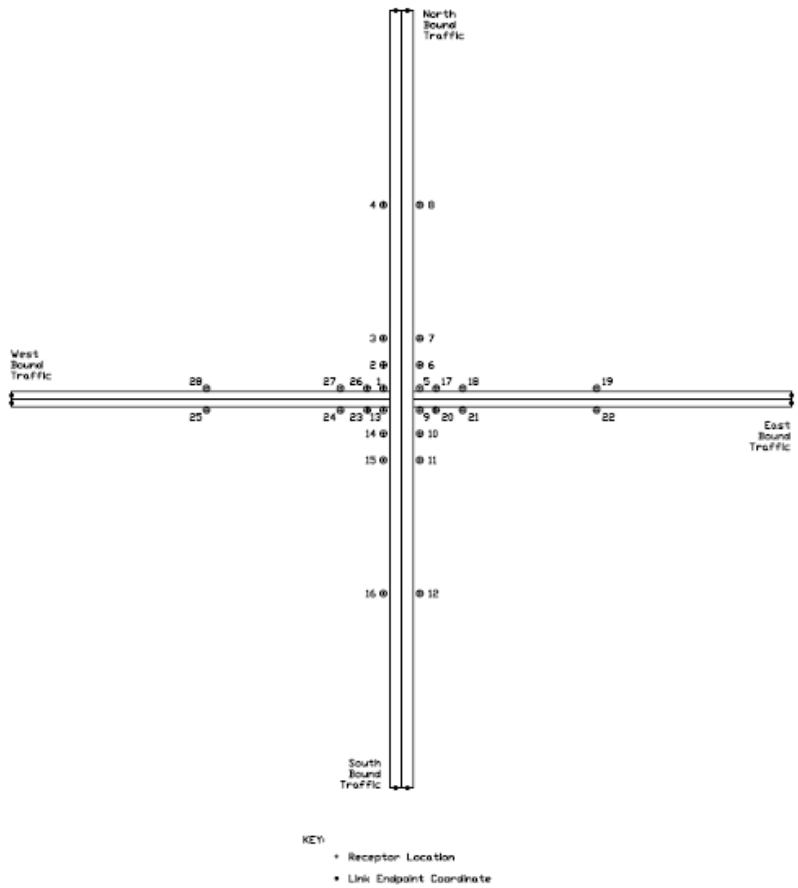
Worst-case traffic volumes were modeled for the opening and design years and were set to reflect at-capacity operating conditions, consistent with guidance provided with the FHWA Cal3Interface model. The worst case volumes were assumed to be 2200 vehicles per hour per lane (vphpl) for each freeway link.

The peak traffic volumes for the 7 approach lanes (i.e., one direction only) would be 15,400 vehicles per hour for I-81 and 3 lanes would be 6,600 for I-77. This significantly exceeds the estimated (two-way) 7539 vehicles design-hour volume forecast for the I-77/I-81 overlap and so provides a useful basis for the worst-case analysis.

As indicated in the FHWA guidance for the Cal3Interface software, this configuration includes twelve foot lanes and a minimum right of way of twenty feet was applied. The roadways are modeled as a freeway grade separation with a source height of zero.

The receptor locations were as specified in the Cal3Interface software package for the worst-case scenario for this roadway configuration. Receptors were located at each corner, three meters from each intersecting roadway; along each side of the intersecting roadways at twenty-five meters and fifty meters from the corner; and at the midpoint on each side of the intersecting roadways. The option of having the model locate the worst-case wind direction for each receptor was applied to ensure that the maximum possible CO concentrations were identified.

Figure 4: Cal3Interface Pre-Screen Worst-Case Scenario Receptor Locations (Grade Separation)



Source: Figure 2.2 (Receptor Locations / Link Configurations of the Pre-Defined Grade-Separated Crossover Freeway Option) reproduced from "CAL3Interface – A Graphical User Interface for the CALINE3 and CAL3QHC Highway Air Quality Models", Michael Claggett, Ph.D., FHWA Resource Center, 12300 West Dakota Avenue, Suite 340, Lakewood, Colorado, ca 2006.

Table 5 presents the forecast maximum concentrations for CO. The overall forecast maximum or peak concentrations occur in the opening year (2015) for the 6x14 worst-case build scenario for the I-81 new location scenario with the Cal3Interface model default traffic volumes, and are 11.5 and 8.4 ppm, respectively, for the one-hour and eight-hour periods. This forecast includes the assumed background concentrations of 1.7 ppm for the one-hour standard and 1.5 ppm for the eight-hour standard as noted previously.

Peak CO concentrations forecast for the design year (2035) using the same 6x14 worst-case configuration for the I-81 new location scenario and Cal3Interface model default were 10.1 and 7.4 ppm for the one-hour and eight-hour standards, respectively. The continued fleet turnover

to vehicles constructed to more stringent emission standards leads to reduced emissions in forecast years.

Forecast peak concentrations for the base year (2007) using forecasted traffic and CAL3Interface worst case defaults for the no-build scenario, which is a 4x6 configuration as indicated previously, are 10.7 and 7.8 ppm, respectively, for the one- and eight-hour standards.

For all scenarios, the forecast peak concentrations of CO are below the respective one-hour and eight-hour standards of 35 and 9 ppm, respectively.

The results indicate that, despite the assumption of worst-case traffic conditions for the opening and design years, ambient levels of CO in the vicinity of the project are expected to remain below both the one-hour and the eight-hour NAAQS. The project therefore is not expected to cause or contribute to a violation of the CO standards.

Table 5: Forecast Maximum CO Concentrations (ppm)

WORST-CASE SCENARIO:	**One-hour Standard (35 ppm)**	**Eight-hour Standard (9ppm)**
Design Year (2035):		
6x12 widening T-Int. @ Def.Cal3Interface Worst Case volumes (I-77/I-81)	9.7 (receptor 2)	7.1 (receptor 2)
6x14 4 way-Int. @ Def.Cal3Interface Worst Case volumes (I-77/I-81 new location)	10.1 (receptor 1)	7.4 (receptor 1)
Opening Year (2015):		
6x12 widening T-Int. @ Def.Cal3Interface Worst Case volumes (I-77/I-81)	11.1 (receptor2)	8.1 (receptor 2)
6x14 4 way-Int. @ Def.Cal3Interface Worst Case volumes (I-77/I-81 new location)	11.5 (receptor 1)	8.4 (receptor1)
Base year (2007):		
4x6 existing T-Int. @ Exit 81 I-77/I-81 w/ modeled volumes.	10.7 (receptor 2)	7.8 (receptor 2)

Mobile Source Air Toxics (MSATs)

The FHWA Interim Guidance issued February 3, 2006 establishes a three-tiered approach to determine the level of analysis needed for MSATs in a project-level study. These tiers or levels are reviewed below, using text from the guidance. The project is assessed in relation to the guidance following this review.

(1) Exempt Projects or Projects with No Meaningful Potential MSAT Effects.

The types of projects included in this category are:

- Projects qualifying as a categorical exclusion under 23 CFR 771.117(c);
- Projects exempt under the Clean Air Act conformity rule under 40 CFR 93.126; or
- Other projects with no meaningful impacts on traffic volumes or vehicle mix

Additionally, the guidance indicates that, "[f]or projects with no or negligible traffic impacts, regardless of the class of NEPA environmental document, no MSAT analysis is required." It is further noted in the guidance that "[t]he types of projects categorically excluded under 23 CFR 771.117(d) or exempt from conformity rule under 40 CFR 93.127 do not warrant an automatic exemption from an MSAT analysis, but they usually will have no meaningful impact."

Projects in this category do not require either a qualitative or a quantitative analysis for MSATS, although documentation of the project category is required.

(2) Projects with Low Potential MSAT Effects

The types of projects included in this category are those that serve to improve operations of highway, transit or freight without adding substantial new capacity or without creating a facility that is likely to meaningfully increase emissions. This category covers a broad range of projects. Examples of these types of projects are minor widening projects and new interchanges, such as those that replace a signalized intersection on a surface street or where design year traffic is not projected to meet the 140,000 to 150,000 AADT criteria.

Projects in this category are to be addressed with a qualitative analysis following the guidance provided by FHWA.

(3) Projects with Higher Potential MSAT Effects

The types of projects in this category must:

- Create or significantly alter a major intermodal freight facility that has the potential to concentrate high levels of diesel particulate matter in a single location; or

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

AND

- Be 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).

Projects in this category would be more rigorously assessed for impacts.

Traffic forecasts for this project are significantly less than the 140,000 to 150,000 AADT threshold specified in the federal guidance for a Category 3 project (*Projects with Higher Potential MSAT Effects*). However, as the project involves the widening or addition of separate lanes of an existing highway, it falls into the second category, i.e., those with "*Low Potential MSAT Effects*".

As noted above, projects in the second category are addressed with a qualitative analysis following the guidance provided by FHWA. A qualitative analysis consistent with federal guidance is therefore provided below for this project.

In addition to the criteria air pollutants for which there are national ambient air quality standards, 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).

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act. 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. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

The EPA is the lead Federal Agency for administering the Clean Air Act and has certain responsibilities regarding the health effects of MSATs. The EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources. 66 FR 17229 (March 29, 2001). This rule was issued under the authority in Section 202 of the Clean Air Act. In its rule, EPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline (RFG) program, its national low emission vehicle (NLEV) standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 2000 and 2020, FHWA projects that even with a 64 percent increase in VMT, these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 percent to 65 percent, and will reduce on-highway diesel PM emissions by 87 percent, as shown in the graph below.

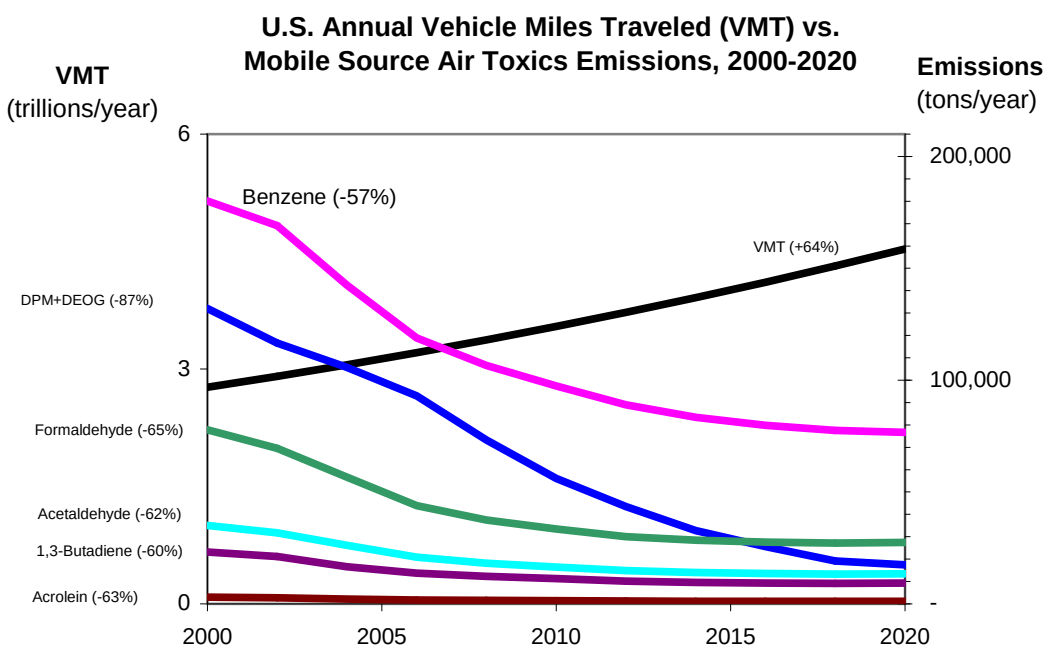
As a result, EPA concluded that no further motor vehicle emissions standards or fuel standards were necessary to further control MSATs. The agency is preparing another rule under authority

of CAA Section 202(l) that will address these issues and could make adjustments to the full 21 and the primary six MSATs[13].

Unavailable Information for Project Specific MSAT Impact Analysis

This document includes a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable prediction of the health impacts of the emission changes associated with the project. Due to these limitations, the following discussion is included in accordance with Council of Environmental Quality (CEQ) regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information:

Figure 5: U.S. Annual Vehicle Miles Traveled vs. Mobile Source Air Toxics Emissions 2000-2020



Notes: For on-road mobile sources. Emissions factors were generated using MOBILE6.2. MTBE proportion of market for oxygenates is held constant, at 50%. Gasoline RVP and oxygenate content are held constant. VMT: *Highway Statistics 2000*, Table VM-2 for 2000, analysis assumes annual growth rate of 2.5%. "DPM + DEOG" is based on MOBILE6.2-generated factors for elemental carbon, organic carbon and SO4 from diesel-powered vehicles, with the particle size cutoff set at 10.0 microns.

13 On February 9, 2007, EPA announced that it is issuing a final rule for the "Control of Hazardous Air Pollutants from Mobile Sources". The EPA fact sheet (EPA420-F-07-017) released for the final rule states: "The final standards will significantly lower emissions of benzene and the other air toxics in three ways: (1) by lowering benzene content in gasoline; (2) by reducing exhaust emissions from passenger vehicles operated at cold temperatures (under 75 degrees); and (3) by reducing emissions that evaporate from, and permeate through, portable fuel containers." Thus, although the graph provided in the text only forecasts emissions through 2020, EPA's new MSAT2 Rule should result in additional emission reductions beyond 2020 that were not envisioned when the MSAT1 Rule or this graph were developed.

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.

1. 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 particulate matter, 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. These deficiencies compromise the capability of MOBILE 6.2 to estimate MSAT emissions. MOBILE6.2 is an adequate tool for projecting emissions trends, and performing relative analyses between alternatives for very large projects, but it is not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations.

2. 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. 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 (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.

3. 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 non-cancer 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[14]. 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 or 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

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14 South Coast Air Quality Management District, Multiple Air Toxic Exposure Study-II (2000); Highway Health Hazards, The Sierra Club (2004) summarizing 24 Studies on the relationship between health and air quality); NEPA's Uncertainty in the Federal Legal Scheme Controlling Air Pollution from Motor Vehicles, Environmental Law Institute, 35 ELR 10273 (2005) with health studies cited therein.

do allow a reasonable prediction of relative emissions changes between alternatives for larger projects, the amount of MSAT emissions from this project and MSAT concentrations or exposures created by this project 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 this project would have "significant adverse impacts on the human environment."

In this document, FHWA provides a qualitative assessment and acknowledges that the project may result in increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated.

As discussed above, technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. However, even though reliable methods do not exist to accurately estimate the health impacts of MSATs at the project level, it is possible to qualitatively assess the levels of future MSAT emissions under the project. The qualitative assessment presented is derived in part from a study conducted by the FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*, which may be obtained from the FHWA website (http://www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm).

Emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent from 2000 to 2020. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in virtually all locations.

Accordingly, for this project, there may be localized areas where VMT would increase, and other areas where VMT would decrease. Therefore it is possible that localized increases and decreases in MSAT emissions may occur. However, even if these increases do occur, they too will be substantially reduced in the future due to implementation of EPA's vehicle and fuel regulations.

In sum, in the design year it is expected that MSAT levels could be higher in some locations than others, but current tools and science are not adequate to quantify them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

Construction & Other Potential Impacts

Comments provided by the VDEQ (or DEQ) in relation to the State Environmental Review Process (SERP) for project located in Wythe County, Virginia[15] are as follows:

This project lies in an area that is currently in attainment with all of the National Ambient Air Quality Standards (NAAQS). The following DEQ air pollution regulations must be adhered to during the construction of this project: 9 VAC 5-50-60 et seq., Fugitive Dust precautions; and 9 VAC 5-40-5600 et seq., Open Burning precautions.

Emissions may be produced in the construction of this project from heavy equipment and vehicle travel to and from the site, as well as from fugitive sources. Construction emissions are short term or temporary in nature. In order to mitigate these emissions, all construction activities are to be performed in accordance with VDOT *Road and Bridge Specifications*.

Conclusion

This project has been assessed for potential air quality impacts and conformity with applicable air quality regulations and requirements. The CO analysis presented herein demonstrated that the proposed project, if built according to the conceptual designs, would not cause or contribute to a violation of the air quality standards for Carbon Monoxide outlined in the NAAQS. Additionally, best available information indicates that, nationwide, regional levels of air toxics are expected to decrease in the future due to fleet turnover and the continued implementation of more stringent emission and fuel quality regulations. Nevertheless, it is possible that some localized areas may show an increase in emissions and ambient levels of these pollutants due to locally increased traffic levels associated with the project.

The assessment indicates that the project would meet all applicable air quality analysis and conformity requirements. As such, it will not cause or contribute to a violation or delay timely attainment of the national ambient air quality standards (NAAQS).

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15 "DEQ SERP Comments Rev3", spreadsheet listing DEQ comments by county, dated June 29, 2007.

Attachment A

Traffic Forecasts

Annual Growth Rate PC = % Existing Yr=
HV = % No Build Yr=
Build Yr =

Existing 2007 I-77/I-81 Mainline North of Exit 81 **NORTHBOUND**

DAILY NB VOLUME
19,000

	Combined										
Start Time	% of Daily	Total Vol	PC %	PC	All Trucks	Truck%	2A Truck%	2A Total	3A+%	3A+ Total	
12:00 AM	1.5%	279	67.8%	189	90	32.2%	0.5%	1	31.8%	89	
1:00 AM	1.2%	224	63.8%	143	81	36.2%	1.0%	2	35.2%	79	
2:00 AM	1.2%	234	58.5%	137	97	41.5%	0.4%	1	41.1%	96	
3:00 AM	1.1%	208	58.5%	122	86	41.5%	1.1%	2	40.4%	84	
4:00 AM	1.3%	249	64.2%	160	89	35.8%	0.7%	2	35.1%	87	
5:00 AM	1.7%	324	73.4%	238	86	26.6%	0.4%	1	26.1%	85	
6:00 AM	2.5%	474	81.8%	388	86	18.2%	0.6%	3	17.6%	83	
7:00 AM	3.6%	685	85.4%	585	100	14.6%	0.5%	3	14.1%	96	
8:00 AM	4.2%	789	83.2%	656	132	16.8%	1.0%	8	15.7%	124	
9:00 AM	4.9%	927	83.9%	778	149	16.1%	1.0%	9	15.1%	140	
10:00 AM	5.9%	1,115	84.6%	943	172	15.4%	0.8%	9	14.6%	163	
11:00 AM	6.4%	1,214	84.7%	1,027	186	15.3%	0.7%	9	14.6%	178	
12:00 PM	6.5%	1,227	85.5%	1,050	177	14.5%	0.8%	10	13.6%	167	
1:00 PM	6.6%	1,254	86.0%	1,078	176	14.0%	0.9%	11	13.2%	165	
2:00 PM	7.6%	1,442	87.8%	1,266	176	12.2%	0.9%	13	11.3%	163	
3:00 PM	8.0%	1,517	88.1%	1,335	181	11.9%	0.9%	13	11.1%	168	
4:00 PM	7.8%	1,476	86.9%	1,283	193	13.1%	0.7%	10	12.4%	184	
5:00 PM	7.0%	1,331	86.1%	1,145	186	13.9%	0.7%	9	13.2%	176	
6:00 PM	5.4%	1,035	81.9%	848	187	18.1%	0.8%	8	17.3%	179	
7:00 PM	4.5%	854	78.3%	669	185	21.7%	0.6%	5	21.1%	180	
8:00 PM	3.7%	708	76.1%	539	169	23.9%	0.4%	3	23.5%	167	
9:00 PM	3.2%	603	72.7%	439	165	27.3%	0.5%	3	26.8%	162	
10:00 PM	2.4%	452	67.1%	303	149	32.9%	0.4%	2	32.5%	147	
11:00 PM	2.0%	378	63.2%	239	139	36.8%	0.5%	2	36.3%	137	
		19,000		15,560	3,440						

Existing 2007 I-77/I-81 Mainline North of Exit 81 **SOUTHBOUND**

DAILY SB VOLUME
17,900

	Combined										
Start Time	% of Daily	Vol	PC %	PC	All Trucks	Truck%	2A Truck%	2A Total	3A+%	3A+ Total	
12:00 AM	1.4%	242	61.2%	148	94	38.8%	1.0%	2	37.8%	92	
1:00 AM	1.0%	186	59.2%	110	76	40.8%	1.1%	2	39.7%	74	
2:00 AM	0.8%	144	54.2%	78	66	45.8%	1.3%	2	44.5%	64	
3:00 AM	0.8%	148	53.3%	79	69	46.7%	0.8%	1	45.9%	68	
4:00 AM	1.0%	182	57.4%	105	78	42.6%	1.6%	3	41.0%	75	
5:00 AM	1.5%	270	68.9%	186	84	31.1%	1.1%	3	30.1%	81	
6:00 AM	2.6%	463	75.3%	349	114	24.7%	1.5%	7	23.2%	108	
7:00 AM	4.1%	738	82.0%	605	133	18.0%	1.3%	9	16.8%	124	
8:00 AM	5.2%	933	82.5%	770	164	17.5%	1.5%	14	16.1%	150	
9:00 AM	5.5%	986	81.6%	805	181	18.4%	1.4%	14	16.9%	167	
10:00 AM	6.2%	1,107	81.6%	903	204	18.4%	1.3%	14	17.1%	190	
11:00 AM	6.8%	1,215	82.0%	996	219	18.0%	1.4%	17	16.6%	201	
12:00 PM	6.8%	1,218	81.1%	988	230	18.9%	1.2%	15	17.7%	215	
1:00 PM	6.8%	1,221	79.7%	973	248	20.3%	1.2%	15	19.1%	234	
2:00 PM	7.1%	1,269	79.7%	1,011	257	20.3%	1.0%	13	19.3%	245	
3:00 PM	7.1%	1,270	79.2%	1,006	264	20.8%	1.0%	13	19.8%	251	
4:00 PM	7.0%	1,245	77.9%	970	275	22.1%	1.1%	14	21.0%	261	
5:00 PM	6.7%	1,206	76.2%	920	287	23.8%	0.9%	11	22.8%	275	
6:00 PM	5.8%	1,035	73.7%	762	272	26.3%	0.9%	9	25.5%	263	
7:00 PM	4.6%	824	69.0%	569	255	31.0%	0.8%	6	30.2%	249	
8:00 PM	3.7%	661	65.7%	434	226	34.3%	0.8%	5	33.5%	221	
9:00 PM	3.2%	567	61.6%	349	218	38.4%	0.9%	5	37.5%	213	
10:00 PM	2.4%	433	57.6%	250	184	42.4%	0.7%	3	41.7%	181	
11:00 PM	1.9%	336	52.2%	175	161	47.8%	0.7%	2	47.1%	158	
		17,900		13,541	4,359						

Annual Growth Rate PC = % Existing Yr=
HV = % No Build Yr=
Build Yr =

No Build and Widening 2015 I-77/I-81 Mainline Exit 80-81 **NORTHBOUND**

DAILY NB VOLUME
35,650

	Combined									
Start Time	% of Daily	Total Vol	PC %	PC	All Trucks	Truck%	2A Truck%	2A Total	3A+%	3A+ Total
12:00 AM	1.5%	524	67.8%	355	169	32.2%	0.5%	2	31.8%	167
1:00 AM	1.2%	421	63.8%	269	153	36.2%	1.0%	4	35.2%	148
2:00 AM	1.2%	440	58.5%	257	183	41.5%	0.4%	2	41.1%	181
3:00 AM	1.1%	390	58.5%	228	162	41.5%	1.1%	4	40.4%	158
4:00 AM	1.3%	467	64.2%	300	167	35.8%	0.7%	3	35.1%	164
5:00 AM	1.7%	608	73.4%	446	162	26.6%	0.4%	3	26.1%	159
6:00 AM	2.5%	890	81.8%	727	162	18.2%	0.6%	6	17.6%	157
7:00 AM	3.6%	1,285	85.4%	1,098	187	14.6%	0.5%	6	14.1%	181
8:00 AM	4.2%	1,480	83.2%	1,232	248	16.8%	1.0%	15	15.7%	233
9:00 AM	4.9%	1,739	83.9%	1,459	280	16.1%	1.0%	17	15.1%	263
10:00 AM	5.9%	2,093	84.6%	1,770	323	15.4%	0.8%	16	14.6%	306
11:00 AM	6.4%	2,277	84.7%	1,928	349	15.3%	0.7%	16	14.6%	333
12:00 PM	6.5%	2,303	85.5%	1,970	333	14.5%	0.8%	19	13.6%	313
1:00 PM	6.6%	2,353	86.0%	2,022	330	14.0%	0.9%	20	13.2%	310
2:00 PM	7.6%	2,706	87.8%	2,375	331	12.2%	0.9%	25	11.3%	306
3:00 PM	8.0%	2,846	88.1%	2,506	340	11.9%	0.9%	25	11.1%	315
4:00 PM	7.8%	2,770	86.9%	2,407	363	13.1%	0.7%	19	12.4%	344
5:00 PM	7.0%	2,497	86.1%	2,149	348	13.9%	0.7%	18	13.2%	330
6:00 PM	5.4%	1,943	81.9%	1,591	352	18.1%	0.8%	15	17.3%	336
7:00 PM	4.5%	1,602	78.3%	1,255	348	21.7%	0.6%	10	21.1%	337
8:00 PM	3.7%	1,329	76.1%	1,011	318	23.9%	0.4%	5	23.5%	313
9:00 PM	3.2%	1,132	72.7%	823	309	27.3%	0.5%	6	26.8%	303
10:00 PM	2.4%	848	67.1%	569	279	32.9%	0.4%	3	32.5%	276
11:00 PM	2.0%	708	63.2%	448	260	36.8%	0.5%	4	36.3%	257
		35,650		29,195	6,455					

No Build and Widening 2015 I-77/I-81 Mainline Exit 80-81 **SOUTHBOUND**

DAILY SB VOLUME
35,700

	Combined									
Start Time	% of Daily	Vol	PC %	PC	All Trucks	Truck%	2A Truck%	2A Total	3A+%	3A+ Total
12:00 AM	1.4%	483	61.2%	295	188	38.8%	1.0%	5	37.8%	183
1:00 AM	1.0%	372	59.2%	220	152	40.8%	1.1%	4	39.7%	148
2:00 AM	0.8%	287	54.2%	156	132	45.8%	1.3%	4	44.5%	128
3:00 AM	0.8%	296	53.3%	157	138	46.7%	0.8%	2	45.9%	136
4:00 AM	1.0%	364	57.4%	209	155	42.6%	1.6%	6	41.0%	149
5:00 AM	1.5%	538	68.9%	370	167	31.1%	1.1%	6	30.1%	162
6:00 AM	2.6%	924	75.3%	696	228	24.7%	1.5%	14	23.2%	215
7:00 AM	4.1%	1,473	82.0%	1,207	265	18.0%	1.3%	18	16.8%	247
8:00 AM	5.2%	1,862	82.5%	1,535	326	17.5%	1.5%	27	16.1%	299
9:00 AM	5.5%	1,967	81.6%	1,605	361	18.4%	1.4%	28	16.9%	333
10:00 AM	6.2%	2,208	81.6%	1,801	407	18.4%	1.3%	28	17.1%	379
11:00 AM	6.8%	2,423	82.0%	1,986	436	18.0%	1.4%	35	16.6%	402
12:00 PM	6.8%	2,429	81.1%	1,970	459	18.9%	1.2%	29	17.7%	430
1:00 PM	6.8%	2,436	79.7%	1,941	495	20.3%	1.2%	29	19.1%	466
2:00 PM	7.1%	2,530	79.7%	2,017	514	20.3%	1.0%	25	19.3%	488
3:00 PM	7.1%	2,533	79.2%	2,006	527	20.8%	1.0%	26	19.8%	501
4:00 PM	7.0%	2,483	77.9%	1,935	548	22.1%	1.1%	27	21.0%	521
5:00 PM	6.7%	2,406	76.2%	1,834	571	23.8%	0.9%	22	22.8%	549
6:00 PM	5.8%	2,063	73.7%	1,520	543	26.3%	0.9%	18	25.5%	525
7:00 PM	4.6%	1,643	69.0%	1,134	509	31.0%	0.8%	13	30.2%	496
8:00 PM	3.7%	1,317	65.7%	866	451	34.3%	0.8%	10	33.5%	442
9:00 PM	3.2%	1,131	61.6%	696	435	38.4%	0.9%	10	37.5%	425
10:00 PM	2.4%	864	57.6%	498	366	42.4%	0.7%	6	41.7%	361
11:00 PM	1.9%	670	52.2%	350	320	47.8%	0.7%	5	47.1%	316
		35,700		27,006	8,694					

Annual Growth Rate PC = % Existing Yr=
HV = % No Build Yr=
Build Yr =

No Build and Widening 2035 I-77/I-81 Mainline Exit 80-81 **NORTHBOUND**

DAILY NB VOLUME
50,000

	Combined										
Start Time	% of Daily	Vol	PC %	PC	All Trucks	Truck%	2A Truck%	2A Total	3A+%	3A+ Total	
12:00 AM	1.5%	735	67.8%	498	237	32.2%	0.5%	3	31.8%	234	
1:00 AM	1.2%	591	63.8%	377	214	36.2%	1.0%	6	35.2%	208	
2:00 AM	1.2%	617	58.5%	361	256	41.5%	0.4%	2	41.1%	254	
3:00 AM	1.1%	547	58.5%	320	227	41.5%	1.1%	6	40.4%	221	
4:00 AM	1.3%	656	64.2%	421	235	35.8%	0.7%	5	35.1%	230	
5:00 AM	1.7%	853	73.4%	626	227	26.6%	0.4%	4	26.1%	223	
6:00 AM	2.5%	1,248	81.8%	1,020	228	18.2%	0.6%	8	17.6%	220	
7:00 AM	3.6%	1,803	85.4%	1,540	262	14.6%	0.5%	9	14.1%	253	
8:00 AM	4.2%	2,075	83.2%	1,728	348	16.8%	1.0%	21	15.7%	327	
9:00 AM	4.9%	2,439	83.9%	2,046	392	16.1%	1.0%	23	15.1%	369	
10:00 AM	5.9%	2,935	84.6%	2,482	453	15.4%	0.8%	23	14.6%	430	
11:00 AM	6.4%	3,194	84.7%	2,704	490	15.3%	0.7%	23	14.6%	467	
12:00 PM	6.5%	3,230	85.5%	2,763	467	14.5%	0.8%	27	13.6%	440	
1:00 PM	6.6%	3,300	86.0%	2,836	463	14.0%	0.9%	28	13.2%	435	
2:00 PM	7.6%	3,795	87.8%	3,330	464	12.2%	0.9%	35	11.3%	429	
3:00 PM	8.0%	3,991	88.1%	3,514	477	11.9%	0.9%	35	11.1%	442	
4:00 PM	7.8%	3,885	86.9%	3,376	509	13.1%	0.7%	26	12.4%	483	
5:00 PM	7.0%	3,502	86.1%	3,013	488	13.9%	0.7%	25	13.2%	463	
6:00 PM	5.4%	2,725	81.9%	2,232	493	18.1%	0.8%	21	17.3%	472	
7:00 PM	4.5%	2,248	78.3%	1,760	487	21.7%	0.6%	14	21.1%	473	
8:00 PM	3.7%	1,864	76.1%	1,418	446	23.9%	0.4%	7	23.5%	439	
9:00 PM	3.2%	1,588	72.7%	1,155	434	27.3%	0.5%	8	26.8%	425	
10:00 PM	2.4%	1,189	67.1%	798	391	32.9%	0.4%	5	32.5%	387	
11:00 PM	2.0%	994	63.2%	628	365	36.8%	0.5%	5	36.3%	360	
		50,000		40,946	9,054						

No Build 2035 and Widening I-77/I-81 Mainline Exit 80-81 **SOUTHBOUND**

DAILY SB VOLUME
50,000

	Combined										
Start Time	% of Daily	Vol	PC %	PC	All Trucks	Truck%	2A Truck%	2A Total	3A+%	3A+ Total	
12:00 AM	1.4%	676	61.2%	413	263	38.8%	1.0%	7	37.8%	256	
1:00 AM	1.0%	521	59.2%	308	213	40.8%	1.1%	6	39.7%	207	
2:00 AM	0.8%	403	54.2%	218	185	45.8%	1.3%	5	44.5%	179	
3:00 AM	0.8%	414	53.3%	221	193	46.7%	0.8%	3	45.9%	190	
4:00 AM	1.0%	509	57.4%	293	217	42.6%	1.6%	8	41.0%	209	
5:00 AM	1.5%	753	68.9%	519	234	31.1%	1.1%	8	30.1%	226	
6:00 AM	2.6%	1,294	75.3%	974	320	24.7%	1.5%	19	23.2%	300	
7:00 AM	4.1%	2,063	82.0%	1,691	371	18.0%	1.3%	26	16.8%	346	
8:00 AM	5.2%	2,607	82.5%	2,150	457	17.5%	1.5%	38	16.1%	419	
9:00 AM	5.5%	2,754	81.6%	2,248	506	18.4%	1.4%	39	16.9%	467	
10:00 AM	6.2%	3,092	81.6%	2,523	569	18.4%	1.3%	39	17.1%	530	
11:00 AM	6.8%	3,393	82.0%	2,782	611	18.0%	1.4%	48	16.6%	563	
12:00 PM	6.8%	3,402	81.1%	2,759	643	18.9%	1.2%	41	17.7%	602	
1:00 PM	6.8%	3,411	79.7%	2,718	693	20.3%	1.2%	41	19.1%	652	
2:00 PM	7.1%	3,544	79.7%	2,825	719	20.3%	1.0%	35	19.3%	684	
3:00 PM	7.1%	3,548	79.2%	2,809	738	20.8%	1.0%	37	19.8%	702	
4:00 PM	7.0%	3,478	77.9%	2,711	767	22.1%	1.1%	38	21.0%	729	
5:00 PM	6.7%	3,369	76.2%	2,569	800	23.8%	0.9%	31	22.8%	769	
6:00 PM	5.8%	2,890	73.7%	2,129	760	26.3%	0.9%	25	25.5%	736	
7:00 PM	4.6%	2,301	69.0%	1,588	713	31.0%	0.8%	18	30.2%	695	
8:00 PM	3.7%	1,845	65.7%	1,213	632	34.3%	0.8%	14	33.5%	618	
9:00 PM	3.2%	1,585	61.6%	975	609	38.4%	0.9%	15	37.5%	595	
10:00 PM	2.4%	1,210	57.6%	697	513	42.4%	0.7%	8	41.7%	505	
11:00 PM	1.9%	939	52.2%	490	449	47.8%	0.7%	6	47.1%	442	
		50,000		37,824	12,176						

Air and Noise Modeling Traffic Forecast Data

2007 Existing Interchange 72 Data

	AM Percentages					PM Percentages						2007 AM Volumes				2007 PM Volumes				2007 Design Hour	
Loc_Name	Total % of Daily	PC%	HV%	2A%	3A%	Total % of Daily	PC%	HV%	2A%	3A%	2007 Daily Volume	PC	HV	2A	3A	PC	HV	2A	3A	LOS	Posted Speed
I-81 Exit 072 NB Off-ramp to I77NB--Southbound	4.98%	68.42%	31.58%	3.16%	28.42%	8.47%	69.07%	30.93%	3.09%	27.84%	3,500	119	55	6	50	205	92	9	83	A	25
I-81 Exit 072 NB On-ramp from I77 SB--Westbound	4.79%	63.86%	36.14%	3.61%	32.53%	6.06%	69.05%	30.95%	3.10%	27.86%	13,000	398	225	23	203	544	244	24	219	B	50
I-81 Exit 072 SB Off-ramp to I77SB--Westbound	5.16%	62.55%	37.45%	3.75%	33.71%	7.27%	58.54%	41.46%	4.15%	37.32%	13,000	420	251	25	226	553	392	39	353	A	50
I-81 Exit 072 SB On-ramp from I77 SB--Westbound	5.24%	58.72%	41.28%	4.13%	37.15%	6.06%	57.77%	42.23%	4.22%	38.01%	3,500	108	76	8	68	123	90	9	81	A	35

2007 Existing Interchange 73 Data

	AM Percentages					PM Percentages						2007 AM Volumes				2007 PM Volumes				2007 Design Hour	
Loc_Name	Total % of Daily	PC%	HV%	2A%	3A%	Total % of Daily	PC%	HV%	2A%	3A%	2007 Daily Volume	PC	HV	2A	3A	PC	HV	2A	3A	LOS	Posted Speed
I-81 Exit 073 NB Off-ramp @ Rt 11 SB	9.17%	92.81%	7.19%	1.42%	5.77%	7.46%	92.92%	7.08%	1.75%	5.33%	1,500	128	10	2	8	104	8	2	6	B	N/A
I-81 Exit 073 NB On-ramp @ Rt 11 NB	5.37%	91.12%	8.88%	2.31%	6.57%	9.60%	95.56%	4.44%	2.07%	2.37%	4,000	196	19	5	14	367	17	8	9	B	25
I-81 Exit 073 SB Off-ramp @ Rt 11	8.98%	94.74%	5.26%	3.73%	1.53%	8.36%	94.94%	5.06%	2.87%	2.19%	4,200	357	20	14	6	333	18	10	8	B	40
I-81 Exit 073 SB On-ramp @ Rt 11	6.16%	89.02%	10.98%	4.70%	6.28%	9.02%	97.50%	2.50%	0.80%	1.70%	1,400	77	9	4	5	123	3	1	2	A	N/A

2007 Existing Interchange 77 Data

	AM Percentages					PM Percentages						2007 AM Volumes				2007 PM Volumes				2007 Design Hour	
Loc_Name	Total % of Daily	PC%	HV%	2A%	3A%	Total % of Daily	PC%	HV%	2A%	3A%	2007 Daily Volume	PC	HV	2A	3A	PC	HV	2A	3A	LOS	Posted Speed
I-81 Exit 077 NB Off-ramp @ Rts 11, 52 and 336	4.63%	60.29%	39.71%	3.88%	35.83%	6.22%	68.25%	31.75%	3.97%	27.78%	4,500	126	83	8	75	191	89	11	78	B	30
I-81 Exit 077 NB On-ramp @ Rts 11/52/336	5.33%	38.33%	61.67%	3.30%	58.37%	5.68%	48.44%	51.56%	4.12%	47.44%	3,400	69	112	6	106	94	100	8	92	B	30
I-81 Exit 077 SB Off-ramp @ Rts 11/52/336	4.89%	41.77%	58.23%	6.09%	52.13%	9.52%	39.94%	60.06%	3.44%	56.63%	3,400	69	97	10	87	129	194	11	183	B	30
I-81 Exit 077 SB On-ramp @ Rts 11/52/336	6.39%	64.02%	35.98%	2.25%	33.73%	6.74%	57.08%	42.92%	2.13%	40.79%	3,600	147	83	5	78	139	104	5	99	B	30

2007 Existing Interchange 80 Data

	AM Percentages					PM Percentages						2007 AM Volumes				2007 PM Volumes				2007 Design Hour	
Loc_Name	Total % of Daily	PC%	HV%	2A%	3A%	Total % of Daily	PC%	HV%	2A%	3A%	2007 Daily Volume	PC	HV	2A	3A	PC	HV	2A	3A	LOS	Posted Speed
I-81 Exit 080 NB Off-ramp @ Rt 52/121	4.35%	64.83%	35.17%	4.09%	31.08%	7.83%	82.38%	17.62%	0.76%	16.87%	3,400	96	52	6	46	219	47	2	45	B	30
I-81 Exit 080 NB On-ramp @ Rts 52/121	6.83%	70.91%	29.09%	4.50%	24.59%	5.75%	64.86%	35.14%	2.14%	33.00%	3,300	160	66	10	55	123	67	4	63	A	30
I-81 Exit 080 SB Off-ramp @ Rts. 52/121	4.28%	72.33%	27.67%	1.91%	25.77%	10.16%	80.16%	19.84%	2.41%	17.43%	3,700	114	44	3	41	301	75	9	66	B	30
I-81 Exit 080 SB On-ramp @ Rts 52/121	7.36%	79.21%	20.79%	2.42%	18.37%	7.39%	73.21%	26.79%	4.81%	21.97%	3,900	227	60	7	53	211	77	14	63	B	30

2007 Existing Interchange 81 Data

	AM Percentages					PM Percentages						2007 AM Volumes				2007 PM Volumes				2007 Design Hour	
Loc_Name	Total % of Daily	PC%	HV%	2A%	3A%	Total % of Daily	PC%	HV%	2A%	3A%	2007 Daily Volume	PC	HV	2A	3A	PC	HV	2A	3A	LOS	Posted Speed
I-81 Exit 081 NB Off-ramp to I77 SB--Westbound	5.65%	59.68%	40.32%	4.03%	36.29%	5.36%	63.27%	36.73%	3.67%	33.06%	16,200	546	369	37	332	549	319	32	287	A	50
I-81 Exit 081 NB On-ramp from I77 NB--Westbound	5.67%	58.15%	41.85%	4.19%	37.67%	6.64%	55.92%	44.08%	4.41%	39.67%	8,400	277	199	20	179	312	246	25	221	B	35
I-81 Exit 081 SB Off-ramp to I77 SB--Westbound	6.90%	57.58%	42.42%	4.24%	38.18%	6.10%	58.96%	41.04%	4.10%	36.93%	9,300	370	272	27	245	335	233	23	210	A	30
I-81 Exit 081 SB On-ramp from I77 NB--Westbound	4.86%	66.45%	33.55%	3.36%	30.20%	6.59%	57.32%	42.68%	4.27%	38.42%	18,500	598	302	30	272	699	521	52	469	A	No posting

Note: Assumed 2A HV (Class 5) comprises 10% of Total Truck Volume for Interchanges 72 and 81; no detailed classification data available.
N/A - Not Available

	Direction	From Exit	To Exit	Volume	$LOS_{v/c\ ratio}$	Speed	Scenario
Existing Conditions Northbound							
12:00:00 AM	I-81N	72	73	375	A	64.5	0
1:00:00 AM	I-81N	72	73	301	A	64.5	0
2:00:00 AM	I-81N	72	73	314	A	64.5	0
3:00:00 AM	I-81N	72	73	279	A	64.5	0
4:00:00 AM	I-81N	72	73	334	A	64.5	0
5:00:00 AM	I-81N	72	73	435	A	64.5	0
6:00:00 AM	I-81N	72	73	636	A	64.5	0
7:00:00 AM	I-81N	72	73	919	A	64.5	0
8:00:00 AM	I-81N	72	73	1058	A	64.5	0
9:00:00 AM	I-81N	72	73	1244	A	64.5	0
10:00:00 AM	I-81N	72	73	1497	B	64.5	0
11:00:00 AM	I-81N	72	73	1629	B	64.5	0
12:00:00 PM	I-81N	72	73	1647	B	64.5	0
1:00:00 PM	I-81N	72	73	1683	B	64.5	0
2:00:00 PM	I-81N	72	73	1935	B	64.5	0
3:00:00 PM	I-81N	72	73	2035	B	64.5	0
4:00:00 PM	I-81N	72	73	1981	B	64.5	0
5:00:00 PM	I-81N	72	73	1786	B	64.5	0
6:00:00 PM	I-81N	72	73	1390	B	64.5	0
7:00:00 PM	I-81N	72	73	1146	A	64.5	0
8:00:00 PM	I-81N	72	73	951	A	64.5	0
9:00:00 PM	I-81N	72	73	810	A	64.5	0
10:00:00 PM	I-81N	72	73	606	A	64.5	0
11:00:00 PM	I-81N	72	73	507	A	64.5	0
Existing Conditions Southbound							
12:00:00 AM	I-81S	73	72	334	A	67.0	0
1:00:00 AM	I-81S	73	72	257	A	67.0	0
2:00:00 AM	I-81S	73	72	199	A	67.0	0
3:00:00 AM	I-81S	73	72	204	A	67.0	0
4:00:00 AM	I-81S	73	72	252	A	67.0	0
5:00:00 AM	I-81S	73	72	372	A	67.0	0
6:00:00 AM	I-81S	73	72	639	A	67.0	0
7:00:00 AM	I-81S	73	72	1019	A	67.0	0
8:00:00 AM	I-81S	73	72	1288	A	67.0	0
9:00:00 AM	I-81S	73	72	1361	B	67.0	0
10:00:00 AM	I-81S	73	72	1528	B	67.0	0
11:00:00 AM	I-81S	73	72	1676	B	67.0	0
12:00:00 PM	I-81S	73	72	1680	B	67.0	0
1:00:00 PM	I-81S	73	72	1685	B	67.0	0
2:00:00 PM	I-81S	73	72	1751	B	67.0	0
3:00:00 PM	I-81S	73	72	1753	B	67.0	0
4:00:00 PM	I-81S	73	72	1718	B	67.0	0
5:00:00 PM	I-81S	73	72	1664	B	67.0	0
6:00:00 PM	I-81S	73	72	1428	B	67.0	0
7:00:00 PM	I-81S	73	72	1137	A	67.0	0
8:00:00 PM	I-81S	73	72	911	A	67.0	0
9:00:00 PM	I-81S	73	72	783	A	67.0	0
10:00:00 PM	I-81S	73	72	598	A	67.0	0
11:00:00 PM	I-81S	73	72	464	A	67.0	0

	Direction	From Exit	To Exit	Volume	$LOS_{v/c\ ratio}$	Speed	Scenario
	Existing Conditions						
12:00:00 AM	I-81N	73	77	412	A	67.0	0
1:00:00 AM	I-81N	73	77	331	A	67.0	0
2:00:00 AM	I-81N	73	77	345	A	67.0	0
3:00:00 AM	I-81N	73	77	306	A	67.0	0
4:00:00 AM	I-81N	73	77	367	A	67.0	0
5:00:00 AM	I-81N	73	77	477	A	67.0	0
6:00:00 AM	I-81N	73	77	699	A	67.0	0
7:00:00 AM	I-81N	73	77	1010	A	67.0	0
8:00:00 AM	I-81N	73	77	1162	A	67.0	0
9:00:00 AM	I-81N	73	77	1366	A	67.0	0
10:00:00 AM	I-81N	73	77	1644	A	67.0	0
11:00:00 AM	I-81N	73	77	1789	B	67.0	0
12:00:00 PM	I-81N	73	77	1809	B	67.0	0
1:00:00 PM	I-81N	73	77	1848	B	67.0	0
2:00:00 PM	I-81N	73	77	2125	B	67.0	0
3:00:00 PM	I-81N	73	77	2235	B	67.0	0
4:00:00 PM	I-81N	73	77	2175	B	67.0	0
5:00:00 PM	I-81N	73	77	1961	B	67.0	0
6:00:00 PM	I-81N	73	77	1526	A	67.0	0
7:00:00 PM	I-81N	73	77	1259	A	67.0	0
8:00:00 PM	I-81N	73	77	1044	A	67.0	0
9:00:00 PM	I-81N	73	77	889	A	67.0	0
10:00:00 PM	I-81N	73	77	666	A	67.0	0
11:00:00 PM	I-81N	73	77	556	A	67.0	0
	Existing Conditions Southbound						
12:00:00 AM	I-81S	73	77	372	A	67.0	0
1:00:00 AM	I-81S	73	77	286	A	67.0	0
2:00:00 AM	I-81S	73	77	221	A	67.0	0
3:00:00 AM	I-81S	73	77	228	A	67.0	0
4:00:00 AM	I-81S	73	77	280	A	67.0	0
5:00:00 AM	I-81S	73	77	414	A	67.0	0
6:00:00 AM	I-81S	73	77	712	A	67.0	0
7:00:00 AM	I-81S	73	77	1134	A	67.0	0
8:00:00 AM	I-81S	73	77	1434	B	67.0	0
9:00:00 AM	I-81S	73	77	1515	B	67.0	0
10:00:00 AM	I-81S	73	77	1701	B	67.0	0
11:00:00 AM	I-81S	73	77	1866	B	67.0	0
12:00:00 PM	I-81S	73	77	1871	B	67.0	0
1:00:00 PM	I-81S	73	77	1876	B	67.0	0
2:00:00 PM	I-81S	73	77	1949	B	67.0	0
3:00:00 PM	I-81S	73	77	1951	B	67.0	0
4:00:00 PM	I-81S	73	77	1913	B	67.0	0
5:00:00 PM	I-81S	73	77	1853	B	67.0	0
6:00:00 PM	I-81S	73	77	1589	B	67.0	0
7:00:00 PM	I-81S	73	77	1265	A	67.0	0
8:00:00 PM	I-81S	73	77	1015	A	67.0	0
9:00:00 PM	I-81S	73	77	872	A	67.0	0
10:00:00 PM	I-81S	73	77	666	A	67.0	0
11:00:00 PM	I-81S	73	77	516	A	67.0	0

	Direction	From Exit	To Exit	Volume	$LOS_{v/c\ ratio}$	Speed	Scenario
	Existing Conditions						
12:00:00 AM	I-81N	77	80	396	A	67.0	0
1:00:00 AM	I-81N	77	80	318	A	67.0	0
2:00:00 AM	I-81N	77	80	332	A	67.0	0
3:00:00 AM	I-81N	77	80	294	A	67.0	0
4:00:00 AM	I-81N	77	80	353	A	67.0	0
5:00:00 AM	I-81N	77	80	459	A	67.0	0
6:00:00 AM	I-81N	77	80	671	A	67.0	0
7:00:00 AM	I-81N	77	80	970	A	67.0	0
8:00:00 AM	I-81N	77	80	1116	A	67.0	0
9:00:00 AM	I-81N	77	80	1312	A	67.0	0
10:00:00 AM	I-81N	77	80	1579	A	67.0	0
11:00:00 AM	I-81N	77	80	1718	A	67.0	0
12:00:00 PM	I-81N	77	80	1738	A	67.0	0
1:00:00 PM	I-81N	77	80	1775	A	67.0	0
2:00:00 PM	I-81N	77	80	2042	B	67.0	0
3:00:00 PM	I-81N	77	80	2147	B	67.0	0
4:00:00 PM	I-81N	77	80	2090	B	67.0	0
5:00:00 PM	I-81N	77	80	1884	B	67.0	0
6:00:00 PM	I-81N	77	80	1466	A	67.0	0
7:00:00 PM	I-81N	77	80	1209	A	67.0	0
8:00:00 PM	I-81N	77	80	1003	A	67.0	0
9:00:00 PM	I-81N	77	80	854	A	67.0	0
10:00:00 PM	I-81N	77	80	640	A	67.0	0
11:00:00 PM	I-81N	77	80	535	A	67.0	0
	Existing Conditions Southbound						
12:00:00 AM	I-81S	80	77	369	A	67.0	0
1:00:00 AM	I-81S	80	77	284	A	67.0	0
2:00:00 AM	I-81S	80	77	220	A	67.0	0
3:00:00 AM	I-81S	80	77	226	A	67.0	0
4:00:00 AM	I-81S	80	77	278	A	67.0	0
5:00:00 AM	I-81S	80	77	411	A	67.0	0
6:00:00 AM	I-81S	80	77	707	A	67.0	0
7:00:00 AM	I-81S	80	77	1126	A	67.0	0
8:00:00 AM	I-81S	80	77	1424	A	67.0	0
9:00:00 AM	I-81S	80	77	1504	A	67.0	0
10:00:00 AM	I-81S	80	77	1688	B	67.0	0
11:00:00 AM	I-81S	80	77	1853	B	67.0	0
12:00:00 PM	I-81S	80	77	1857	B	67.0	0
1:00:00 PM	I-81S	80	77	1863	B	67.0	0
2:00:00 PM	I-81S	80	77	1935	B	67.0	0
3:00:00 PM	I-81S	80	77	1937	B	67.0	0
4:00:00 PM	I-81S	80	77	1899	B	67.0	0
5:00:00 PM	I-81S	80	77	1840	B	67.0	0
6:00:00 PM	I-81S	80	77	1578	B	67.0	0
7:00:00 PM	I-81S	80	77	1256	A	67.0	0
8:00:00 PM	I-81S	80	77	1007	A	67.0	0
9:00:00 PM	I-81S	80	77	865	A	67.0	0
10:00:00 PM	I-81S	80	77	661	A	67.0	0
11:00:00 PM	I-81S	80	77	512	A	67.0	0

	Direction	From Exit	To Exit	Volume	$LOS_{v/c\ ratio}$	Speed	Scenario
	Existing Conditions						
12:00:00 AM	I-81N	80	81	394	A	64.5	0
1:00:00 AM	I-81N	80	81	317	A	64.5	0
2:00:00 AM	I-81N	80	81	331	A	64.5	0
3:00:00 AM	I-81N	80	81	293	A	64.5	0
4:00:00 AM	I-81N	80	81	351	A	64.5	0
5:00:00 AM	I-81N	80	81	457	A	64.5	0
6:00:00 AM	I-81N	80	81	669	A	64.5	0
7:00:00 AM	I-81N	80	81	966	A	64.5	0
8:00:00 AM	I-81N	80	81	1112	A	64.5	0
9:00:00 AM	I-81N	80	81	1307	A	64.5	0
10:00:00 AM	I-81N	80	81	1573	A	64.5	0
11:00:00 AM	I-81N	80	81	1712	A	64.5	0
12:00:00 PM	I-81N	80	81	1731	A	64.5	0
1:00:00 PM	I-81N	80	81	1769	B	64.5	0
2:00:00 PM	I-81N	80	81	2034	B	64.5	0
3:00:00 PM	I-81N	80	81	2139	B	64.5	0
4:00:00 PM	I-81N	80	81	2082	B	64.5	0
5:00:00 PM	I-81N	80	81	1877	B	64.5	0
6:00:00 PM	I-81N	80	81	1461	A	64.5	0
7:00:00 PM	I-81N	80	81	1205	A	64.5	0
8:00:00 PM	I-81N	80	81	999	A	64.5	0
9:00:00 PM	I-81N	80	81	851	A	64.5	0
10:00:00 PM	I-81N	80	81	637	A	64.5	0
11:00:00 PM	I-81N	80	81	533	A	64.5	0
	Existing Conditions Southbound						
12:00:00 AM	I-81S	81	80	366	A	64.5	0
1:00:00 AM	I-81S	81	80	282	A	64.5	0
2:00:00 AM	I-81S	81	80	218	A	64.5	0
3:00:00 AM	I-81S	81	80	224	A	64.5	0
4:00:00 AM	I-81S	81	80	276	A	64.5	0
5:00:00 AM	I-81S	81	80	408	A	64.5	0
6:00:00 AM	I-81S	81	80	701	A	64.5	0
7:00:00 AM	I-81S	81	80	1118	A	64.5	0
8:00:00 AM	I-81S	81	80	1413	A	64.5	0
9:00:00 AM	I-81S	81	80	1493	A	64.5	0
10:00:00 AM	I-81S	81	80	1676	A	64.5	0
11:00:00 AM	I-81S	81	80	1839	B	64.5	0
12:00:00 PM	I-81S	81	80	1844	B	64.5	0
1:00:00 PM	I-81S	81	80	1849	B	64.5	0
2:00:00 PM	I-81S	81	80	1921	B	64.5	0
3:00:00 PM	I-81S	81	80	1923	B	64.5	0
4:00:00 PM	I-81S	81	80	1885	B	64.5	0
5:00:00 PM	I-81S	81	80	1826	B	64.5	0
6:00:00 PM	I-81S	81	80	1566	A	64.5	0
7:00:00 PM	I-81S	81	80	1247	A	64.5	0
8:00:00 PM	I-81S	81	80	1000	A	64.5	0
9:00:00 PM	I-81S	81	80	859	A	64.5	0
10:00:00 PM	I-81S	81	80	656	A	64.5	0
11:00:00 PM	I-81S	81	80	509	A	64.5	0

	Direction	From Exit	To Exit	Volume	$LOS_{v/c\ ratio}$	Speed	Scenario
Existing Conditions							
12:00:00 AM	I-81N	81	North	394	A	64.5	0
1:00:00 AM	I-81N	81	North	317	A	64.5	0
2:00:00 AM	I-81N	81	North	331	A	64.5	0
3:00:00 AM	I-81N	81	North	293	A	64.5	0
4:00:00 AM	I-81N	81	North	351	A	64.5	0
5:00:00 AM	I-81N	81	North	457	A	64.5	0
6:00:00 AM	I-81N	81	North	669	A	64.5	0
7:00:00 AM	I-81N	81	North	966	A	64.5	0
8:00:00 AM	I-81N	81	North	1112	A	64.5	0
9:00:00 AM	I-81N	81	North	1307	A	64.5	0
10:00:00 AM	I-81N	81	North	1573	A	64.5	0
11:00:00 AM	I-81N	81	North	1712	A	64.5	0
12:00:00 PM	I-81N	81	North	1731	A	64.5	0
1:00:00 PM	I-81N	81	North	1769	B	64.5	0
2:00:00 PM	I-81N	81	North	2034	B	64.5	0
3:00:00 PM	I-81N	81	North	2139	B	64.5	0
4:00:00 PM	I-81N	81	North	2082	B	64.5	0
5:00:00 PM	I-81N	81	North	1877	B	64.5	0
6:00:00 PM	I-81N	81	North	1461	A	64.5	0
7:00:00 PM	I-81N	81	North	1205	A	64.5	0
8:00:00 PM	I-81N	81	North	999	A	64.5	0
9:00:00 PM	I-81N	81	North	851	A	64.5	0
10:00:00 PM	I-81N	81	North	637	A	64.5	0
11:00:00 PM	I-81N	81	North	533	A	64.5	0
Existing Conditions Southbound							
12:00:00 AM	I-81S	North	81	366	A	64.5	0
1:00:00 AM	I-81S	North	81	282	A	64.5	0
2:00:00 AM	I-81S	North	81	218	A	64.5	0
3:00:00 AM	I-81S	North	81	224	A	64.5	0
4:00:00 AM	I-81S	North	81	276	A	64.5	0
5:00:00 AM	I-81S	North	81	408	A	64.5	0
6:00:00 AM	I-81S	North	81	701	A	64.5	0
7:00:00 AM	I-81S	North	81	1118	A	64.5	0
8:00:00 AM	I-81S	North	81	1413	A	64.5	0
9:00:00 AM	I-81S	North	81	1493	A	64.5	0
10:00:00 AM	I-81S	North	81	1676	A	64.5	0
11:00:00 AM	I-81S	North	81	1839	B	64.5	0
12:00:00 PM	I-81S	North	81	1844	B	64.5	0
1:00:00 PM	I-81S	North	81	1849	B	64.5	0
2:00:00 PM	I-81S	North	81	1921	B	64.5	0
3:00:00 PM	I-81S	North	81	1923	B	64.5	0
4:00:00 PM	I-81S	North	81	1885	B	64.5	0
5:00:00 PM	I-81S	North	81	1826	B	64.5	0
6:00:00 PM	I-81S	North	81	1566	A	64.5	0
7:00:00 PM	I-81S	North	81	1247	A	64.5	0
8:00:00 PM	I-81S	North	81	1000	A	64.5	0
9:00:00 PM	I-81S	North	81	859	A	64.5	0
10:00:00 PM	I-81S	North	81	656	A	64.5	0
11:00:00 PM	I-81S	North	81	509	A	64.5	0

	Direction	From Exit	To Exit	Volume	$LOS_{v/c\ ratio}$	Speed	Scenario
	2035 Proposed Alternative New Alignment						
12:00:00 AM	New NB	72	81	279	A	65.5	0
1:00:00 AM	New NB	72	81	224	A	65.5	0
2:00:00 AM	New NB	72	81	234	A	65.5	0
3:00:00 AM	New NB	72	81	208	A	65.5	0
4:00:00 AM	New NB	72	81	249	A	65.5	0
5:00:00 AM	New NB	72	81	324	A	65.5	0
6:00:00 AM	New NB	72	81	474	A	65.5	0
7:00:00 AM	New NB	72	81	685	A	65.5	0
8:00:00 AM	New NB	72	81	789	A	65.5	0
9:00:00 AM	New NB	72	81	927	B	65.5	0
10:00:00 AM	New NB	72	81	1115	B	65.5	0
11:00:00 AM	New NB	72	81	1214	B	65.5	0
12:00:00 PM	New NB	72	81	1227	B	65.5	0
1:00:00 PM	New NB	72	81	1254	B	65.5	0
2:00:00 PM	New NB	72	81	1442	C	65.5	0
3:00:00 PM	New NB	72	81	1517	C	65.5	0
4:00:00 PM	New NB	72	81	1476	C	65.5	0
5:00:00 PM	New NB	72	81	1331	B	65.5	0
6:00:00 PM	New NB	72	81	1035	B	65.5	0
7:00:00 PM	New NB	72	81	854	A	65.5	0
8:00:00 PM	New NB	72	81	708	A	65.5	0
9:00:00 PM	New NB	72	81	603	A	65.5	0
10:00:00 PM	New NB	72	81	452	A	65.5	0
11:00:00 PM	New NB	72	81	378	A	65.5	0
	2035 Proposed Alternative New Alignment						
12:00:00 AM	New SB	81	72	284	A	65.5	0
1:00:00 AM	New SB	81	72	219	A	65.5	0
2:00:00 AM	New SB	81	72	169	A	65.5	0
3:00:00 AM	New SB	81	72	174	A	65.5	0
4:00:00 AM	New SB	81	72	214	A	65.5	0
5:00:00 AM	New SB	81	72	316	A	65.5	0
6:00:00 AM	New SB	81	72	543	A	65.5	0
7:00:00 AM	New SB	81	72	866	B	65.5	0
8:00:00 AM	New SB	81	72	1095	B	65.5	0
9:00:00 AM	New SB	81	72	1157	B	65.5	0
10:00:00 AM	New SB	81	72	1299	B	65.5	0
11:00:00 AM	New SB	81	72	1425	C	65.5	0
12:00:00 PM	New SB	81	72	1429	C	65.5	0
1:00:00 PM	New SB	81	72	1433	C	65.5	0
2:00:00 PM	New SB	81	72	1488	C	65.5	0
3:00:00 PM	New SB	81	72	1490	C	65.5	0
4:00:00 PM	New SB	81	72	1461	C	65.5	0
5:00:00 PM	New SB	81	72	1415	C	65.5	0
6:00:00 PM	New SB	81	72	1214	B	65.5	0
7:00:00 PM	New SB	81	72	966	B	65.5	0
8:00:00 PM	New SB	81	72	775	A	65.5	0
9:00:00 PM	New SB	81	72	666	A	65.5	0
10:00:00 PM	New SB	81	72	508	A	65.5	0
11:00:00 PM	New SB	81	72	394	A	65.5	0

	Direction	From Exit	To Exit	Volume	$LOS_{v/c\ ratio}$	Speed	Scenario
	2035 Proposed Alternative New Alignment						
12:00:00 AM	New NB	72	81	90	A	65.5	0
1:00:00 AM	New NB	72	81	81	A	65.5	0
2:00:00 AM	New NB	72	81	97	A	65.5	0
3:00:00 AM	New NB	72	81	86	A	65.5	0
4:00:00 AM	New NB	72	81	89	A	65.5	0
5:00:00 AM	New NB	72	81	86	A	65.5	0
6:00:00 AM	New NB	72	81	86	A	65.5	0
7:00:00 AM	New NB	72	81	100	A	65.5	0
8:00:00 AM	New NB	72	81	132	A	65.5	0
9:00:00 AM	New NB	72	81	149	A	65.5	0
10:00:00 AM	New NB	72	81	172	A	65.5	0
11:00:00 AM	New NB	72	81	186	A	65.5	0
12:00:00 PM	New NB	72	81	177	A	65.5	0
1:00:00 PM	New NB	72	81	176	A	65.5	0
2:00:00 PM	New NB	72	81	176	A	65.5	0
3:00:00 PM	New NB	72	81	181	A	65.5	0
4:00:00 PM	New NB	72	81	193	A	65.5	0
5:00:00 PM	New NB	72	81	186	A	65.5	0
6:00:00 PM	New NB	72	81	187	A	65.5	0
7:00:00 PM	New NB	72	81	185	A	65.5	0
8:00:00 PM	New NB	72	81	169	A	65.5	0
9:00:00 PM	New NB	72	81	165	A	65.5	0
10:00:00 PM	New NB	72	81	149	A	65.5	0
11:00:00 PM	New NB	72	81	139	A	65.5	0
	2035 Proposed Alternative New Alignment						
12:00:00 AM	New SB	81	72	110	A	65.5	0
1:00:00 AM	New SB	81	72	89	A	65.5	0
2:00:00 AM	New SB	81	72	77	A	65.5	0
3:00:00 AM	New SB	81	72	81	A	65.5	0
4:00:00 AM	New SB	81	72	91	A	65.5	0
5:00:00 AM	New SB	81	72	98	A	65.5	0
6:00:00 AM	New SB	81	72	134	A	65.5	0
7:00:00 AM	New SB	81	72	156	A	65.5	0
8:00:00 AM	New SB	81	72	192	A	65.5	0
9:00:00 AM	New SB	81	72	213	A	65.5	0
10:00:00 AM	New SB	81	72	239	A	65.5	0
11:00:00 AM	New SB	81	72	257	A	65.5	0
12:00:00 PM	New SB	81	72	270	A	65.5	0
1:00:00 PM	New SB	81	72	291	A	65.5	0
2:00:00 PM	New SB	81	72	302	A	65.5	0
3:00:00 PM	New SB	81	72	310	A	65.5	0
4:00:00 PM	New SB	81	72	322	A	65.5	0
5:00:00 PM	New SB	81	72	336	A	65.5	0
6:00:00 PM	New SB	81	72	319	A	65.5	0
7:00:00 PM	New SB	81	72	299	A	65.5	0
8:00:00 PM	New SB	81	72	266	A	65.5	0
9:00:00 PM	New SB	81	72	256	A	65.5	0
10:00:00 PM	New SB	81	72	215	A	65.5	0
11:00:00 PM	New SB	81	72	188	A	65.5	0

	Direction	From Exit	To Exit	Volume	$LOS_{v/c\ ratio}$	Speed	Scenario
	2035 Widening Conditions Northbound						
12:00:00 AM	I-81N	72	73	701	A	66.0	0
1:00:00 AM	I-81N	72	73	563	A	66.0	0
2:00:00 AM	I-81N	72	73	588	A	66.0	0
3:00:00 AM	I-81N	72	73	522	A	66.0	0
4:00:00 AM	I-81N	72	73	625	A	66.0	0
5:00:00 AM	I-81N	72	73	813	A	66.0	0
6:00:00 AM	I-81N	72	73	1190	A	66.0	0
7:00:00 AM	I-81N	72	73	1720	A	66.0	0
8:00:00 AM	I-81N	72	73	1980	B	66.0	0
9:00:00 AM	I-81N	72	73	2326	B	66.0	0
10:00:00 AM	I-81N	72	73	2800	B	66.0	0
11:00:00 AM	I-81N	72	73	3047	C	66.0	0
12:00:00 PM	I-81N	72	73	3081	C	66.0	0
1:00:00 PM	I-81N	72	73	3148	C	66.0	0
2:00:00 PM	I-81N	72	73	3620	C	66.0	0
3:00:00 PM	I-81N	72	73	3808	C	65.9	0
4:00:00 PM	I-81N	72	73	3706	C	65.9	0
5:00:00 PM	I-81N	72	73	3341	C	66.0	0
6:00:00 PM	I-81N	72	73	2600	B	66.0	0
7:00:00 PM	I-81N	72	73	2144	B	66.0	0
8:00:00 PM	I-81N	72	73	1778	B	66.0	0
9:00:00 PM	I-81N	72	73	1515	A	66.0	0
10:00:00 PM	I-81N	72	73	1134	A	66.0	0
11:00:00 PM	I-81N	72	73	948	A	66.0	0
	2035 Widening Conditions Southbound						
12:00:00 AM	I-81S	73	72	619	A	66.0	0
1:00:00 AM	I-81S	73	72	477	A	66.0	0
2:00:00 AM	I-81S	73	72	369	A	66.0	0
3:00:00 AM	I-81S	73	72	379	A	66.0	0
4:00:00 AM	I-81S	73	72	466	A	66.0	0
5:00:00 AM	I-81S	73	72	690	A	66.0	0
6:00:00 AM	I-81S	73	72	1185	A	66.0	0
7:00:00 AM	I-81S	73	72	1889	A	66.0	0
8:00:00 AM	I-81S	73	72	2388	B	66.0	0
9:00:00 AM	I-81S	73	72	2523	B	66.0	0
10:00:00 AM	I-81S	73	72	2833	B	66.0	0
11:00:00 AM	I-81S	73	72	3108	B	66.0	0
12:00:00 PM	I-81S	73	72	3116	B	66.0	0
1:00:00 PM	I-81S	73	72	3125	B	66.0	0
2:00:00 PM	I-81S	73	72	3246	B	66.0	0
3:00:00 PM	I-81S	73	72	3250	B	66.0	0
4:00:00 PM	I-81S	73	72	3186	B	66.0	0
5:00:00 PM	I-81S	73	72	3086	B	66.0	0
6:00:00 PM	I-81S	73	72	2647	B	66.0	0
7:00:00 PM	I-81S	73	72	2108	A	66.0	0
8:00:00 PM	I-81S	73	72	1690	A	66.0	0
9:00:00 PM	I-81S	73	72	1451	A	66.0	0
10:00:00 PM	I-81S	73	72	1109	A	66.0	0
11:00:00 PM	I-81S	73	72	860	A	66.0	0

	Direction	From Exit	To Exit	Volume	$LOS_{v/c\ ratio}$	Speed	Scenario
	2035 Widening Conditions Northbound						
12:00:00 AM	I-81N	73	77	768	A	68.5	0
1:00:00 AM	I-81N	73	77	617	A	68.5	0
2:00:00 AM	I-81N	73	77	644	A	68.5	0
3:00:00 AM	I-81N	73	77	571	A	68.5	0
4:00:00 AM	I-81N	73	77	684	A	68.5	0
5:00:00 AM	I-81N	73	77	890	A	68.5	0
6:00:00 AM	I-81N	73	77	1303	A	68.5	0
7:00:00 AM	I-81N	73	77	1882	A	68.5	0
8:00:00 AM	I-81N	73	77	2167	A	68.5	0
9:00:00 AM	I-81N	73	77	2546	B	68.5	0
10:00:00 AM	I-81N	73	77	3064	B	68.5	0
11:00:00 AM	I-81N	73	77	3334	B	68.5	0
12:00:00 PM	I-81N	73	77	3372	B	68.5	0
1:00:00 PM	I-81N	73	77	3445	B	68.5	0
2:00:00 PM	I-81N	73	77	3962	C	68.5	0
3:00:00 PM	I-81N	73	77	4167	C	68.5	0
4:00:00 PM	I-81N	73	77	4056	C	68.5	0
5:00:00 PM	I-81N	73	77	3656	C	68.5	0
6:00:00 PM	I-81N	73	77	2845	B	68.5	0
7:00:00 PM	I-81N	73	77	2346	B	68.5	0
8:00:00 PM	I-81N	73	77	1946	A	68.5	0
9:00:00 PM	I-81N	73	77	1658	A	68.5	0
10:00:00 PM	I-81N	73	77	1241	A	68.5	0
11:00:00 PM	I-81N	73	77	1037	A	68.5	0
	2035 Widening Conditions Southbound						
12:00:00 AM	I-81S	77	73	687	A	68.5	0
1:00:00 AM	I-81S	77	73	529	A	68.5	0
2:00:00 AM	I-81S	77	73	409	A	68.5	0
3:00:00 AM	I-81S	77	73	421	A	68.5	0
4:00:00 AM	I-81S	77	73	517	A	68.5	0
5:00:00 AM	I-81S	77	73	765	A	68.5	0
6:00:00 AM	I-81S	77	73	1315	A	68.5	0
7:00:00 AM	I-81S	77	73	2096	B	68.5	0
8:00:00 AM	I-81S	77	73	2649	B	68.5	0
9:00:00 AM	I-81S	77	73	2799	B	68.5	0
10:00:00 AM	I-81S	77	73	3142	C	68.5	0
11:00:00 AM	I-81S	77	73	3447	C	68.5	0
12:00:00 PM	I-81S	77	73	3456	C	68.5	0
1:00:00 PM	I-81S	77	73	3466	C	68.5	0
2:00:00 PM	I-81S	77	73	3601	C	68.4	0
3:00:00 PM	I-81S	77	73	3605	C	68.4	0
4:00:00 PM	I-81S	77	73	3533	C	68.5	0
5:00:00 PM	I-81S	77	73	3423	C	68.5	0
6:00:00 PM	I-81S	77	73	2936	B	68.5	0
7:00:00 PM	I-81S	77	73	2338	B	68.5	0
8:00:00 PM	I-81S	77	73	1875	B	68.5	0
9:00:00 PM	I-81S	77	73	1610	A	68.5	0
10:00:00 PM	I-81S	77	73	1230	A	68.5	0
11:00:00 PM	I-81S	77	73	954	A	68.5	0

	Direction	From Exit	To Exit	Volume	$LOS_{v/c\ ratio}$	Speed	Scenario
	2035 Widening Conditions Northbound						
12:00:00 AM	I-81N	77	80	738	A	68.5	0
1:00:00 AM	I-81N	77	80	593	A	68.5	0
2:00:00 AM	I-81N	77	80	619	A	68.5	0
3:00:00 AM	I-81N	77	80	549	A	68.5	0
4:00:00 AM	I-81N	77	80	658	A	68.5	0
5:00:00 AM	I-81N	77	80	856	A	68.5	0
6:00:00 AM	I-81N	77	80	1253	A	68.5	0
7:00:00 AM	I-81N	77	80	1810	A	68.5	0
8:00:00 AM	I-81N	77	80	2084	A	68.5	0
9:00:00 AM	I-81N	77	80	2448	B	68.5	0
10:00:00 AM	I-81N	77	80	2947	B	68.5	0
11:00:00 AM	I-81N	77	80	3207	B	68.5	0
12:00:00 PM	I-81N	77	80	3243	B	68.5	0
1:00:00 PM	I-81N	77	80	3313	B	68.5	0
2:00:00 PM	I-81N	77	80	3810	B	68.5	0
3:00:00 PM	I-81N	77	80	4007	C	68.5	0
4:00:00 PM	I-81N	77	80	3900	B	68.5	0
5:00:00 PM	I-81N	77	80	3516	B	68.5	0
6:00:00 PM	I-81N	77	80	2736	B	68.5	0
7:00:00 PM	I-81N	77	80	2257	A	68.5	0
8:00:00 PM	I-81N	77	80	1871	A	68.5	0
9:00:00 PM	I-81N	77	80	1594	A	68.5	0
10:00:00 PM	I-81N	77	80	1194	A	68.5	0
11:00:00 PM	I-81N	77	80	997	A	68.5	0
	2035 Widening Conditions Southbound						
12:00:00 AM	I-81S	80	77	681	A	68.5	0
1:00:00 AM	I-81S	80	77	525	A	68.5	0
2:00:00 AM	I-81S	80	77	406	A	68.5	0
3:00:00 AM	I-81S	80	77	417	A	68.5	0
4:00:00 AM	I-81S	80	77	513	A	68.5	0
5:00:00 AM	I-81S	80	77	759	A	68.5	0
6:00:00 AM	I-81S	80	77	1304	A	68.5	0
7:00:00 AM	I-81S	80	77	2079	A	68.5	0
8:00:00 AM	I-81S	80	77	2628	B	68.5	0
9:00:00 AM	I-81S	80	77	2777	B	68.5	0
10:00:00 AM	I-81S	80	77	3117	B	68.5	0
11:00:00 AM	I-81S	80	77	3420	B	68.5	0
12:00:00 PM	I-81S	80	77	3429	C	68.5	0
1:00:00 PM	I-81S	80	77	3439	C	68.5	0
2:00:00 PM	I-81S	80	77	3572	C	68.5	0
3:00:00 PM	I-81S	80	77	3576	C	68.5	0
4:00:00 PM	I-81S	80	77	3505	C	68.5	0
5:00:00 PM	I-81S	80	77	3396	B	68.5	0
6:00:00 PM	I-81S	80	77	2913	B	68.5	0
7:00:00 PM	I-81S	80	77	2319	B	68.5	0
8:00:00 PM	I-81S	80	77	1860	A	68.5	0
9:00:00 PM	I-81S	80	77	1597	A	68.5	0
10:00:00 PM	I-81S	80	77	1220	A	68.5	0
11:00:00 PM	I-81S	80	77	946	A	68.5	0

	Direction	From Exit	To Exit	Volume	$LOS_{v/c\ ratio}$	Speed	Scenario
	2035 Widening Conditions Northbound						
12:00:00 AM	I-81N	80	81	735	A	66.0	0
1:00:00 AM	I-81N	80	81	591	A	66.0	0
2:00:00 AM	I-81N	80	81	617	A	66.0	0
3:00:00 AM	I-81N	80	81	547	A	66.0	0
4:00:00 AM	I-81N	80	81	656	A	66.0	0
5:00:00 AM	I-81N	80	81	853	A	66.0	0
6:00:00 AM	I-81N	80	81	1248	A	66.0	0
7:00:00 AM	I-81N	80	81	1803	A	66.0	0
8:00:00 AM	I-81N	80	81	2075	A	66.0	0
9:00:00 AM	I-81N	80	81	2439	B	66.0	0
10:00:00 AM	I-81N	80	81	2935	B	66.0	0
11:00:00 AM	I-81N	80	81	3194	B	66.0	0
12:00:00 PM	I-81N	80	81	3230	B	66.0	0
1:00:00 PM	I-81N	80	81	3300	B	66.0	0
2:00:00 PM	I-81N	80	81	3795	B	66.0	0
3:00:00 PM	I-81N	80	81	3991	C	66.0	0
4:00:00 PM	I-81N	80	81	3885	C	66.0	0
5:00:00 PM	I-81N	80	81	3502	B	66.0	0
6:00:00 PM	I-81N	80	81	2725	B	66.0	0
7:00:00 PM	I-81N	80	81	2248	A	66.0	0
8:00:00 PM	I-81N	80	81	1864	A	66.0	0
9:00:00 PM	I-81N	80	81	1588	A	66.0	0
10:00:00 PM	I-81N	80	81	1189	A	66.0	0
11:00:00 PM	I-81N	80	81	994	A	66.0	0
	2035 Widening Conditions Southbound						
12:00:00 AM	I-81S	81	80	676	A	66.0	0
1:00:00 AM	I-81S	81	80	521	A	66.0	0
2:00:00 AM	I-81S	81	80	403	A	66.0	0
3:00:00 AM	I-81S	81	80	414	A	66.0	0
4:00:00 AM	I-81S	81	80	509	A	66.0	0
5:00:00 AM	I-81S	81	80	753	A	66.0	0
6:00:00 AM	I-81S	81	80	1294	A	66.0	0
7:00:00 AM	I-81S	81	80	2063	A	66.0	0
8:00:00 AM	I-81S	81	80	2607	B	66.0	0
9:00:00 AM	I-81S	81	80	2754	B	66.0	0
10:00:00 AM	I-81S	81	80	3092	B	66.0	0
11:00:00 AM	I-81S	81	80	3393	B	66.0	0
12:00:00 PM	I-81S	81	80	3402	B	66.0	0
1:00:00 PM	I-81S	81	80	3411	B	66.0	0
2:00:00 PM	I-81S	81	80	3544	B	66.0	0
3:00:00 PM	I-81S	81	80	3548	B	66.0	0
4:00:00 PM	I-81S	81	80	3478	B	66.0	0
5:00:00 PM	I-81S	81	80	3369	B	66.0	0
6:00:00 PM	I-81S	81	80	2890	B	66.0	0
7:00:00 PM	I-81S	81	80	2301	B	66.0	0
8:00:00 PM	I-81S	81	80	1845	A	66.0	0
9:00:00 PM	I-81S	81	80	1585	A	66.0	0
10:00:00 PM	I-81S	81	80	1210	A	66.0	0
11:00:00 PM	I-81S	81	80	939	A	66.0	0

	Direction	From Exit	To Exit	Volume	$LOS_{v/c\ ratio}$	Speed	Scenario
	2035 Widening Conditions Northbound						
12:00:00 AM	I-81N	80	81	735	A	66.0	0
1:00:00 AM	I-81N	80	81	591	A	66.0	0
2:00:00 AM	I-81N	80	81	617	A	66.0	0
3:00:00 AM	I-81N	80	81	547	A	66.0	0
4:00:00 AM	I-81N	80	81	656	A	66.0	0
5:00:00 AM	I-81N	80	81	853	A	66.0	0
6:00:00 AM	I-81N	80	81	1248	A	66.0	0
7:00:00 AM	I-81N	80	81	1803	A	66.0	0
8:00:00 AM	I-81N	80	81	2075	A	66.0	0
9:00:00 AM	I-81N	80	81	2439	B	66.0	0
10:00:00 AM	I-81N	80	81	2935	B	66.0	0
11:00:00 AM	I-81N	80	81	3194	B	66.0	0
12:00:00 PM	I-81N	80	81	3230	B	66.0	0
1:00:00 PM	I-81N	80	81	3300	B	66.0	0
2:00:00 PM	I-81N	80	81	3795	B	66.0	0
3:00:00 PM	I-81N	80	81	3991	C	66.0	0
4:00:00 PM	I-81N	80	81	3885	C	66.0	0
5:00:00 PM	I-81N	80	81	3502	B	66.0	0
6:00:00 PM	I-81N	80	81	2725	B	66.0	0
7:00:00 PM	I-81N	80	81	2248	A	66.0	0
8:00:00 PM	I-81N	80	81	1864	A	66.0	0
9:00:00 PM	I-81N	80	81	1588	A	66.0	0
10:00:00 PM	I-81N	80	81	1189	A	66.0	0
11:00:00 PM	I-81N	80	81	994	A	66.0	0
	2035 Widening Conditions Southbound						
12:00:00 AM	I-81S	81	80	676	A	66.0	0
1:00:00 AM	I-81S	81	80	521	A	66.0	0
2:00:00 AM	I-81S	81	80	403	A	66.0	0
3:00:00 AM	I-81S	81	80	414	A	66.0	0
4:00:00 AM	I-81S	81	80	509	A	66.0	0
5:00:00 AM	I-81S	81	80	753	A	66.0	0
6:00:00 AM	I-81S	81	80	1294	A	66.0	0
7:00:00 AM	I-81S	81	80	2063	A	66.0	0
8:00:00 AM	I-81S	81	80	2607	B	66.0	0
9:00:00 AM	I-81S	81	80	2754	B	66.0	0
10:00:00 AM	I-81S	81	80	3092	B	66.0	0
11:00:00 AM	I-81S	81	80	3393	B	66.0	0
12:00:00 PM	I-81S	81	80	3402	B	66.0	0
1:00:00 PM	I-81S	81	80	3411	B	66.0	0
2:00:00 PM	I-81S	81	80	3544	B	66.0	0
3:00:00 PM	I-81S	81	80	3548	B	66.0	0
4:00:00 PM	I-81S	81	80	3478	B	66.0	0
5:00:00 PM	I-81S	81	80	3369	B	66.0	0
6:00:00 PM	I-81S	81	80	2890	B	66.0	0
7:00:00 PM	I-81S	81	80	2301	B	66.0	0
8:00:00 PM	I-81S	81	80	1845	A	66.0	0
9:00:00 PM	I-81S	81	80	1585	A	66.0	0
10:00:00 PM	I-81S	81	80	1210	A	66.0	0
11:00:00 PM	I-81S	81	80	939	A	66.0	0

Attachment B

Sample Cal3Interface/CALINE3 File Input and Output File

Sample Cal3Interface Worst-Case Analysis Input File for CALINE3 (2035 Design Year)

```
51441                    60.108.0.0000.000280.30480000
N Leg, E Side-Corner 56.000000 104.000005.90000000
N Leg, E Side - 25 m 56.000000 166.000005.90000000
N Leg, E Side - 50 m 56.000000 248.000005.90000000
N Leg, E Side-Midblk 56.000000 684.000005.90000000
N Leg, W Side-Corner-56.000000 104.000005.90000000
N Leg, W Side - 25 m-56.000000 166.000005.90000000
N Leg, W Side - 50 m-56.000000 248.000005.90000000
N Leg, W Side-Midblk-56.000000 684.000005.90000000
S Leg, E Side-Corner 56.000000-104.000005.90000000
S Leg, E Side - 25 m 56.000000-166.000005.90000000
S Leg, E Side - 50 m 56.000000-248.000005.90000000
S Leg, E Side-Midblk 56.000000-684.000005.90000000
S Leg, W Side-Corner-56.000000-104.000005.90000000
S Leg, W Side - 25 m-56.000000-166.000005.90000000
S Leg, W Side - 50 m-56.000000-248.000005.90000000
S Leg, W Side-Midblk-56.000000-684.000005.90000000
E Leg, N Side - 25 m 118.00000 104.000005.90000000
E Leg, N Side - 50 m 200.00000 104.000005.90000000
E Leg, N Side-Midblk 636.00000 104.000005.90000000
W Leg, N Side - 25 m-118.00000 104.000005.90000000
W Leg, N Side - 50 m-200.00000 104.000005.90000000
W Leg, N Side-Midblk-636.00000 104.000005.90000000
E Leg, S Side - 25 m 118.00000-104.000005.90000000
E Leg, S Side - 50 m 200.00000-104.000005.90000000
E Leg, S Side-Midblk 636.00000-104.000005.90000000
W Leg, S Side - 25 m-118.00000-104.000005.90000000
W Leg, S Side - 50 m-200.00000-104.000005.90000000
W Leg, S Side-Midblk-636.00000-104.000005.90000000
2035 6x14 new loc                8  36
N Leg App - FreeFlowAG-18.000 0.0000-18.000 1200.0   6600.7.61 0.055.7
N Leg Dep - FreeFlowAG 18.000 0.0000 18.000 1200.0   6600.7.61 0.055.7
S Leg App - FreeFlowAG 18.000 0.0000 18.000-1200.0   6600.7.61 0.055.7
S Leg Dep - FreeFlowAG-18.000 0.0000-18.000-1200.0   6600.7.61 0.055.7
E Leg App - FreeFlowAG 0.0000 42.000 1200.0 42.000  15400.7.61 0.0104.
E Leg Dep - FreeFlowAG 0.0000-42.000 1200.0-42.000  15400.7.61 0.0104.
W Leg App - FreeFlowAG 0.0000-42.000-1200.0-42.000  15400.7.61 0.0104.
W Leg Dep - FreeFlowAG 0.0000 42.000-1200.0 42.000  15400.7.61 0.0104.
```

1.010.04	*1000.000*
1.020.04	*1000.000*
1.030.04	*1000.000*
1.040.04	*1000.000*
1.050.04	*1000.000*
1.060.04	*1000.000*
1.070.04	*1000.000*
1.080.04	*1000.000*
1.090.04	*1000.000*
1.0100.4	*1000.000*
1.0110.4	*1000.000*
1.0120.4	*1000.000*
1.0130.4	*1000.000*
1.0140.4	*1000.000*
1.0150.4	*1000.000*
1.0160.4	*1000.000*
1.0170.4	*1000.000*
1.0180.4	*1000.000*
1.0190.4	*1000.000*
1.0200.4	*1000.000*
1.0210.4	*1000.000*
1.0220.4	*1000.000*
1.0230.4	*1000.000*
1.0240.4	*1000.000*
1.0250.4	*1000.000*
1.0260.4	*1000.000*
1.0270.4	*1000.000*
1.0280.4	*1000.000*
1.0290.4	*1000.000*
1.0300.4	*1000.000*
1.0310.4	*1000.000*
1.0320.4	*1000.000*
1.0330.4	*1000.000*
1.0340.4	*1000.000*
1.0350.4	*1000.000*
1.0360.4	*1000.000*

Sample Cal3Interface Worst-Case Analysis Output File for CALINE3 (2035 Design Year)

```
1                CALINE3          (DATED 89219)
0                         CALINE3: CALIFORNIA LINE SOURCE DISPERSION MODEL -
SEPTEMBER, 1979 VERSION                  PAGE  1


    JOB: 51441                                  RUN: 2035 6x14 new loc



     I.  SITE VARIABLES


    U =  1.0 M/S            CLAS =   4  (D)        VS =   0.0 CM/S       ATIM =  60. MINUTES
MIXH =  1000. M
   BRG =  10. DEGREES        Z0 = 108. CM        VD =   0.0 CM/S       AMB =  0.0 PPM



     II.  LINK VARIABLES


     LINK DESCRIPTION      *      LINK COORDINATES (M)      * LINK LENGTH  LINK
BRG   TYPE  VPH     EF     H    W
                         *  X1      Y1      X2      Y2   *     (M)      (DEG)             (G/MI)  (M)  (M)
   -------------------------*--------------------------------*-------------------------------------------------------
-
   1. N Leg App - FreeFlow  *    -5.      0.     -5.    366. *     366.      360.      AG   6600.   7.6   0.0
17.0
   2. N Leg Dep - FreeFlow  *     5.      0.      5.    366. *     366.      360.      AG   6600.   7.6   0.0
17.0
   3. S Leg App - FreeFlow  *     5.      0.      5.   -366. *     366.      180.      AG   6600.   7.6   0.0
17.0
   4. S Leg Dep - FreeFlow  *    -5.      0.     -5.   -366. *     366.      180.      AG   6600.   7.6   0.0
17.0
   5. E Leg App - FreeFlow  *     0.     13.    366.     13. *     366.       90.      AG  15400.   7.6
0.0  31.7
   6. E Leg Dep - FreeFlow  *     0.    -13.    366.    -13. *     366.       90.      AG  15400.   7.6
0.0  31.7
```

*7. W Leg App - FreeFlow * 0. -13. -366. -13. * 366. 270. AG 15400. 7.6 0.0 31.7*
*8. W Leg Dep - FreeFlow * 0. 13. -366. 13. * 366. 270. AG 15400. 7.6 0.0 31.7*

III. RECEPTOR LOCATIONS AND MODEL RESULTS

RECEPTOR	COORDINATES (M) X	Y	Z	TOTAL CO/LINK + AMB (PPM)	1	2	3	4	5	6	7	8
1. N Leg, E Side-Corner	17.	32.	1.8	0.9	0.2	0.7	0.0	0.0	0.0	0.0	0.0	0.0
2. N Leg, E Side - 25 m	17.	51.	1.8	0.8	0.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0
3. N Leg, E Side - 50 m	17.	76.	1.8	0.8	0.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0
4. N Leg, E Side-Midblk	17.	208.	1.8	0.6	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0
5. N Leg, W Side-Corner	-17.	32.	1.8	3.3	2.2	1.1	0.0	0.0	0.0	0.0	0.0	0.0
6. N Leg, W Side - 25 m	-17.	51.	1.8	3.3	2.2	1.1	0.0	0.0	0.0	0.0	0.0	0.0
7. N Leg, W Side - 50 m	-17.	76.	1.8	3.3	2.2	1.1	0.0	0.0	0.0	0.0	0.0	0.0
8. N Leg, W Side-Midblk	-17.	208.	1.8	2.9	2.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0
9. S Leg, E Side-Corner	17.	-32.	1.8	5.1	0.2	0.5	0.1	0.0	1.6	2.7	0.0	0.0
10. S Leg, E Side - 25 m	17.	-51.	1.8	3.9	0.2	0.5	0.2	0.0	1.2	1.8	0.0	0.0
11. S Leg, E Side - 50 m	17.	-76.	1.8	3.0	0.2	0.4	0.3	0.0	0.9	1.2	0.0	0.0
12. S Leg, E Side-Midblk	17.	-208.	1.8	1.9	0.1	0.2	0.6	0.1	0.4	0.5	0.0	0.0
13. S Leg, W Side-Corner	-17.	-32.	1.8	7.8	1.4	1.1	0.1	0.9	0.3	0.0	2.7	1.3
14. S Leg, W Side - 25 m	-17.	-51.	1.8	6.5	1.0	1.0	0.2	1.3	0.4	0.3	1.5	0.8
15. S Leg, W Side - 50 m	-17.	-76.	1.8	5.7	0.7	0.8	0.4	1.6	0.5	0.4	0.8	0.5
16. S Leg, W Side-Midblk	-17.	-208.	1.8	4.6	0.2	0.3	1.0	2.1	0.3	0.4	0.2	0.1
17. E Leg, N Side - 25 m	36.	32.	1.8	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
18. E Leg, N Side - 50 m	61.	32.	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19. E Leg, N Side-Midblk	194.	32.	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20. W Leg, N Side - 25 m	-36.	32.	1.8	1.4	0.8	0.6	0.0	0.0	0.0	0.0	0.0	0.0
21. W Leg, N Side - 50 m	-61.	32.	1.8	0.7	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0
22. W Leg, N Side-Midblk	-194.	32.	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23. E Leg, S Side - 25 m	36.	-32.	1.8	4.5	0.1	0.1	0.0	0.0	1.6	2.7	0.0	0.0
24. E Leg, S Side - 50 m	61.	-32.	1.8	4.3	0.0	0.0	0.0	0.0	1.6	2.7	0.0	0.0
25. E Leg, S Side-Midblk	194.	-32.	1.8	4.3	0.0	0.0	0.0	0.0	1.6	2.7	0.0	0.0
26. W Leg, S Side - 25 m	-36.	-32.	1.8	5.8	0.9	0.7	0.0	0.0	0.0	0.0	2.7	1.5

*27. W Leg, S Side - 50 m * -61. -32. 1.8 * 5.2 * 0.5 0.4 0.0 0.0 0.0 0.0 2.7 1.6*
*28. W Leg, S Side-Midblk * -194. -32. 1.8 * 4.3 * 0.0 0.0 0.0 0.0 0.0 0.0 2.7 1.6*
0 CALINE3: CALIFORNIA LINE SOURCE DISPERSION MODEL - SEPTEMBER, 1979 VERSION PAGE 2

JOB: 51441 RUN: 2035 6x14 new loc

I. SITE VARIABLES

U = 1.0 M/S CLAS = 4 (D) VS = 0.0 CM/S ATIM = 60. MINUTES MIXH = 1000. M
BRG = 20. DEGREES Z0 = 108. CM VD = 0.0 CM/S AMB = 0.0 PPM

II. LINK VARIABLES

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

*1. N Leg App - FreeFlow * -5. 0. -5. 366. * 366. 360. AG 6600. 7.6 0.0 17.0*
*2. N Leg Dep - FreeFlow * 5. 0. 5. 366. * 366. 360. AG 6600. 7.6 0.0 17.0*
*3. S Leg App - FreeFlow * 5. 0. 5. -366. * 366. 180. AG 6600. 7.6 0.0 17.0*
*4. S Leg Dep - FreeFlow * -5. 0. -5. -366. * 366. 180. AG 6600. 7.6 0.0 17.0*
*5. E Leg App - FreeFlow * 0. 13. 366. 13. * 366. 90. AG 15400. 7.6 0.0 31.7*
*6. E Leg Dep - FreeFlow * 0. -13. 366. -13. * 366. 90. AG 15400. 7.6 0.0 31.7*
*7. W Leg App - FreeFlow * 0. -13. -366. -13. * 366. 270. AG 15400. 7.6 0.0 31.7*
*8. W Leg Dep - FreeFlow * 0. 13. -366. 13. * 366. 270. AG 15400. 7.6 0.0 31.7*

III. RECEPTOR LOCATIONS AND MODEL RESULTS

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                    *                    * TOTAL *
+                                                        CO/LINK
                    *     COORDINATES (M)      * + AMB *              (PPM)
   RECEPTOR         *     X       Y       Z    * (PPM) *  1    2    3    4    5    6    7    8
  -------------------------*-------------------------------*-------*
+                                                  ----------------------------------------
   1. N Leg, E Side-Corner *     17.     32.     1.8   *  0.2  *  0.0  0.2  0.0  0.0  0.0  0.0  0.0  0.0
   2. N Leg, E Side - 25 m *     17.     51.     1.8   *  0.2  *  0.0  0.2  0.0  0.0  0.0  0.0  0.0  0.0
   3. N Leg, E Side - 50 m *     17.     76.     1.8   *  0.2  *  0.0  0.2  0.0  0.0  0.0  0.0  0.0  0.0
   4. N Leg, E Side-Midblk *     17.    208.     1.8   *  0.1  *  0.0  0.1  0.0  0.0  0.0  0.0  0.0  0.0
   5. N Leg, W Side-Corner *    -17.     32.     1.8   *  3.3  *  2.1  1.2  0.0  0.0  0.0  0.0  0.0  0.0
   6. N Leg, W Side - 25 m *    -17.     51.     1.8   *  3.3  *  2.1  1.2  0.0  0.0  0.0  0.0  0.0  0.0
   7. N Leg, W Side - 50 m *    -17.     76.     1.8   *  3.3  *  2.1  1.2  0.0  0.0  0.0  0.0  0.0  0.0
   8. N Leg, W Side-Midblk *    -17.    208.     1.8   *  3.2  *  2.1  1.1  0.0  0.0  0.0  0.0  0.0
0.0
   9. S Leg, E Side-Corner *     17.    -32.     1.8   *  4.3  *  0.0  0.1  0.0  0.0  1.6  2.6  0.0  0.0
  10. S Leg, E Side - 25 m *     17.    -51.     1.8   *  3.2  *  0.0  0.1  0.1  0.0  1.2  1.8  0.0  0.0
  11. S Leg, E Side - 50 m *     17.    -76.     1.8   *  2.3  *  0.0  0.1  0.1  0.0  0.9  1.2  0.0  0.0
  12. S Leg, E Side-Midblk *     17.   -208.     1.8   *  1.2  *  0.0  0.0  0.2  0.0  0.5  0.5  0.0  0.0
  13. S Leg, W Side-Corner *    -17.    -32.     1.8   *  7.9  *  0.9  1.0  0.2  1.3  0.8  0.3  2.5  0.9
  14. S Leg, W Side - 25 m *    -17.    -51.     1.8   *  6.3  *  0.5  0.7  0.5  1.6  0.8  0.7  1.1  0.4
  15. S Leg, W Side - 50 m *    -17.    -76.     1.8   *  5.6  *  0.3  0.5  0.8  1.9  0.7  0.8  0.4  0.2
  16. S Leg, W Side-Midblk *    -17.   -208.     1.8   *  4.5  *  0.1  0.1  1.2  2.1  0.5  0.5  0.0
0.0
  17. E Leg, N Side - 25 m *     36.     32.     1.8   *  0.0  *  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
  18. E Leg, N Side - 50 m *     61.     32.     1.8   *  0.0  *  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
  19. E Leg, N Side-Midblk *    194.     32.     1.8   *  0.0  *  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
  20. W Leg, N Side - 25 m *    -36.     32.     1.8   *  1.8  *  1.0  0.8  0.0  0.0  0.0  0.0  0.0  0.0
  21. W Leg, N Side - 50 m *    -61.     32.     1.8   *  1.1  *  0.6  0.5  0.0  0.0  0.0  0.0  0.0  0.0
  22. W Leg, N Side-Midblk *   -194.     32.     1.8   *  0.0  *  0.0  0.0  0.0  0.0  0.0  0.0  0.0
0.0
  23. E Leg, S Side - 25 m *     36.    -32.     1.8   *  4.2  *  0.0  0.0  0.0  0.0  1.6  2.6  0.0  0.0
  24. E Leg, S Side - 50 m *     61.    -32.     1.8   *  4.2  *  0.0  0.0  0.0  0.0  1.6  2.6  0.0  0.0
  25. E Leg, S Side-Midblk *    194.    -32.     1.8   *  4.2  *  0.0  0.0  0.0  0.0  1.6  2.6  0.0  0.0
  26. W Leg, S Side - 25 m *    -36.    -32.     1.8   *  5.9  *  0.9  0.8  0.0  0.0  0.2  0.0  2.5  1.5
  27. W Leg, S Side - 50 m *    -61.    -32.     1.8   *  5.3  *  0.6  0.5  0.0  0.0  0.0  0.0  2.6  1.6
  28. W Leg, S Side-Midblk *   -194.    -32.     1.8   *  4.4  *  0.1  0.1  0.0  0.0  0.0  0.0  2.6
1.6
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