



U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
AND
VIRGINIA DEPARTMENT OF TRANSPORTATION



Air Quality Technical Report

I-95 RAPPAHANNOCK RIVER CROSSING

City of Fredericksburg

Stafford County

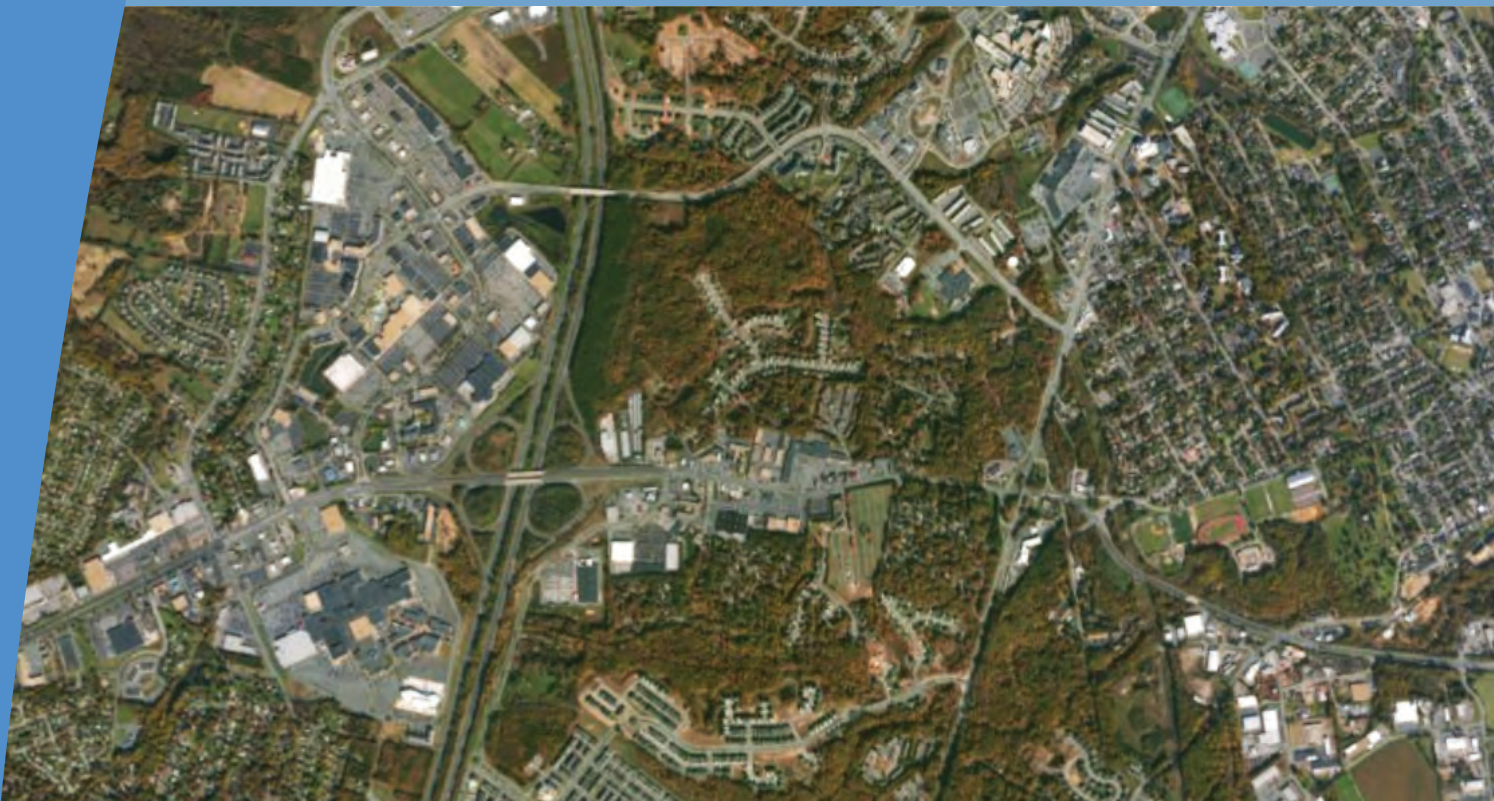
Spotsylvania County

State Project No.: 0095-111-259, P101

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Virginia Department of Transportation Rappahannock River Crossing Project

State Project Number: 0095-111-259; UPC#101595

**Interstate 95 from Route 3 Interchange to Route 17 Interchange
Stafford and Spotsylvania Counties and the City of Fredericksburg**

FINAL - AIR QUALITY TECHNICAL REPORT



Virginia Department of Transportation
Environmental Division
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I. Introduction

Air quality became a national concern in the 1960s, leading to the passage of the Clean Air Act of 1963. This was followed by the Air Quality Act of 1967, the Clean Air Act of 1970, the Clean Air Act Amendments of 1977, and the Clean Air Act Amendments of 1990. With the passage of each piece of legislation, requirements for addressing and controlling air pollution became more stringent as prior legislation failed to achieve its intended purpose. Following the passage of the Federal Clean Air Act Amendments of 1990, states were mandated to implement additional steps to reduce airborne pollutants and improve local and regional conditions. Automobile emissions have been identified as a critical element in attaining federal air quality standards for carbon monoxide (CO), particulate matter (PM), and ozone (O₃).

As a result of federal funding for this project, compliance is required with both the National Environmental Policy Act (NEPA) and the Clean Air Act. Highway agencies are required to consider the impacts of transportation improvement projects at both the local and regional level. Regional air quality, when located in non-attainment and maintenance areas, is assessed by ensuring that region-wide mobile emissions fall below the applicable motor vehicle emission budgets identified by the State Implementation Plan (SIP). Where applicable, this assessment is performed by the Virginia Department of Transportation (VDOT) and/or Metropolitan Planning Organizations (MPOs) and documented in a transportation conformity analysis on the region's Transportation Improvement Program (TIP) and Long Range Transportation Plan (LRTP). The project lies within an area designated as attainment/maintenance with the 1997 8-hour ozone National Ambient Air Quality Standard (NAAQS), and in attainment with all other NAAQS.

Generally, NEPA requires that local air quality be assessed on a micro-scale by evaluating peak CO concentrations at the project level. CO is a colorless, odorless, poisonous gas considered to be a serious threat to those who suffer from cardiovascular disease. High concentrations of CO tend to occur in areas of high traffic volumes or areas adjacent to a stationary source of the pollutant. CO emissions are associated with the incomplete combustion of fossil fuels in motor vehicles and are considered to be a good indicator of vehicle-induced air pollution.

II. Project Description / Alternatives

Project Study Area

The Virginia Department of Transportation (VDOT), in cooperation with the Federal Highway Administration (FHWA), is evaluating potential transportation improvements to address traffic conditions along an approximate three-mile section of the Interstate 95 (I-95) corridor, from the Route 3 Interchange (Exit 130) to just north of the Route 17 Interchange (Exit 133) in the City of Fredericksburg, and Stafford and Spotsylvania Counties, as shown in **Figure 1**.

The study area consists of lands surrounding the proposed project elements and includes areas where human activities could potentially be affected by the project. In addition, the study also includes an assessment of air quality conditions adjacent to the worst-case

signalized intersection in the vicinity of the project study area and the anticipated impact on air quality as a result of the proposed improvements.

Alternatives:

No-Build Alternative

The No-Build Alternative serves as a baseline of conditions for the comparison of the Build Alternative. The No-Build Alternative represents no modifications to the interstate or arterial roadway system other than the already planned and programmed improvements identified in the FAMPO 2040 Constrained Long-Range Plan (CLRP) and VDOT's Six Year Improvement Program (SYIP). However, it would allow for short-term restoration types of activities (safety and maintenance improvements, etc.) that maintain continuing operation of the existing interstate facility.

Build Alternative

The Build Alternative would include the construction of two parallel collector-distributor (C-D) lanes in each direction between the Route 3 and Route 17 interchanges on I-95 with a pair of braided ramps to separate heavy Route 3 and Route 17 ramp volumes. The I-95 northbound C-D lanes would start at the Route 3 eastbound to I-95 northbound on-ramp and end at the new I-95 northbound to Route 17 westbound/northbound flyover. The southbound C-D lanes would start just south of Route 17 and end at the I-95 southbound off-ramp to westbound Route 3. The project would also include new I-95 bridges in each direction across the Rappahannock River, reconstruction of the Route 17 interchange (Exit 133), improvements to both Route 3 and the Route 3 interchange (Exit 130) and improvements to the Virginia Welcome Center, as described further in the I-95 IMR and the Alternatives section of the Environmental Assessment. The project corridor, including the proposed improvements, is shown on **Figure 2** as well as **Figures 3-1** through **3-6**.

III. Existing Conditions

The proposed project is located in central Virginia in Stafford and Spotsylvania Counties and the City of Fredericksburg. The area is best categorized as a humid subtropical climate that averages approximately 43 inches of precipitation per year. The project area experiences cool winters and hot, humid summers. The average daily high temperature in July is 89 degrees Fahrenheit while the average daily low temperature in January is 22 degrees Fahrenheit.

Traffic Summary Information

Traffic forecasts were developed for the project for Existing (2013), Interim/Opening Year No-Build (2020), Interim/Opening Year Build (2020), Design Year No-Build (2040), and Design Year Build (2040) conditions for the project locations. As part of this effort, it was assumed that the I-95 Express Lanes in the project study area would be open for traffic for Design Year No-Build (2040) and Design Year Build (2040) conditions, which is consistent with the FAMPO 2040 CLRP. The traffic volumes used in the CO

hot-spot analysis are based on the AM and PM peak traffic volume projections developed for the June 30, 2014 draft *I-95 Interchange Modification Report (IMR), Improvements to I-95 between Exit 133 and Exit 130 (IMR)* by Michael Baker Jr., Inc., (Baker).

IV. Regulations / Criteria

Under the NEPA, federal agencies must consider environmental factors in the decision-making process. Changes in air quality, and the effects of such changes on human health and welfare, are among the factors to be considered. A project-level air quality analysis has been performed to assess the air quality impacts of the project, document the findings of the analysis, and make the findings available for review by the public and decision-makers. The findings of the analysis, as presented in this report, are summarized in the NEPA documentation.

As implemented by the Clean Air Act, the US Environmental Protection Agency (EPA) is required to set the NAAQS for pollutants considered harmful to public health and welfare. As shown in **Table 1**, there are currently two types of standards: Primary Standards that are intended to protect public health, and Secondary Standards that are intended to protect the public welfare (e.g., to protect against damage to crops, vegetation, buildings, and animals). Federal actions must not cause or contribute to any new violation of any standard, increase the frequency or severity of any existing violation, or delay timely attainment of any standard or required interim milestone.

Geographic regions that do not meet the NAAQS for one or more criteria pollutants are designated by EPA as “non-attainment areas.” Areas previously designated as non-attainment, but subsequently re-designated to attainment because they no longer violate the NAAQS, are designated as “maintenance areas” subject to maintenance plans to be developed and included in a state’s SIP. The project lies within an area designated as attainment/maintenance with the 1997 8-hour ozone NAAQS, and in attainment with all other NAAQS.

The federal transportation 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 non-attainment or has a maintenance plan” (40 CFR 93.102(b)). Transportation-related criteria pollutants, as specified in the conformity rule, include ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), and particulate matter less than 10 and 2.5 microns in diameter (PM₁₀ and PM_{2.5}, respectively). Regional conformity analysis requirements apply for plans and programs; hot-spot analysis requirements of 40 CFR 93.116 and 93.123 apply for projects.

On March 10, 2006, EPA released a rulemaking titled *PM_{2.5} and PM₁₀ Hot-Spot Analyses in Project-Level transportation Conformity Determinations for the New PM_{2.5} and Existing PM₁₀ National Ambient Air Quality Standards (40 CFR Part 93)*. This rulemaking established the criteria for determining which projects would be required to further analyze particulate emissions. In addition, the rule establishes the criteria for demonstrating conformity for PM_{2.5} standards, as well as updates the existing criteria for determining conformity for PM₁₀ areas.

Table 1
National Ambient Air Quality Standards

Pollutant	Primary Standards		Secondary Standards	
	Level	Averaging Time	Level	Averaging Time
Carbon Monoxide	9 ppm (10 µg/m ³)	8-hour ⁽¹⁾	None	
	35 ppm (40 µg/m ³)	1-hour ⁽¹⁾		
Lead	0.15 µg/m ³ ⁽²⁾	Rolling 3-Month Average	Same as Primary	
Nitrogen Dioxide	53 ppb (100 µg/m ³)	Annual (Arithmetic Mean)	Same as Primary	
	100 ppb	Annual (98 th Percentile, averaged over 3 years)		
Particulate Matter (PM ₁₀)	150 µg/m ³	24-hour ⁽³⁾	Same as Primary	
Particulate Matter (PM _{2.5})	12.0 µg/m ³	Annual ⁽⁴⁾ (Arithmetic Mean)	15.0 µg/m ³	
	35 µg/m ³	24-hour (98 th Percentile, averaged over 3 years) ⁽⁵⁾	Same as Primary	
Ozone	0.075 ppm (2008 std)	8-hour ⁽⁶⁾⁽⁷⁾	Same as Primary	
Sulfur Dioxide	75 ppb	1-hour ⁽⁸⁾	0.5 ppm (1300 µg/m ³)	3-hour ⁽¹⁾

⁽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 PM_{2.5} concentrations from single or multiple community-oriented monitors must not exceed 12.0 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⁾ Final rule signed March 12, 2008. The 1997 ozone standard (0.08 ppm, annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years) and related implementation rules remain in place. In 1997, EPA revoked the 1-hour ozone standard (0.12 ppm, not to be exceeded more than once per year) in all areas, although some areas have continued obligations under that standard (“anti-backsliding”). The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.

⁽⁸⁾ (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 ≤ 1.

(b) As of June 15, 2005, EPA has revoked the [1-hour ozone standard](#) in all areas except the fourteen 8-hour ozone non-attainment [Early Action Compact \(EAC\) Areas](#). For one of the 14 EAC areas (Denver, CO), the 1-hour standard was revoked on November 20, 2008. For the other 13 EAC areas, the 1-hour standard was revoked on April 15, 2009.

⁽⁸⁾ To attain this standard, the 3-year average of the 99th percentile of 1-hour concentrations at each population-oriented monitor within an area must not exceed 75 ppb (effective June 2, 2010).

Source: Table and footnotes above are excerpted from US Environmental Protection Agency website: <http://www.epa.gov/air/criteria.html> - Accessed on 8-7-14

On February 27, 2009, FHWA and VDOT finalized an agreement for addressing project-level CO air quality analyses in NEPA documents. Under this agreement, project-level CO air quality (hot-spot) analyses are conducted for projects that meet traffic and geometry-related criteria to satisfy NEPA requirements. Since the traffic criteria as specified in the agreement was exceeded for this project, a quantitative CO hot-spot analysis was completed and the results are summarized in **Section V**.

Modeling protocols for quantitative CO hot-spot analyses are to comply with the standards outlined in 40 CFR 51, Appendix W, “Guideline on Air Quality Models,” and guidelines in EPA’s “Guideline for Modeling Carbon Monoxide from Roadway Intersections” (EPA-454/R-92-005). In December 2010, EPA also published a guidance document titled *Using MOVES in Project-Level Carbon Monoxide Analyses* (<http://www.epa.gov/otaq/stateresources/transconf/policy/420b10041.pdf>) for completing project-level carbon monoxide analyses using MOVES.

On December 6, 2012, FHWA issued updated guidance titled *Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA*. The purpose of the memorandum was to update the September 2009 interim guidance that advised FHWA Division offices on when and how to analyze Mobile Source Air Toxics (MSAT) under the NEPA review process for highway projects.

The MSAT update reflects recent changes in methodology for conducting emissions analysis and new research in the MSAT arena, and EPA also released a new emission model, the Motor Vehicle Emissions Simulator (MOVES), in 2010. To prepare for this transition, FHWA updated the September 2009 Interim MSAT Guidance to incorporate the analysis conducted using MOVES. Based on FHWA's analysis using MOVES2010b, the latest version of MOVES, diesel particulate matter (diesel PM) has become the dominant MSAT of concern. The guidance also provides an update on the status of scientific research on air toxics. The update supersedes the September 2009 Interim Guidance and should be referenced in NEPA documentation. Additionally, the updated guidance reflects recent regulatory changes, projects national MSAT emission trends out to 2050 using EPA’s MOVES2010b model, and summarizes recent research efforts; however, it did not change any project analysis thresholds, recommendations, or guidelines.

The MSAT guidance includes specific criteria for determining which projects are to be considered exempt from MSAT analysis requirements and which may require a qualitative or quantitative analysis. In accordance with the guidance, the FHWA developed a tiered approach with three categories for analyzing MSAT in NEPA documents, depending on specific project circumstances. Those categories are listed below:

1. No analysis for projects with no potential for meaningful impacts;
2. Qualitative analysis for projects with low potential MSAT effects; or
3. Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects.

Projects considered exempt under Section 40 CFR 93.126 of the Federal Conformity Rule are also specifically designated as exempt from MSAT analysis requirements;

however this project was not found to meet the criteria in the first category listed above. In addition, projects considered for qualitative analysis typically include minor widening, a new interchange connecting an existing roadway with a new roadway, a new interchange connecting new roadways or minor improvements or expansions to intermodal centers or other projects that affect truck traffic. As stipulated in the guidance, the project does not meet the requirements for a qualitative analysis and therefore does not fit into the second category listed above. Finally, this project does create new capacity or add significant capacity to urban highways such as interstates, urban arterials, or urban collector-distributor routes with forecasted design year Average Annual Daily Traffic (AADT) volumes in the range of 140,000 to 150,000 or greater, and which are also in proximity to populated areas. Since the project does meet the traffic criteria that would require a quantitative MSAT analysis, it is best characterized as a project consistent with the third category listed above. As such, a quantitative assessment of MSAT was completed and the results are summarized in **Section VII**.

VDOT's May 2009 *Consultant Guide, Air Quality Project-Level Analysis, Revision 18*, provides guidelines and standards for conducting air quality analyses for transportation projects in Virginia. The guide complies with and supplements FHWA and EPA regulations and guidelines. The air quality analyses presented in this report are consistent with the guide.

In March of 2010, the EPA published a Federal Register Notice of Availability that approved MOVES2010 as the EPA's tool for estimating emissions of volatile organic compounds (VOCs), nitrogen oxide (NO_x), CO, PM₁₀, PM_{2.5} and other pollutants. In August of 2010, EPA approved an updated version of the MOVES model (MOVES2010a) for official use. It incorporated new car and light truck greenhouse gas emission standards that were published May 2, 2010 as well as a number of other minor improvements. More recently, the latest version of MOVES, MOVES2010b, was released in April 2012, and provides more flexibility for varying inputs with increased functionality of the software. MOVES2010b did not significantly affect the criteria pollutant emissions results when compared to MOVES2010 or MOVES2010a, and was therefore not considered a new model that would initiate a new grace period.

On December 20, 2010, EPA also released final guidance for conducting quantitative hot-spot analyses in PM_{2.5} and PM₁₀ non-attainment and maintenance areas titled, *Transportation Conformity Guidance for Quantitative Hot-spot Analyses in PM_{2.5} and PM₁₀ Non-attainment and Maintenance Areas, EPA-420-B-10-040*. Starting in December 2012, the new guidance must be used by state and local agencies to conduct quantitative PM hot-spot analyses for new or expanded highways or transit projects with significant levels of diesel traffic that are located in PM_{2.5} and PM₁₀ non-attainment and maintenance areas that are found to be of air quality concern. However, this project is located in an area that is in attainment with the PM_{2.5} and PM₁₀ NAAQS and therefore transportation conformity requirements do not apply. Additional documentation on this determination can be found in **Section VI** of this report.

Regional Transportation Conformity Requirements

EPA promulgated the Transportation Conformity Rule concerning the applicability, procedures, and criteria that transportation agencies must use in analyzing and determining conformity of transportation projects. The Transportation Conformity Rule

applies to federally-funded transportation projects in certain areas that have violated one or more of the NAAQS (non-attainment/maintenance areas). As discussed previously, this project lies within an area designated as attainment/maintenance with the 1997 8-hour ozone NAAQS, and in attainment with all other NAAQS. Additionally, EPA revoked the 1997 8-hour ozone standard for transportation conformity purposes as of July 20, 2013, and therefore transportation conformity requirements do not currently apply in the project area. Additional documentation can be referenced in **Section IX** of this report.

V. Carbon Monoxide Analysis

The purpose of this hot-spot analysis is to identify “worst-case” carbon monoxide (CO) concentrations throughout the project corridor in order to determine if CO exceedances could occur as a result of the proposed improvements.

CO is a stable gas that disperses in predictable ways in the atmosphere. Therefore, computer modeling can be used to assess both existing and expected future atmospheric concentrations of CO at selected receptor sites. The modeling inputs and procedures were developed in accordance with EPA’s *Guideline for Modeling Carbon Monoxide from Roadway Intersections*; EPA’s *Using MOVES in Project-Level Carbon Monoxide Analyses*, and VDOT’s May 2009 *Consultant Guide, Air Quality Project-Level Analysis, Revision 18*.

The air quality modeling approach included the use of two computer models. Based on traffic data and historic climatic data, CO emissions were calculated using EPA’s Motor Vehicle Emission Simulator (MOVES2010b) model. Specific modeling inputs including vehicle age distribution and fuel type formulations were obtained from the Virginia Department of Environmental Quality (VDEQ) and VDOT air quality staff. In addition, the roadway grade information required for input into MOVES2010b was based on a combination of resources including: profiles developed in conjunction with the proposed improvements, USGS elevation data from GIS files, and/or USGS contour mapping to represent the terrain along and adjacent to the study area.

In order to calculate emission rates from the MOVES2010b model, the peak hour traffic volumes and the congested speed for that hour were used. In addition, the urban restricted and unrestricted road types were used as appropriate. Source type hour fractions for each roadway link are based on a combination of count data and the vehicle populations data set provided by VDOT. Count data was used as the basis for the source type hour fractions and was summarized into the 13 FHWA vehicle classifications. These 13 classifications were then condensed into the six primary vehicle classifications of the Highway Performance Monitoring System (HPMS). In order to convert these six HPMS categories into the 13 MOVES source type categories, the vehicle population data set was used to calculate fractions of the total vehicle population within each HPMS classification category, as appropriate, for each MOVES vehicle type. These fractions were then applied to the appropriate HPMS vehicle classification counts to calculate MOVES vehicle counts for each of the 13 source type categories, and then source type hour fractions were subsequently calculated for each roadway type.

Once generated using the MOVES2010b model, the CO emission rates were then applied within the CAL3QHC air quality dispersion model. This model is used to estimate the

dispersion of CO from highway sources to sensitive receptor locations by representing the geometric relationship between roadways and receptor sites. Factors taken into account in this model include pollutant source strength, wind speed, wind angle, atmospheric stability, roadway length and width, surface roughness, vehicle volume, emission factor, and background CO concentrations. This model is fully documented in the *User's Guide to CAL3QHC, Version 2.0 (EPA-454/R-92-006)*, September 1995.

After modeling the worst-case CO concentrations for the Existing (2013), Interim/Opening Year No-Build (2020), Interim/Opening Year Build (2020), Design Year No-Build (2040), and Design Year Build (2040) scenarios and including the appropriate background concentrations, these levels are then compared to the CO NAAQS to determine compliance. The CO standards are 35 ppm and 9 ppm for the second highest one-hour and eight-hour periods, respectively (shown in **Table 1**). EPA has designed and adopted these standards in an effort to protect public health and welfare.

The air quality models were designed to replicate traffic operations associated with the existing and future conditions at all roadway and intersection locations. As stipulated by EPA's *Guideline for Modeling Carbon Monoxide from Roadway Intersections*, each receptor represents an area where the public would have continuous access to the immediate vicinity. The greatest concentrations of CO tend to occur in the winter months when automobiles can experience incomplete combustion of fuel due to low temperatures. For this reason, modeling was performed to represent wintertime (January) conditions. The modeling inputs used in MOVES2010b and CAL3QHC are summarized in **Table 2** and **Table 3**.

Table 2
Inputs to MOVES2010b

Parameter	Data
Evaluation Month	January
Evaluation Year(s)	2013/2020/2040
Days	Weekdays
Evaluation Hour	5:00 PM
Links (including length, volume, average speed, and grade)	Developed by MT
Link Source Type Hour Fractions	Developed by MT (based on count data and vehicle population)
Temperature (Fahrenheit)	22*
Absolute Humidity	75*
Vehicle Age Distribution	Provided by VDOT
I/M Programs	Provided by VDOT (Stafford County Only)
Fuel Supply	VDEQ provided data
Fuel Formulations	VDEQ provided data

Source: Developed by the Project Team during the air quality modeling protocol process.

** VDOT's Consultant Guide – Air Quality Project-Level Analysis, Revision 18 (May 2009).*

**Table 3
CAL3QHC Worst-Case Inputs**

Parameter		Data
Surface Roughness Coefficient		175 cm (urban)
Background CO Concentrations (parts per million) (project located in northern Virginia)	1-hour	2.9 ppm
	8-hour	2.3 ppm
Wind Speed (meters per second)		1 m/s
Stability Class		Urban - D
Mixing Height		1000 meters
Receptor Height		5.9 feet
Persistence Factor		0.7

Source: VDOT's Consultant Guide – Air Quality Project-Level Analysis, Revision 18 (May 2009).

In order to identify the worst-case intersections to be evaluated in the CO hot-spot analysis, EPA guidance suggests ranking the top intersection locations based on traffic volumes and level of service (LOS). However, the proposed improvements will consist of widening of a limited access interstate with a northern and southern interchange area. As such, several receptors were selected adjacent to the northern and southern interchange areas where traffic has the largest potential to queue along the project corridor. Therefore, for the purposes of this portion of the assessment, both the northern and southern interchange areas were included in the analysis, as well as select locations along the proposed improvement that best represent the areas where worst-case CO concentrations would likely occur.


Additionally, the worst-case signalized intersection was included in the air study to determine compliance with the CO NAAQS, and for comparisons between No-Build and Build conditions. A ranking of the signalized intersections along the existing roadway network in the vicinity of the study area was completed in accordance with EPA Guidance and is included in **Table 4**. For the purposes of the CO hot-spot analysis, the worst-case signalized intersection selected for the assessment is identified below:

- I-95 Exit 130 – Route 3/Carl D Silver Parkway/Mall Court – **Rank 1** (PM Peak)

The worst-case intersection identified above was selected based on having the highest peak-hour traffic volumes when compared to other signalized intersections along the project corridor, as well as the having the worst intersection level-of-service (LOS) and delay. In addition, the intersection was chosen to be analyzed using PM peak-hour traffic volumes since they were generally found to be higher than AM peak-hour traffic volumes and therefore represent more worst-case conditions. Although minor improvements are proposed at this intersection to improve traffic flow, modeling was performed that included the existing footprint in each analysis year as a worst-case assumption. Additionally, modeling and receptor site selection was conducted in accordance with EPA's *Guideline for Modeling Carbon Monoxide from Roadway Intersections*. The air quality modeling receptors evaluated at the signalized intersection are shown in **Figure 3-2**.

Table 4
Rappahannock River Crossing - Signalized Intersection Summary Data

Intersection	Existing (2013)				2020 Build				2040 Build				Overall Rank
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		
	Volume	LOS	Volume	LOS	Volume	LOS	Volume	LOS	Volume	LOS	Volume	LOS	
Route 3/Central Park Blvd/Mall Dr	4436	B	6116	F	5000	C	6820	F	6380	F	8640	F	3
Route 3/Carl D Silver Pkwy/Mall Ct	5051	C	7031	F	5700	C	7600	F	7215	F	10030	F	1
Route 3/Gateway Blvd/Ramseur St	3572	C	4157	C	4275	C	4835	C	5215	D	5935	D	5
Route 17/McLane Dr	4135	C	4307	B	4875	D	5060	C	6925	F	7235	F	4
Route 17/Sanford Dr/Stanstead Rd	4869	D	5475	F	5670	D	6400	F	7960	F	8930	F	2
Route 17/ Short St	2353	C	2977	F	2400	D	3000	F	3030	F	3910	F	6
Rtoute 17/Ramp F		N/A			4040	A	3820	A	6330	A	6050	A	8
SB Ramp and WB Route 3		N/A			1700	C	3990	F	2135	C	5025	F	9
Alternative 3A - Route 3 and NB Ramp		N/A			4310	C	4530	B	6140	C	5605	C	6
Alternative 4A - Route 3 and NB Ramp		N/A			2300	B	3990	B	3540	B	4905	C	10

 Indicates intersection selected for inclusion in the CO hot-spot modeling analysis

CO Receptor Locations

As stipulated by EPA's *Guideline for Modeling Carbon Monoxide from Roadway Intersections*, selection of potential air quality receptors used the following criteria:

- Select areas of expected 1-hour and 8-hour maximum concentrations;
- Select areas where the general public has continuous access over specific time periods; and/or
- Reasonable receptor locations.

As referenced in EPA's guidance, each receptor represents an area where the public would have continuous access to the immediate vicinity. Areas were selected based on generalized assessments of where human activity is likely to coincide with the highest CO concentrations.

The locations selected for analysis include: a playground associated with the Bragg Hill Family Life Center, Hilton Garden Inn, Days Inn Fredericksburg, Motel 6 Fredericksburg North, Howard Johnson Inn Fredericksburg, as well as residential and commercial areas adjacent to the interchanges and the worst-case signalized intersection selected for the air study. If the projected peak CO concentrations at the worst-case locations selected in the analysis are below the CO NAAQS, then it is assumed that other locations within the project corridor would also remain below the CO NAAQS. **Figures 3-1** through **3-6** show the sensitive receptor locations along the proposed Build Alternative. **Table 5** provides a summary of the average daily traffic (ADT) on each of the roadway links in the vicinity of the project for the Existing (2013), Interim/Opening Year No-Build (2020), Interim/Opening Year Build (2020), Design Year No-Build (2040), and Design Year Build (2040) conditions.

The study area includes a wide variety of land use types, roadway features, and areas where the public has continuous access adjacent to the proposed improvements. The area is comprised primarily of mixed commercial and residential land uses adjacent to the project corridor.

Analysis Methodologies & Results

The CAL3QHC computer dispersion model was used to predict the worst-case 1-hour and 8-hour CO concentrations for Existing (2013), Interim/Opening Year No-Build (2020), Interim/Opening Year Build (2020), Design Year No-Build (2040), and Design Year Build (2040) conditions. Relevant traffic data used in the analysis was developed and provided by Baker traffic engineers. Worst-case traffic operations and atmospheric conditions were incorporated to predict worst-case CO concentrations. Based on review of the traffic data, the CO modeling analysis along the project corridor focused on the PM peak-hour conditions since PM traffic volumes were found to be generally higher than AM volumes and therefore were considered to represent more worst-case conditions. Worst-case CO concentrations, calculated by adding together the background concentration to the projected peak CO concentration for each location, scenarios, and years considered in the project area, are shown in **Table 6** and **Table 7**. Representative 1-hour and 8-hour background concentrations of 2.9 ppm and 2.3 ppm, respectively, were obtained from VDOT's *Consultant Guide*. In addition, a persistence factor of 0.7 was applied to the 1-hour CO concentrations to project the 8-hour CO concentrations as stipulated in EPA guidance. Furthermore, to project worst-case CO concentrations, a

Table 5
Rappahannock River Crossing - Average Daily Traffic (ADT) Summary

Road	Description	2013	2020		2040	
		Existing	No Build	Build	No Build	Build
I-95 SB	North of Ramp to Rte 3*	75,800	87,600	65,500	109,800	85,900
I-95 NB	North of Ramp to Rte 3	76,800	88,800	57,800	116,200	76,400
I-95 SB	South of Ramp to Rte 3	57,100	67,100	67,100	84,000	87,800
I-95 NB	South of Ramp to Rte 3	58,000	68,200	68,200	90,500	90,500
I-95 SB	North of Ramp to Rte 17	66,400	76,300	78,300	92,900	99,700
I-95 NB	North of Ramp to Rte 17	68,300	78,600	80,600	101,100	104,100
I-95 SB	South of Ramp to Rte 17*	75,800	87,600	63,200	109,800	82,600
I-95 NB	South of Ramp to Rte 17	76,800	88,800	57,800	116,200	76,400
Rte 3 WB	West of Ramps	30,800	34,100	34,100	43,300	43,300
Rte 3 EB	East of Ramps	24,800	26,700	30,100	32,300	37,000
Rte 3 EB	East of Ramps	25,000	27,100	29,900	32,600	36,700
Rte 3 EB	West of Ramps	39,900	44,000	45,200	55,800	57,500
Rte 17 WB	West of Ramps	32,200	37,700	37,700	54,000	54,000
Rte 17 WB	East of Ramps	16,700	18,700	15,800	24,800	20,500
Rte 17 EB	East of Ramps	22,400	25,200	22,700	33,500	29,800
Rte 17 EB	West of Ramps	32,500	38,200	38,200	54,300	54,300
Ramp M	I-95 SB to Rte 3 WB	22,500	24,900	27,000	31,700	34,700
Ramp N	Rte 3 WB to I-95 SB	3,300	3,500	3,500	4,100	4,100
Ramp K	I-95 NB to Rte 3 WB	6,500	7,200	7,200	9,200	9,200
Ramp L	Rte 3 WB to I-95 NB	9,100	9,700	12,500	11,500	15,500
Ramp O	I-95 SB to Rte 3 EB	7,600	8,200	11,000	9,700	13,700
Ramp P	Rte3 EB to I-95 SB	8,200	9,000	9,000	11,500	11,500
Ramp I	I-95 NB to Rte 3 EB	3,900	4,200	4,200	5,000	5,000
Ramp J	Rte 3 EB to I-95 NB	20,200	22,300	NA	28,300	NA
Ramp E	I-95 SB to Rte 17 WB	7,400	8,700	8,700	12,500	12,500
Ramp F	Rte 17 WB to I-95 SB	2,100	2,300	NA	2,900	NA
Ramp C	I-95 NB to Rte 17 WB	18,300	21,400	23,700	30,600	33,700
Ramp D	Rte 17 WB to I-95 NB	6,100	6,700	6,100	8,500	7,700
Ramp G	I-95 SB to Rte 17 EB	6,400	7,000	6,400	8,900	8,100
Ramp H	Rte 17 EB to I-95 SB	21,100	24,800	27,100	35,400	38,600
Ramp A	I-95 NB to Rte 17 EB	2,900	3,200	3,200	4,100	4,100
Ramp B	Rte 17 EB to I-95 NB	6,600	7,800	7,800	11,100	11,100
CD Road NB	Between Rte 3 and Rte 17	NA	NA	29,300	NA	46,800
CD Road SB	Between Rte 3 and Rte 17	NA	NA	35,900	NA	38,000
Access Ramp	Connector Road to I-95 SB	NA	NA	2,400	NA	3,400
Express Lane	NB Express Lane	NA	NA	NA	6,700	6,700
Express Lane	SB Express Lane	NA	NA	NA	11,600	7,800

* These two locations are separated by an access ramp for the Build Conditions

Table 6
Carbon Monoxide Hot-Spot Analysis
Peak 1-Hour and 8-Hour CO Concentration Summary (ppm)

	Receptor ID	Existing (2013)		2020 Interim/Opening Year No-Build		2020 Interim/Opening Year Build		2040 Design Year No-Build		2040 Design Year Build	
		1-Hour	8-Hour	1-Hour	8-Hour	1-Hour	8-Hour	1-Hour	8-Hour	1-Hour	8-Hour
Rappahannock River Crossing Project	A01	3.2	2.5	3.1	2.4	3.1	2.4	3.2	2.5	3.2	2.5
	A02	3.0	2.4	3.0	2.4	2.9	2.3	3.0	2.4	2.9	2.3
	A03	3.1	2.4	3.1	2.4	3.1	2.4	3.1	2.4	3.1	2.4
	A04	3.2	2.5	3.1	2.4	3.2	2.5	3.2	2.5	3.2	2.5
	A05	3.2	2.5	3.1	2.4	3.1	2.4	3.1	2.4	3.2	2.5
	A06	3.4	2.7	3.3	2.6	3.3	2.6	3.3	2.6	3.3	2.6
	A07	3.1	2.4	3.0	2.4	3.0	2.4	3.0	2.4	3.0	2.4
	A08	3.4	2.7	3.3	2.6	3.2	2.5	3.3	2.6	3.3	2.6
	A09	3.4	2.7	3.3	2.6	3.4	2.7	3.2	2.5	3.4	2.7
	A10	3.4	2.7	3.4	2.7	3.3	2.6	3.4	2.7	3.5	2.7
	A11	3.3	2.6	3.3	2.6	3.4	2.7	3.4	2.7	3.4	2.7
	A12	3.5	2.7	3.4	2.7	3.6	2.8	3.4	2.7	3.7	2.9
	A13	3.3	2.6	3.3	2.6	3.3	2.6	3.4	2.7	3.4	2.7
	A14	3.1	2.4	3.0	2.4	2.9	2.3	3.0	2.4	3.0	2.4
	A15	3.2	2.5	3.1	2.4	3.1	2.4	3.1	2.4	3.2	2.5
	A16	3.1	2.4	3.1	2.4	3.1	2.4	3.1	2.4	3.0	2.4
	A17	3.0	2.4	2.9	2.3	2.9	2.3	2.9	2.3	2.9	2.3
	A18	3.1	2.4	3.0	2.4	3.0	2.4	3.0	2.4	3.0	2.4
	A19	3.0	2.4	3.0	2.4	3.0	2.4	2.9	2.3	2.9	2.3
	A20	3.1	2.4	3.0	2.4	3.0	2.4	3.0	2.4	3.0	2.4
	A21	3.0	2.4	3.0	2.4	3.0	2.4	2.9	2.3	3.0	2.4
	A22	3.1	2.4	3.0	2.4	3.1	2.4	2.9	2.3	3.1	2.4

Notes:

- 1-Hour and 8-Hour concentrations shown above are in parts per million (ppm).
- 1-Hour concentrations predicted using CAL3QHC computer dispersion model and assumes a background concentration of 2.9 ppm.
- 8-Hour concentrations were calculated by applying a persistence factor of 0.7 to the 1-Hour concentration, as per the VDOT Consultant Guide, Air Quality Project Level Analysis, Revision 18, May 2009. The persistence factor of 0.7 is based on the guidance in the Guideline for Modeling Carbon Monoxide from Roadway Intersections, EPA, November 1992. Additionally, the 8-hour concentration assumes a 2.3 ppm background concentration as per the VDOT Consultant Guide.
- Highlighted cells represent highest CO concentrations per analysis year.

Table 7
Carbon Monoxide Hot-Spot Analysis
Peak 1-Hour and 8-Hour CO Concentration Summary (ppm)

	Receptor ID	Existing (2013)		2020 Interim/Opening Year No-Build		2020 Interim/Opening Year Build		2040 Design Year No-Build		2040 Design Year Build	
		1-Hour	8-Hour	1-Hour	8-Hour	1-Hour	8-Hour	1-Hour	8-Hour	1-Hour	8-Hour
Route 3 & Carl D Silver Parkway Signalized Intersection	B01	3.9	3.0	3.4	2.7	3.3	2.6	3.2	2.5	3.3	2.6
	B02	3.9	3.0	3.4	2.7	3.4	2.7	3.3	2.6	3.3	2.6
	B03	4.5	3.4	3.6	2.8	3.5	2.7	3.4	2.7	3.4	2.7
	B04	4.3	3.3	3.6	2.8	3.6	2.8	3.6	2.8	3.6	2.8
	B05	3.9	3.0	3.6	2.8	3.5	2.7	3.5	2.7	3.6	2.8
	B06	3.9	3.0	3.6	2.8	3.6	2.8	3.5	2.7	3.6	2.8
	B07	3.5	2.7	3.3	2.6	3.3	2.6	3.3	2.6	3.3	2.6
	B08	3.6	2.8	3.3	2.6	3.3	2.6	3.3	2.6	3.3	2.6
	B09	3.7	2.9	3.5	2.7	3.4	2.7	3.4	2.7	3.4	2.7
	B10	3.6	2.8	3.3	2.6	3.3	2.6	3.3	2.6	3.3	2.6
	B11	3.7	2.9	3.3	2.6	3.3	2.6	3.2	2.5	3.3	2.6
	B12	3.6	2.8	3.3	2.6	3.0	2.4	3.3	2.6	3.3	2.6
	B13	3.9	3.0	3.6	2.8	3.4	2.7	3.5	2.7	3.4	2.7
	B14	4.0	3.1	3.6	2.8	3.5	2.7	3.5	2.7	3.4	2.7
	B15	3.9	3.0	3.6	2.8	3.5	2.7	3.5	2.7	3.4	2.7
	B16	3.9	3.0	3.6	2.8	3.5	2.7	3.5	2.7	3.6	2.8
	B17	4.3	3.3	3.5	2.7	3.4	2.7	3.6	2.8	3.5	2.7
	B18	3.6	2.8	3.4	2.7	3.4	2.7	3.3	2.6	3.4	2.7

Notes:

- 1-Hour and 8-Hour concentrations shown above are in parts per million (ppm).
- 1-Hour concentrations predicted using CAL3QHC computer dispersion model and assumes a background concentration of 2.9 ppm.
- 8-Hour concentrations were calculated by applying a persistence factor of 0.7 to the 1-Hour concentration, as per the VDOT Consultant Guide, Air Quality Project Level Analysis, Revision 18, May 2009. The persistence factor of 0.7 is based on the guidance in the Guideline for Modeling Carbon Monoxide from Roadway Intersections, EPA, November 1992. Additionally, the 8-hour concentration assumes a 2.3 ppm background concentration as per the VDOT Consultant Guide.
- Highlighted cells represent highest CO concentrations per analysis year.

surface roughness coefficient of 175 cm was assumed for areas along the project corridor to represent urban conditions. The surface roughness coefficient used in the analysis was taken from VDOT's *Consultant Guide*. Additional assumptions in the analysis can be found in **Appendix E**.

Table 6 provides a summary of the worst-case CO concentrations at sensitive receptors selected along the proposed project corridor for each analysis year. As shown in **Table 6** (corresponding to receptor locations shown in **Figure 3-1** through **Figure 3-6**), the worst-case 1-hour and 8-hour CO concentrations under Existing (2013) conditions were projected at 3.5 and 2.7 ppm, respectively, including the assumed background concentration of 2.9 and 2.3 ppm for the 1-hour and 8-hour CO standards, respectively. Under Interim/Opening Year No-Build (2020) conditions, the highest 1-hour and 8-hour CO concentrations were projected to be 3.4 and 2.7 ppm, respectively. Under Interim/Opening Year Build (2020) conditions, the highest 1-hour and 8-hour CO concentrations were projected to be 3.6 and 2.8 ppm, respectively. Under Design Year No-Build (2040) conditions, the highest 1-hour and 8-hour CO concentrations were projected to be 3.4 and 2.7 ppm, respectively. Under Design Year Build (2040) conditions, the highest 1-hour and 8-hour CO concentrations were projected to be 3.7 and 2.9 ppm, respectively.

The highest CO concentrations for Existing (2013) conditions were projected to occur at receptor site A12, which represents an open area adjacent to a parking lot. The highest CO concentrations for Interim/Opening Year No-Build (2020) conditions were projected to occur at receptor sites A10 and A12, which both represent an open area adjacent to a parking lot. The highest CO concentrations for Interim/Opening Year Build (2020) conditions were projected to occur at receptor site A12. The highest CO concentrations for Design Year No-Build (2040) conditions were projected to occur at receptor sites A10, A11, A12 and A13, which all represent open areas adjacent to parking lots. The highest CO concentrations for Design Year Build (2040) conditions were project to occur at receptor site A12.

In addition to the selected receptors along the project corridor, additional CO hot-spot modeling was performed at the worst-case signalized intersection within the project study area as described earlier. The results of the CO hot-spot modeling analysis at this intersection are summarized in **Table 7**. Including the assumed background concentrations of 2.9 and 2.3 ppm for the 1-hour and 8-hour standards, respectively, the highest 1-hour and 8-hour CO concentrations under Existing (2013) conditions were projected at 4.5 and 3.4 ppm, respectively. Under Interim/Opening Year No-Build (2020) conditions, the highest 1-hour and 8-hour CO concentrations were projected to be 3.6 and 2.8 ppm, respectively. Under Interim/Opening Year Build (2020) conditions, the highest 1-hour and 8-hour CO concentrations were projected to be 3.6 and 2.8 ppm, respectively. Under Design Year No-Build (2040) conditions, the highest 1-hour and 8-hour CO concentrations were projected to be 3.6 and 2.8 ppm, respectively. Under Design Year Build (2040) conditions, the highest 1-hour and 8-hour CO concentrations were projected to be 3.6 and 2.8 ppm, respectively. The highest CO concentration for the Existing (2013) condition was projected at receptor site B03, which represents an open area adjacent to a parking lot. The highest CO concentration for the Interim/Opening Year No-Build (2020) condition was projected at receptor sites B03, B04, B05, B06, B13, B14, B15 and B16 which all represent open areas adjacent to parking lots. The highest CO concentration for the Interim/Opening Year Build (2020) condition was

projected at receptor sites B04 and B06. The highest CO concentration for the Design Year No-Build (2040) condition was projected at receptor sites B04 and B17 which both represent open areas adjacent to parking lots. The highest CO concentration for the Design Year No-Build (2040) condition was projected at receptor sites B04, B05, B06 and B16 which all represent open areas adjacent to a parking lot.

Under each scenario for each project location, the worst-case 1-hour and 8-hour CO concentrations are projected to be well below the CO NAAQS of 35 ppm and 9 ppm, respectively. Since the projected 1-hour and 8-hour CO concentrations do not exceed the CO NAAQS at each of the worst-case locations chosen for analysis throughout the existing and new project corridors, it is assumed that all of the other locations within the study area would also remain below the CO NAAQS. Therefore, all project-level NEPA requirements pertaining to CO have been met.

VI. Fine Particulate Matter

Particle pollution is comprised of a mixture of solid particles and liquid droplets found in the atmosphere. The particles are a combination of several items including dust, dirt, soot, and smoke, and they can vary in size. Particulate matter (PM) created by human activity includes, but is not limited to, the following sources: wood stoves, industry and power plants, and emissions from motor vehicles. It can also be formed in the atmosphere from gases, including sulfur dioxide, nitrogen dioxide, and volatile organic compounds (VOC).

Particle pollution includes "inhalable coarse particles" with diameters larger than 2.5 microns and smaller than 10 microns and "fine particles" with diameters 2.5 microns and smaller. The average human hair is about 70 microns in diameter – making it 30 times larger than the largest fine particle.

The project is located in Stafford and Spotsylvania Counties and the City of Fredericksburg, which are all areas designated as attainment for the PM_{2.5} and PM₁₀ NAAQS. As such, transportation conformity requirements pertaining to PM do not apply to this project, and therefore no further analysis is required.

VII. Mobile Source Air Toxics

In addition to the criteria air pollutants for which there are NAAQS, EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources, and stationary sources (e.g., factories or refineries). MSAT are a subset of the 188 air toxics defined by the Clean Air Act. EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (*Federal Register*, Vol. 72, No. 37, page 8430, February 26, 2007) and identified seven compounds of particular concern: acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. These are compounds that EPA's 1999 *National-Scale Air Toxics Assessment* (NATA) identified as the most significant contributors to cancer and non-cancer health risk from breathing outdoor air toxics and that have a significant contribution from mobile sources.

On September 30, 2009, FHWA issued *Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents*. This interim guidance update reflects recent regulatory changes; addresses stakeholder requests to broaden the horizon years of emission trends performed with MOBILE6.2; and updates stakeholders on the status of scientific research on air toxics.

On December 6, 2012, FHWA released another update to reflect recent changes in methodology for conducting emissions analysis and new research for MSAT, such as the use MOVES2010b that was discussed in **Section IV – Regulations and Criteria**.

MOVES2010b includes all air toxic pollutants in NATA that are emitted by mobile sources. EPA has incorporated more recent data into MOVES2010b to update and enhance the quality of MSAT emission estimates. These data reflect advanced emission control technology and modern fuels, plus additional data for older technology vehicles. Based on FHWA analysis using EPA's MOVES2010b model, even if vehicle miles travelled (VMT) increases 102 percent as assumed from 2010 to 2050, a combined reduction of 83 percent in the total annual emissions for the priority MSAT is projected for the same time period. The results from this analysis are shown in **Exhibit A**.

Technical shortcomings of dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT concentrations and the effects of this project. However, even though reliable methods do not exist to accurately estimate the health impacts of MSAT at the project level, it is possible to qualitatively assess the levels of future MSAT emissions under the project.

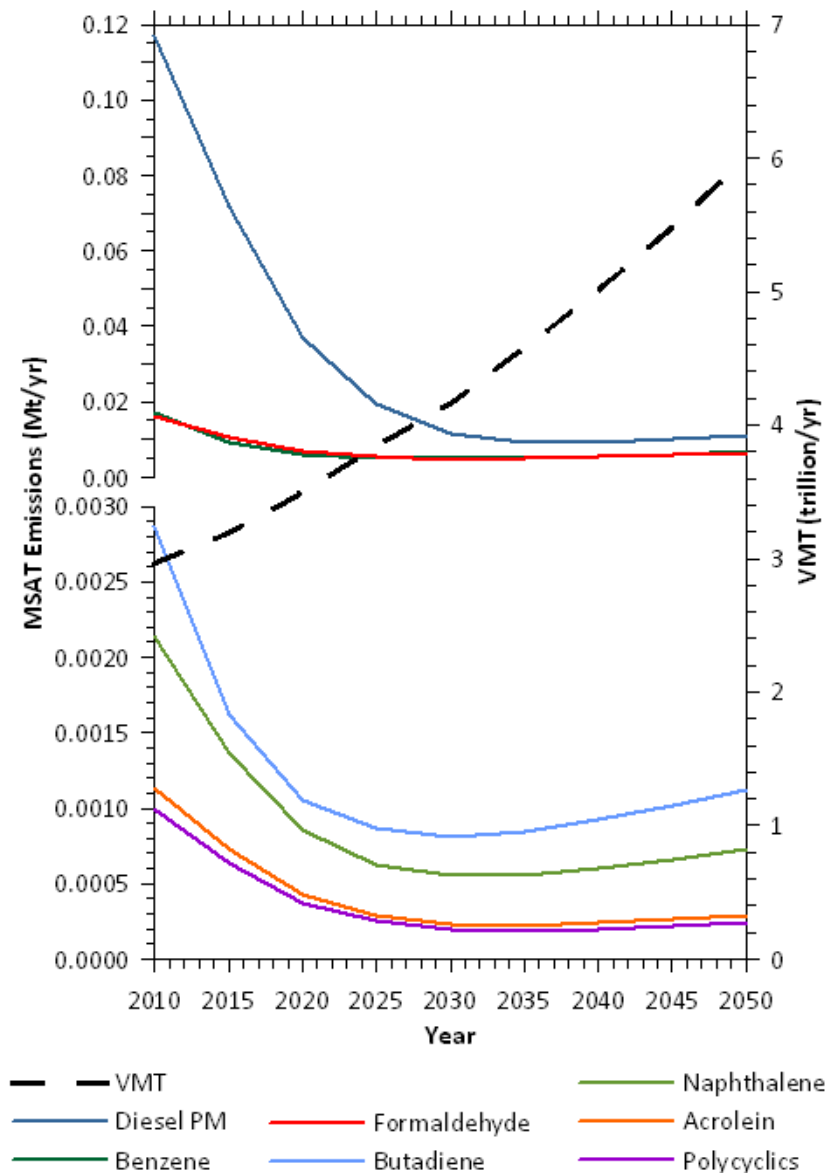
Incomplete or Unavailable Information for Project-Specific MSAT Health Impacts Analysis

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's *Interim Guidance Update on Mobile Source Air*

Exhibit A
NATIONAL MSAT EMISSION TRENDS 2010 – 2050
FOR VEHICLES OPERATING ON ROADWAYS USING EPA'S MOVES2010b
MODEL



Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, <http://pubs.healtheffects.org/view.php?id=282>) or in the future as vehicle emissions substantially decrease (HEI, <http://pubs.healtheffects.org/view.php?id=306>).

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts - each step in the process building on the model predictions obtained in the previous step. All are

encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70-year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (<http://pubs.healtheffects.org/view.php?id=282>). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA (<http://www.epa.gov/risk/basicinformation.htm#g>) and the HEI (<http://pubs.healtheffects.org/getfile.php?u=395>) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine a "safe" or "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than safe or acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision-makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, which are better suited for quantitative analysis.

Quantitative Analysis Methodology and Results

Because of the uncertainties outlined above, a credible quantitative assessment of the effects of air toxic emissions impacts on human health cannot be made at the project level. However, available tools do allow us to reasonably predict relative emissions changes between alternatives for large projects such as this one, where projected traffic volumes are high (Design Year 2040 AADT is projected to be in excess of 140,000 to 150,000 vehicles per day on some sections). Accordingly, a quantitative MSAT analysis has been conducted to compare anticipated MSAT emissions under Existing Conditions and for the No-Build Conditions for Interim and Design Years. In addition, MSAT emissions were generated for the Opening/Interim as well as the Design Years for the Build Alternative. The MSAT emissions analysis performed for this study reflects methodologies developed by FHWA and recommended in the 2012 *Interim Guidance Update* mentioned earlier and the recommendations contained within FHWA's *Quick Start Guide for Using MOVES for NEPA MSAT Analysis*. The following describes the general approach used for the MSAT analysis.

The quantitative MSAT analysis was conducted using roadway links from the Fredericksburg Area Metropolitan Planning Organization (FAMPO) travel demand model. The travel demand model encompasses a large area around Fredericksburg and includes portions of Stafford, Spotsylvania, King George and Caroline Counties as well as the City of Fredericksburg. For the purposes of the MSAT analysis, only the “affected network” portion of the model area was analyzed. The “affected network” is the geographic area surrounding the study corridor that is affected by the project, and only includes those roadway links that experience a +/- 5% change in traffic volume for the Build Alternative compared to the No-Build Alternative. A map depicting the “affected network” can be found in **Appendix D** of this report. The “affected network” has the following approximate boundaries:

- Northern areas extend to the Courthouse Road I-95 overpass near Stafford (Exit 140).
- Southern areas extend to the I-95 / US 1 Interchange (Exit 126).
- Western areas include roadway links extending 3 miles west of I-95.
- Eastern areas extend outward approximately 4 miles and include the US 1 corridor.

As discussed above, the affected network travelshed was identified using the FAMPO travel demand model regional transportation network. The affected network varies along the project corridor and extends out approximately 0.5 to 4 miles, which occurs primarily on the eastern side of the project corridor as a result of the existing roadway network.

The following data sets were used from the FAMPO Travel Demand Model:

- AADT, peak-hour volumes and diurnal traffic distributions for I-95 and other roadways in the affected network.
- Consistent with the methodology agreed upon by VDOT and FHWA in the development of the draft *I-95 Interchange Modification Report (IMR)*, *Improvements to I-95 between Exit 133 and Exit 130 (IMR)* June 30, 2014, traffic projections from the FAMPO model for the horizon years 2025 and 2035 were

used to represent the 2020 and 2040 conditions, respectively. In addition, using projected 2025 traffic volumes to represent 2020 conditions represents a worst-case assumption. Additional justification regarding these assumptions can be found on pages A-1, B-1, and B-11 of the IMR.

- The road type distribution was based on the traffic volumes and functional class of the roadways and the area designation from the Travel Demand Model within the affected network. The Interstate (I-95) was assigned to MOVES2010b road type category 4 which represent urban restricted roadways, while the majority of the other roads were assigned to MOVES2010b road type category 5 which represent urban unrestricted roadways.
- Estimated travel speeds for congested periods and free-flow conditions
 - Speed distributions were based on traffic volumes and congested speeds provided by the Travel Demand Model. The time periods provided for this effort include off-peak, AM peak and PM peak. Both peak periods cover a three hour period of the day, while the off-peak covers the remaining 18 hours of the day. The volumes and speeds provided were applied to each hour in the time period to determine the hourly speed distribution for the assessment.

Using EPA’s MOVES2010b model, emission quantities were projected for the “affected network”. As shown in **Table 8**, the following parameters were used for this portion of the study:

Table 8
Inputs to MOVES2010b for Regional MSAT Analysis

Inputs to MOVES2010b	
Parameter	Data
Evaluation Year(s)	2013/2020/2040
Evaluation Month	January/April/July/October
Days	Weekdays
Evaluation Hour	All 24
Sourcetype population	VDOT provided data
VMT	Developed by McCormick Taylor
Speed Distribution	Developed by McCormick Taylor
Road Type Distribution	Developed by McCormick Taylor
Ramp Fraction	Use Default
Month, Day VMT Fractions	VDOT provided data
Hour VMT Fractions	Developed by MT (based on AM/PM/Off peak data)

The following steps were used to quantify the potential MSAT emissions for each of the alternatives (e.g., the Build Alternative vs. the No-Build Alternative for each analysis year) related to the implementation of the project.

- Develop MOVES2010b modeling scenarios to calculate emission quantities for acrolein, benzene, 1,3-butadiene, diesel PM, formaldehyde, naphthalene and polycyclic organic matter for each of the four seasons.

- In the analysis, include roadway links in the “affected network” where the AADT is expected to change +/- 5% for the Build Alternative compared to the No-Build Alternative. The “affected network” can be seen in **Appendix D**.
- Calculate the MSAT emission quantities for each roadway link in the “affected network” for each of the four seasons analyzed.
- Average the four season emission quantities for each of the roadway links to identify a “typical day”.
- Calculate the annual predicted emission quantities by multiplying the daily estimates by 365 days per year.
- Consider mitigation if meaningful increases in MSAT emissions are identified.

The results of the quantitative MSAT analysis are summarized in **Table 9**. In general, the results show that MSAT emissions are expected to decline significantly from Existing (2013) Conditions to both the project Opening Year (2020) and Design Year Build (2040) conditions. More specifically, the results show that MSAT emissions would decline from 27.4% to 42.4% between 2013 and 2020 when comparing Existing to Build conditions. In addition, the results show that MSAT emissions would decline from 29.2% to 73.7% between 2013 and 2040 when comparing Existing to Build conditions. These reductions in MSAT emissions are projected to occur even though the vehicle miles traveled (VMT) are projected to increase approximately 68% between 2013 and 2020, and 115% for the Build Alternative considered between 2013 and 2040. The largest reductions between 2013 and 2040 are expected to occur in Diesel Particulate Matter where emissions are expected to decrease over 73%.

The results also indicate that the emissions of each of the MSAT are expected to decline from 8.3% to 13.2% when comparing the Opening Year (2020) Build condition to the Opening Year No-Build (2020) condition. Similarly, the results also indicate that the emissions of each of the MSAT are expected to decline from 8.1% to 16.7% when comparing the Design Year Build (2040) condition to the Design Year No-Build (2040) condition. In addition, VMT is expected to decrease within the project corridor between the Build and No Build conditions for both the 2020 and 2040 analysis years. This is expected to occur because the new C/D roads would allow drivers to take more direct routes between exits, as opposed to finding alternate routes that would take them on a less direct path. In addition, any decreases in VMT would also likely lead to decreases in MSAT emissions.

The results of the analysis are consistent with the national MSAT emission trends as predicted by MOVES2010b from 1999-2050 as shown in **Exhibit A**. The results of the analysis reflect advanced emission control technology and modern fuels, plus additional data for older technology vehicles. As discussed earlier, based on FHWA analysis using EPA’s MOVES2010b model, even if vehicle miles travelled (VMT) increases 102 percent as assumed from 2010 to 2050, a combined reduction of 83 percent in the total annual emissions for the priority MSAT is projected for the same time period. The results of the analysis show that no meaningful increases in MSAT are anticipated, and therefore the project is not expected to cause an adverse effect on the human environment as a result of the proposed improvements.

Although not possible under currently available methodologies to quantify public health

Table 9
Projected Annual Production of MSAT Pollutants on "Affected Network"
Short Tons per Year

		Vehicle Miles Traveled (VMT) (millions)*	Acrolein	Benzene	1,3-Butadiene	Diesel PM	Formaldehyde	Napthalene	Polycyclic Organic Matter
2013	Existing	2.02	0.22	2.69	0.48	18.77	3.27	0.34	78.74
2020	No-Build	3.56	0.15	2.02	0.36	14.49	2.60	0.28	61.90
	Build	3.39	0.13	1.86	0.33	12.70	2.26	0.25	55.76
	Build vs. Existing	67.7%	-42.4%	-31.0%	-31.3%	-32.3%	-30.9%	-27.4%	-29.2%
	Build vs. No-Build	-4.9%	-13.2%	-8.3%	-9.1%	-12.4%	-13.1%	-12.2%	-9.9%
2040	No-Build	4.55	0.11	2.07	0.36	5.62	2.50	0.25	57.82
	Build	4.34	0.09	1.90	0.32	4.95	2.09	0.21	51.98
	Build vs. Existing	114.8%	-59.0%	-29.2%	-32.0%	-73.7%	-36.1%	-38.5%	-34.0%
	Build vs. No-Build	-4.7%	-16.7%	-8.1%	-8.9%	-11.9%	-16.6%	-14.6%	-10.1%

* Daily vehicle miles traveled within the "affected network".

effects potentially attributable to changes in MSAT emission arising out of implementation of this project, it seems reasonable to assume that reductions in emissions over time would result in corollary reductions in health risks to exposed populations. For example, in its discussion of the new gasoline and vehicle standards issued in 2007 (referenced at the beginning of this section of this report), EPA estimates that implementation of the new standards would reduce both the number of people above the 1-in-100,000 cancer risk level, and the average population cancer risk, by reducing exposures to MSAT. EPA further concludes that the standards also would reduce the number of people with a respiratory hazard index (HI) greater than one by about 10 million in 2020, and 17 million in 2030 (a value of the HI greater than 1.0 can be best described as indicating that a potential may exist for adverse health effects, according to EPA).

MSAT analysis is a continuing area of research. While much work has been done to assess the overall health risks of MSAT, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how the potential health risks posed by MSAT exposure should be factored into project-level decision-making within the context of NEPA. Although it can be acknowledged that human populations could be exposed to MSAT under the Build Condition, with possible health-related consequences, those same populations would also be exposed to MSAT under Existing Conditions and under the No-Build Condition.

This analysis has considered current available information on MSAT, including regulatory requirements, modeling applications, and associated health effects. Based on the supplied information, the predicted reductions in MSAT emissions for Design Year (2040) Build Alternative when compared to Existing (2013) Conditions, the uncertainty regarding emissions estimates, and the difficulty of assessing exposure at the project level and associated health impacts, it does not appear that significant adverse impacts on air quality or human health from MSAT would be attributed to the proposed project.

The proposed project may have the effect of moving some traffic closer to nearby homes, athletic fields, and businesses; therefore, under the Build Alternative, there may be localized areas where ambient concentrations of MSAT could be higher than the No-Build Alternative. However, the magnitude and duration of these potential increases compared to the No-Build Alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. Regardless, even if localized increases do occur in some areas, total region-wide MSAT emissions will be substantially lower in future years due to fleet turnover and the implementation of EPA's vehicle and fuel regulations.

VIII. Construction Impacts

The temporary air quality impacts from construction are not expected to be significant. Emissions would be produced during the construction of this project by heavy equipment and vehicle travel to and from the site. Earth-moving and ground-disturbing operations would generate airborne dust. 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's *Road and Bridge Specifications*. These

Specifications require compliance with all applicable local, state, and federal air quality regulations.

The project lies in an area designated by the VDEQ as an emissions control area for volatile organic compounds (VOC) and nitrogen oxides (NO_x) (9VAC5-20-206). In addition, for work in this area, the following VDEQ air pollution regulations must be adhered to during the construction of this project: 9VAC 5-130-10, Regulation for Open Burning; and 9VAC5-50-60 Article 1, Standards of Performance for Visible Emissions and Fugitive Dust Emissions; and 9 VAC 5-45, Article 7, Emission Standards for Asphalt Paving Operations.

IX. Conformity Status of the Project

The project has also been evaluated with respect to regional air quality concerns. The final conformity regulations promulgated by the EPA in 1997, as part of 40 CFR Part 93, require that transportation plans and programs conform to the SIP. The final conformity rule requires that transportation plans in non-attainment and maintenance areas be consistent with the most recent estimates of mobile source emissions; provide for the expeditious implementation of transportation control measures in the applicable implementation plan; and contribute to annual emission reductions in non-attainment and maintenance areas.

Based on the CAAA and most recent EPA classifications, Stafford and Spotsylvania Counties and the City of Fredericksburg has been designated as a Maintenance Area for the 1997 8-hour ozone standard for which transportation conformity requirements were revoked as of July 20, 2013, and in attainment for all of the NAAQS; therefore, the project is not subject to transportation conformity requirements.

X. Conclusion

Based on the results of the CO hotspot analysis, worst-case CO concentrations for the Build Alternative are predicted to be well below the CO NAAQS in both the Interim/Opening Year Build (2020) and Design Year Build (2040) scenarios for each of the worst-case locations analyzed along the proposed project corridor, as well as for the worst-case signalized intersection evaluated in the analysis. Therefore, it is anticipated that all other locations within the project corridor would also remain below the CO NAAQS and no mitigation measures are required.

Additionally, the project lies in an area of the Commonwealth that has been designated as attainment with the fine particulate matter (PM_{2.5}) NAAQS, and therefore PM_{2.5} transportation conformity requirements do not apply. Similarly, MSAT emissions were evaluated and are expected to decrease significantly from current conditions to the Opening Year (2020) and Design Year (2040) conditions for the Build Alternative, even when considering the increase in vehicle miles traveled projected over those same time periods. The Opening Year (2020) and Design Year (2040) analyses for the Build Alternative also showed that the project is expected to reduce MSAT emissions when compared to the respective No-Build Alternative. Although there could be slight increases in MSAT levels in a few localized areas as a result of the proposed improvements, EPA's vehicle and fuel regulations will bring about significantly lower MSAT levels for the area in the future than exist today. The results of the analysis

indicate that no meaningful increases in MSAT have been identified and are not expected to cause an adverse effect on the human environment as a result of the proposed improvements.

Air quality impacts from construction are not expected to be significant. Construction activities are to be performed in accordance with VDOT's current *Road and Bridge Specifications*, as well as any local emission control regulations.

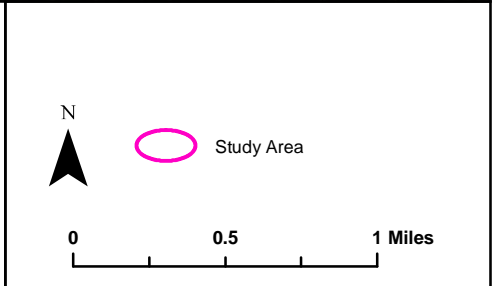
In conclusion, the project has been assessed for potential air quality impacts with all applicable air quality regulations and requirements. This assessment indicates that the project would meet all applicable air quality analysis requirements. As such, it has been demonstrated that the project would not cause or contribute to a violation of any NAAQS, increase the frequency or severity of any existing violation, or delay timely attainment of any applicable NAAQS.



AIR QUALITY FIGURES
I-95 RAPPAHANNOCK RIVER CROSSING



Figure 1
Study Area Map
I-95 Rappahannock River Crossing
 VDOT Project 0095-111-259, P101, UPC 101595
 Stafford and Spotsylvania Counties and the City of Fredericksburg, Virginia
 (Source: Esri & Digital Globe; 2013)



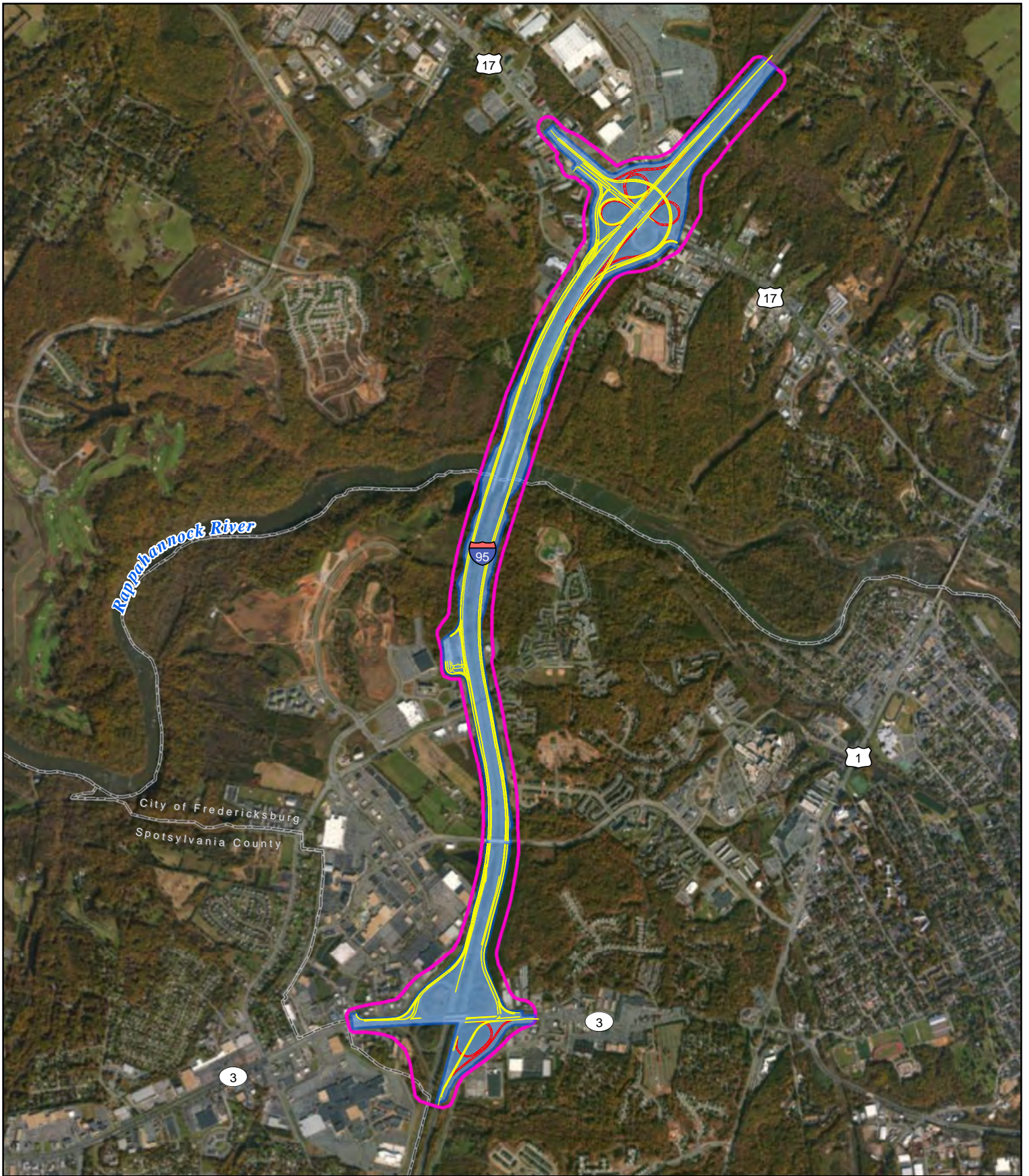


Figure 2
Proposed Build Alternative Map
I-95 Rappahannock River Crossing
 VDOT Project 0095-111-259, P101, UPC 101595
 Stafford and Spotsylvania Counties and the City of Fredericksburg, Virginia
 (Source: Esri & Digital Globe; 2013)

Study Area
 Potential Areas of Impact
 Proposed Build Alternative
 Proposed Demolition

N

0 0.25 0.5 Miles

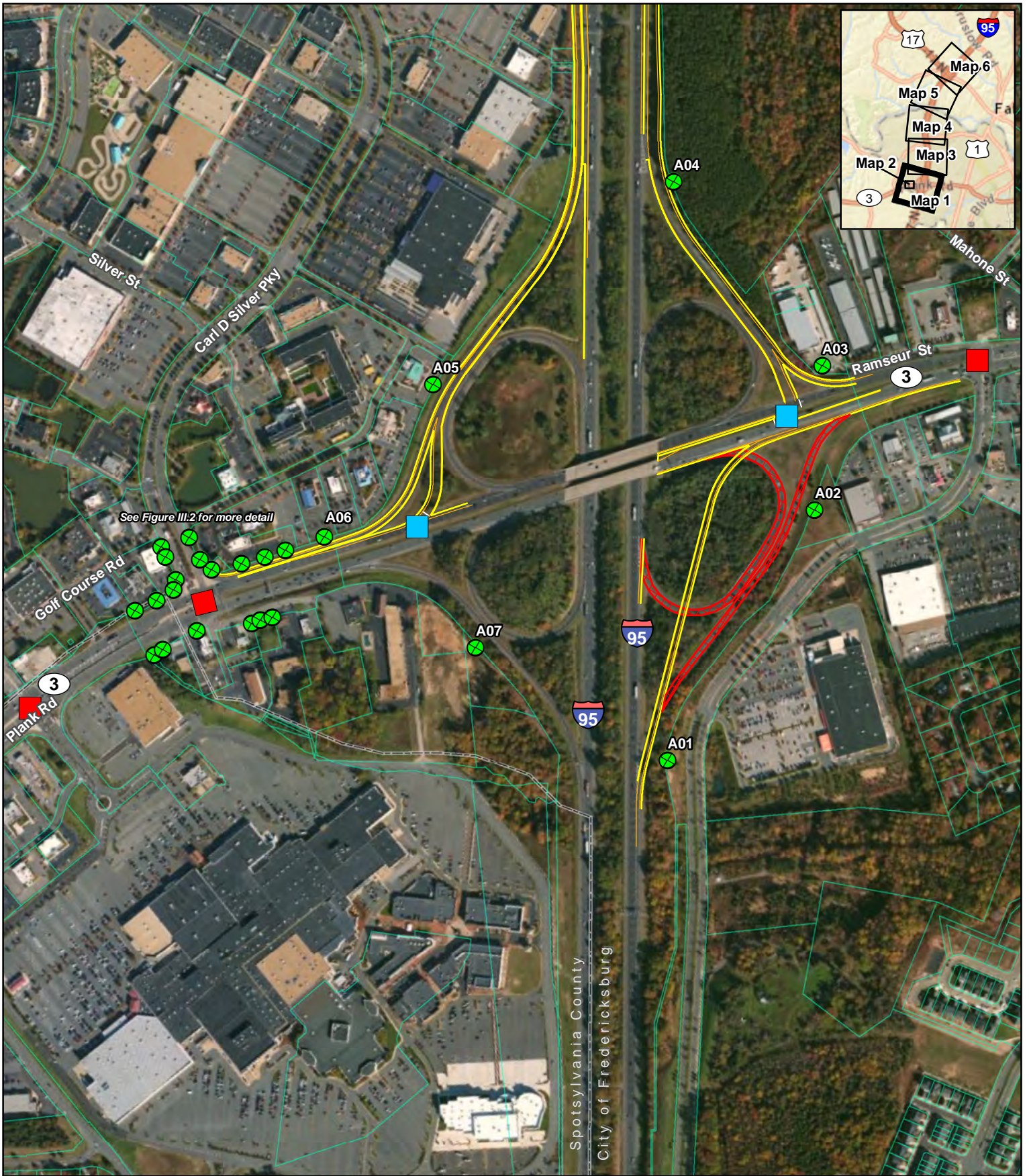


Figure 3-1

**Air Quality Modeling Receptor Map
I-95 Rappahannock River Crossing**

VDOT Project 0095-111-259, P101, UPC 101595

Stafford and Spotsylvania Counties and the City of Fredericksburg, Virginia
(Source: Esri & DigitalGlobe; 2013, FAMPO)

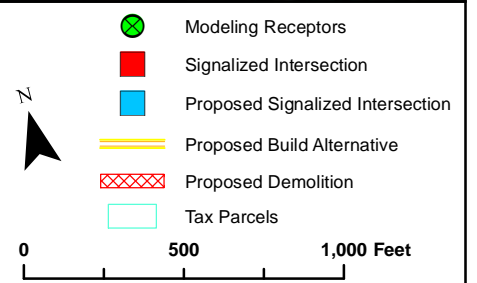
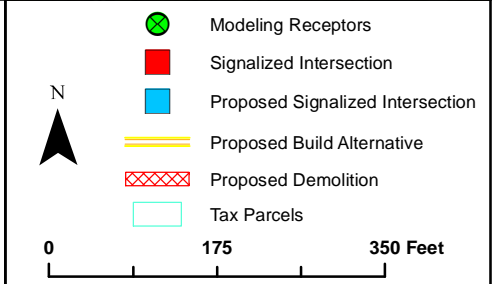




Figure 3-2
 Air Quality Modeling Receptor Map
 I-95 Rappahannock River Crossing
 VDOT Project 0095-111-259, P101, UPC 101595
 Stafford and Spotsylvania Counties and the City of Fredericksburg, Virginia
 (Source: Esri & DigitalGlobe; 2013, FAMPO)



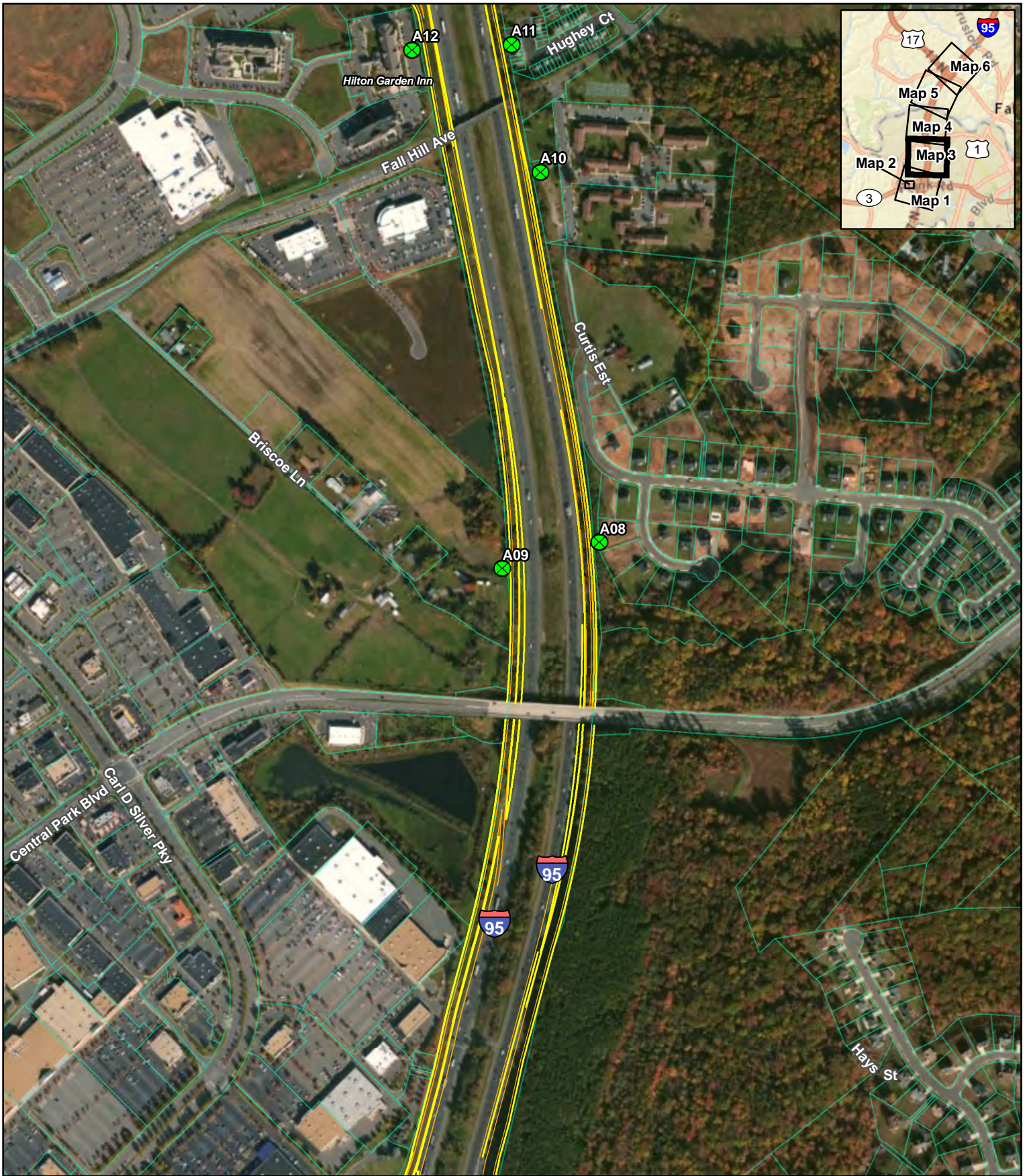


Figure 3-3
 Air Quality Modeling Receptor Map
 I-95 Rappahannock River Crossing
 VDOT Project 0095-111-259, P101, UPC 101595
 Stafford and Spotsylvania Counties and the City of Fredericksburg, Virginia
 (Source: Esri & DigitalGlobe; 2013, FAMPO)

	Modeling Receptors
	Signalized Intersection
	Proposed Signalized Intersection
	Proposed Build Alternative
	Proposed Demolition
	Tax Parcels

N

0 500 1,000 Feet

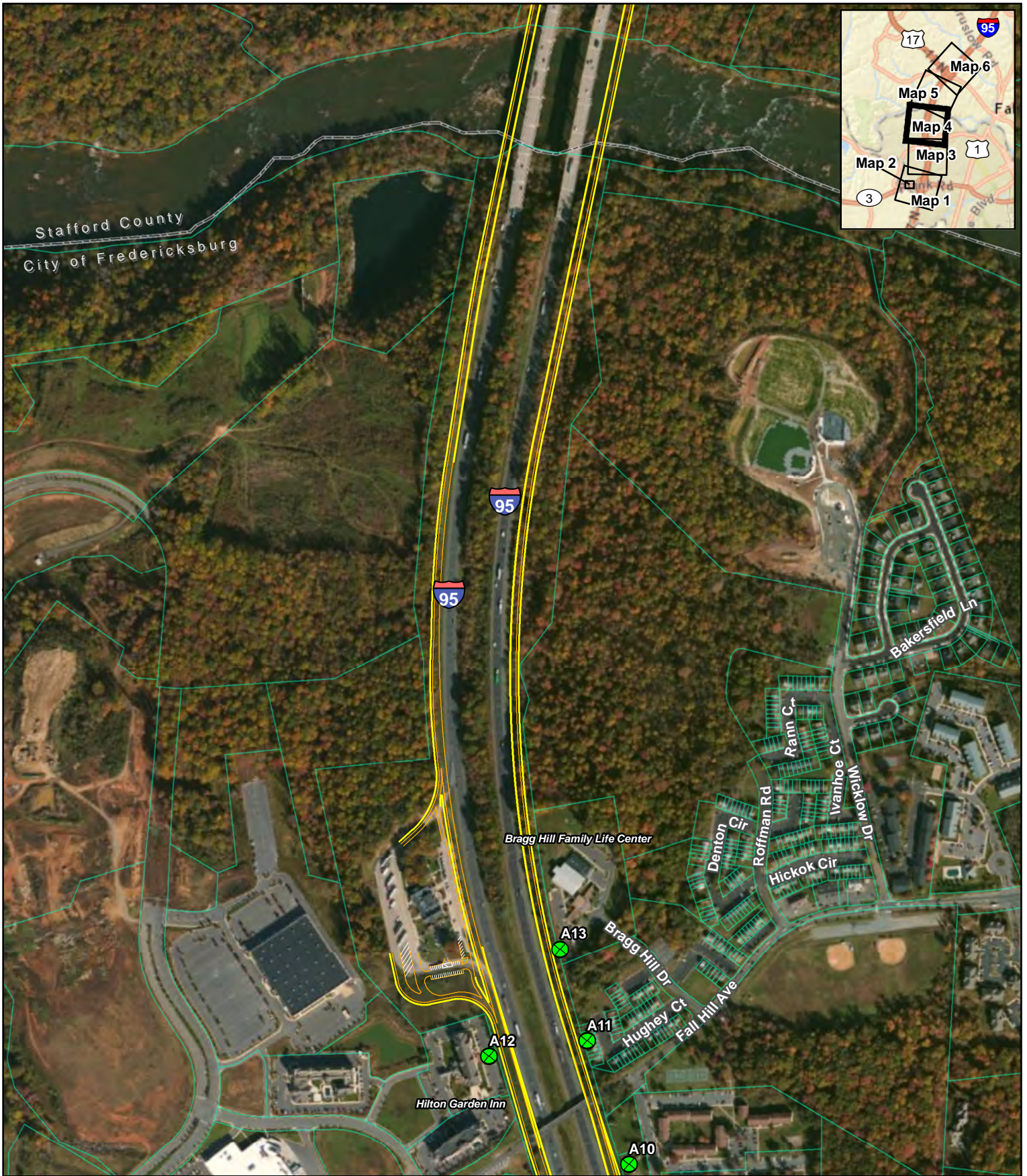


Figure 3-4
Air Quality Modeling Receptor Map
I-95 Rappahannock River Crossing

VDOT Project 0095-111-259, P101, UPC 101595

Stafford and Spotsylvania Counties and the City of Fredericksburg, Virginia
 (Source: Esri & DigitalGlobe; 2013, FAMPO)

	Modeling Receptors
	Signalized Intersection
	Proposed Signalized Intersection
	Proposed Build Alternative
	Proposed Demolition
	Tax Parcels

N

0 500 1,000 Feet

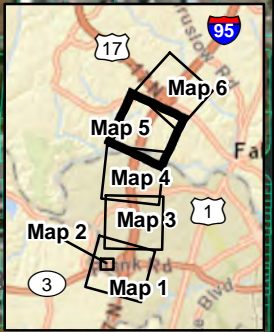
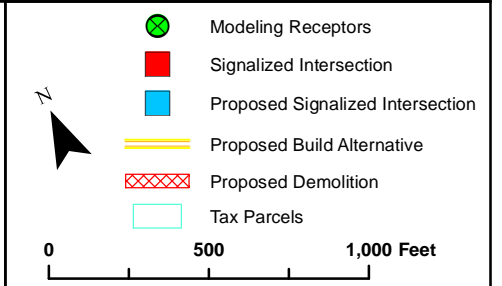


Figure 3-5
 Air Quality Modeling Receptor Map
 I-95 Rappahannock River Crossing
 VDOT Project 0095-111-259, P101, UPC 101595
 Stafford and Spotsylvania Counties and the City of Fredericksburg, Virginia
 (Source: Esri & DigitalGlobe; 2013, FAMPO)



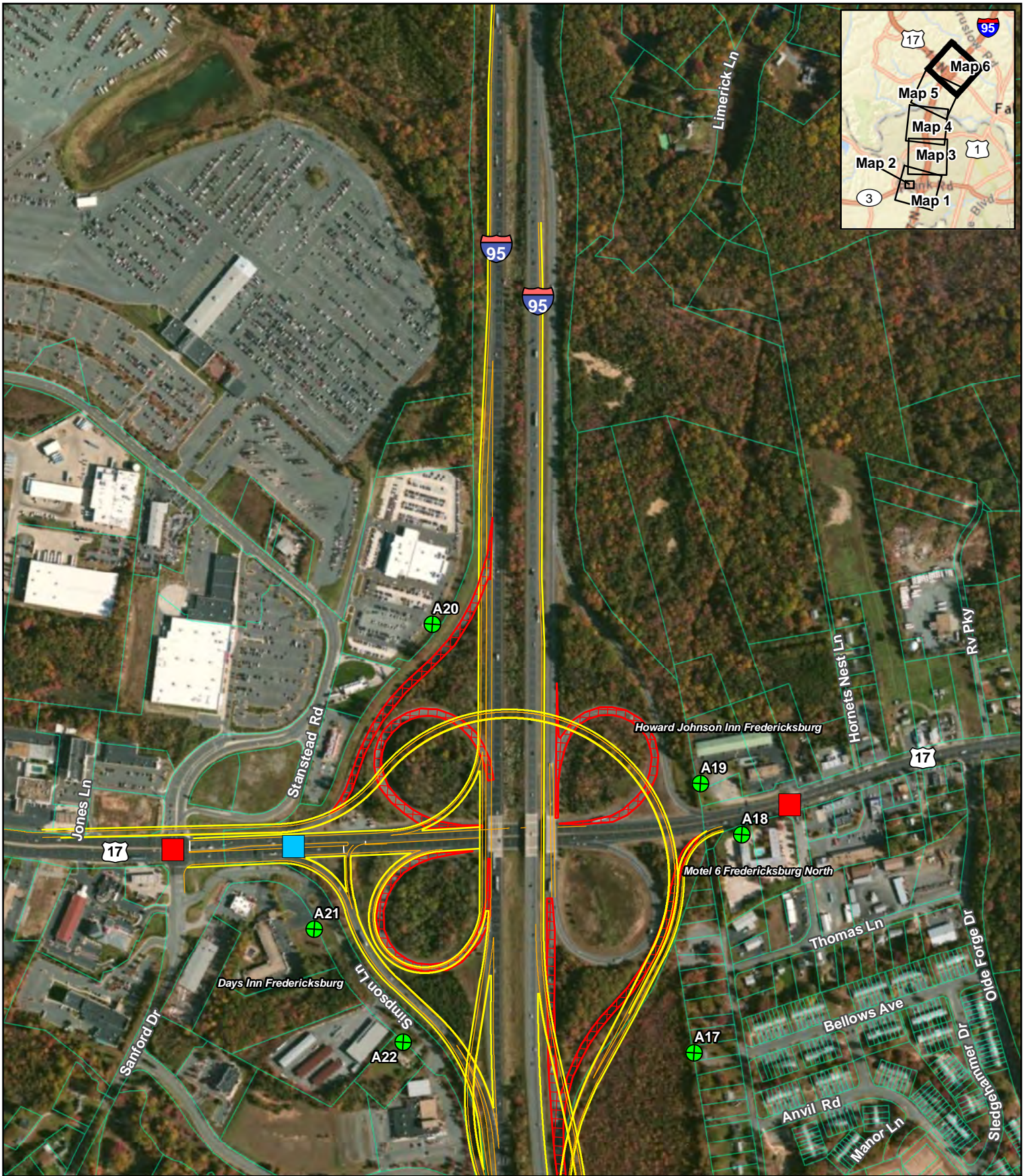
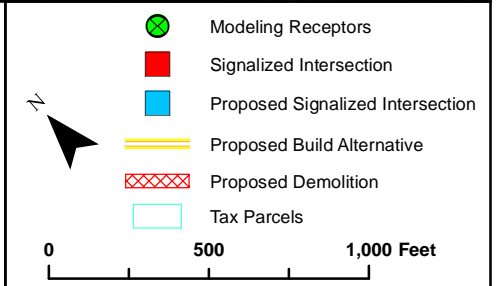


Figure 3-6
 Air Quality Modeling Receptor Map
 I-95 Rappahannock River Crossing
 VDOT Project 0095-111-259, P101, UPC 101595
 Stafford and Spotsylvania Counties and the City of Fredericksburg, Virginia
 (Source: Esri & DigitalGlobe; 2013, FAMPO)



APPENDIX A
SAMPLE MOVES2010B DATA

movesRun	yearId	monthId	dayId	hourId	linkId	pollutant	GramsPerVehMile	GramsPerVehHour
3	2013	1	5	18	1	CO	2.62545135	
3	2013	1	5	18	2	CO	4.312938921	
3	2013	1	5	18	3	CO	4.352691832	
3	2013	1	5	18	4	CO	5.110116747	
3	2013	1	5	18	5	CO	4.211100224	
3	2013	1	5	18	6	CO	4.537604278	
3	2013	1	5	18	7	CO	5.935242155	
3	2013	1	5	18	8	CO	4.642317062	
3	2013	1	5	18	9	CO	3.02137445	
3	2013	1	5	18	10	CO	3.672419433	
3	2013	1	5	18	11	CO	3.672415677	
3	2013	1	5	18	12	CO	4.525259076	
3	2013	1	5	18	13	CO	2.32112692	
4	2013	1	5	18	14	CO	2.273545493	
4	2013	1	5	18	15	CO	4.519124961	
4	2013	1	5	18	16	CO	3.711027201	
4	2013	1	5	18	17	CO	3.113169312	
4	2013	1	5	18	18	CO	3.294020689	
4	2013	1	5	18	19	CO	3.860773427	
4	2013	1	5	18	20	CO	2.767277196	
4	2013	1	5	18	21	CO	2.616082701	
4	2013	1	5	18	22	CO	1.468007279	
4	2013	1	5	18	23	CO	3.341061069	
4	2013	1	5	18	24	CO	3.409245	
4	2013	1	5	18	25	CO	1.870165952	
4	2013	1	5	18	26	CO	2.365961445	
4	2013	1	5	18	27	CO	2.210261303	
4	2013	1	5	18	28	CO	4.072428763	
4	2013	1	5	18	29	CO	1.512717967	
4	2013	1	5	18	30	CO	2.273547879	
4	2013	1	5	18	31	CO	4.317612806	
4	2013	1	5	18	32	CO	4.37765531	
4	2013	1	5	18	33	CO	2.722939089	
4	2013	1	5	18	34	CO	4.368891145	
4	2013	1	5	18	35	CO	3.680193483	
4	2013	1	5	18	36	CO	2.273550773	
4	2013	1	5	18	37	CO	2.682035161	
4	2013	1	5	18	38	CO	3.56071804	
4	2013	1	5	18	39	CO	2.767267154	
4	2013	1	5	18	40	CO	1.868231862	
4	2013	1	5	18	41	CO	1.519554359	
4	2013	1	5	18	42	CO	2.273551326	
3	2013	1	5	18	43	CO	7.004314725	
3	2013	1	5	18	44	CO	3.142043211	
3	2013	1	5	18	45	CO	3.672418362	
3	2013	1	5	18	46	CO	4.968534061	
3	2013	1	5	18	47	CO	3.672423391	
3	2013	1	5	18	48	CO	2.98077567	
3	2013	1	5	18	49	CO	2.904635311	
3	2013	1	5	18	50	CO	3.222513651	
4	2013	1	5	18	51	CO	6.084170382	
3	2013	1	5	18	52	CO	4.081995655	
3	2013	1	5	18	53	CO	4.463092102	
3	2013	1	5	18	54	CO	4.211864644	
3	2013	1	5	18	55	CO	6.430213006	
3	2013	1	5	18	56	CO	3.654156201	
4	2013	1	5	18	57	CO	3.880664556	
4	2013	1	5	18	58	CO		26.83161176
3	2013	1	5	18	59	CO		25.81122279
4	2013	1	5	18	60	CO		26.83159183
3	2013	1	5	18	61	CO		25.81126279
3	2013	1	5	18	62	CO		25.81127766
3	2013	1	5	18	63	CO	6.326584463	
3	2013	1	5	18	64	CO	4.714199409	

3	2013	1	5	18	65 CO	3.937225358	
3	2013	1	5	18	66 CO	3.93721503	
3	2013	1	5	18	67 CO	3.937220129	
3	2013	1	5	18	68 CO	3.937222733	
3	2013	1	5	18	69 CO	3.419502924	
3	2013	1	5	18	70 CO		25.8112605
3	2013	1	5	18	71 CO	3.937215028	
3	2013	1	5	18	72 CO		25.81127314
4	2013	1	5	18	73 CO	6.662319419	
3	2013	1	5	18	74 CO		25.81125932
3	2013	1	5	18	75 CO	7.504046687	
3	2013	1	5	18	76 CO	7.504030518	
3	2013	1	5	18	77 CO	4.276107443	
3	2013	1	5	18	78 CO	6.123256821	
3	2013	1	5	18	79 CO		25.81125865
4	2013	1	5	18	80 CO	2.035161996	
4	2013	1	5	18	81 CO	2.895317352	
4	2013	1	5	18	82 CO	2.481196573	
4	2013	1	5	18	83 CO	2.747591427	
4	2013	1	5	18	84 CO	2.299145293	
4	2013	1	5	18	85 CO	2.69389359	
4	2013	1	5	18	86 CO	2.481194918	
4	2013	1	5	18	87 CO	2.481183006	
4	2013	1	5	18	88 CO	2.188653166	
4	2013	1	5	18	89 CO	3.427772663	
3	2013	1	5	18	90 CO		25.81129686
3	2013	1	5	18	91 CO		25.81127766
3	2013	1	5	18	92 CO	3.609967995	
3	2013	1	5	18	93 CO		25.81125088
3	2013	1	5	18	94 CO		25.81125909
4	2013	1	5	18	95 CO		26.83160223
3	2013	1	5	18	96 CO	6.155352116	
4	2013	1	5	18	97 CO	3.942287335	
4	2013	1	5	18	98 CO	3.454495454	
3	2013	1	5	18	99 CO	3.672427507	
3	2013	1	5	18	100 CO	3.672429623	
3	2013	1	5	18	101 CO	7.504021842	

movesRun	yearId	monthId	dayId	hourId	linkId	pollutant	GramsPerV	GramsPerVehHour
2	2020	1	5	18	11	CO	1.593375	
2	2020	1	5	18	12	CO	3.132812	
2	2020	1	5	18	13	CO	2.68232	
2	2020	1	5	18	14	CO	1.929644	
2	2020	1	5	18	15	CO	1.023025	
2	2020	1	5	18	16	CO	2.341108	
2	2020	1	5	18	17	CO	2.388037	
2	2020	1	5	18	18	CO	1.291348	
2	2020	1	5	18	19	CO	1.634821	
2	2020	1	5	18	20	CO	1.522856	
2	2020	1	5	18	21	CO	2.831797	
2	2020	1	5	18	22	CO	1.05401	
2	2020	1	5	18	23	CO	1.593375	
2	2020	1	5	18	24	CO	2.99527	
2	2020	1	5	18	25	CO	3.031818	
2	2020	1	5	18	26	CO	1.593377	
2	2020	1	5	18	27	CO	2.443389	
2	2020	1	5	18	28	CO	1.593378	
2	2020	1	5	18	29	CO	1.303064	
2	2020	1	5	18	30	CO	1.059008	
2	2020	1	5	18	31	CO	1.593373	
2	2020	1	5	18	68	CO	1.424366	
2	2020	1	5	18	69	CO	2.04426	
2	2020	1	5	18	70	CO	1.745608	
2	2020	1	5	18	71	CO	1.938081	
2	2020	1	5	18	72	CO	1.616592	
2	2020	1	5	18	73	CO	1.900096	
2	2020	1	5	18	74	CO	1.7456	
2	2020	1	5	18	75	CO	1.745608	
2	2020	1	5	18	76	CO	1.537434	
2	2020	1	5	18	77	CO	2.428874	
2	2020	1	5	18	99	CO	1.593375	
2	2020	1	5	18	100	CO	3.44865	
2	2020	1	5	18	101	CO	3.190171	
2	2020	1	5	18	102	CO	1.44186	
2	2020	1	5	18	103	CO	2.603596	
2	2020	1	5	18	104	CO	2.277002	
2	2020	1	5	18	105	CO	1.403049	
2	2020	1	5	18	106	CO	2.059181	
2	2020	1	5	18	107	CO	3.042736	
2	2020	1	5	18	108	CO	1.756204	
2	2020	1	5	18	109	CO	0.982028	
2	2020	1	5	18	110	CO	0.908151	
2	2020	1	5	18	111	CO	1.433149	
2	2020	1	5	18	112	CO	1.07557	
2	2020	1	5	18	117	CO	1.254516	
2	2020	1	5	18	118	CO	2.021715	
2	2020	1	5	18	119	CO	1.334427	
2	2020	1	5	18	120	CO	2.995278	
2	2020	1	5	18	121	CO	1.803624	
2	2020	1	5	18	122	CO	2.489831	
2	2020	1	5	18	128	CO	3.132826	
2	2020	1	5	18	129	CO	1.537441	
2	2020	1	5	18	130	CO	1.593381	
2	2020	1	5	18	131	CO	2.443384	
1	2020	1	5	18	1	CO	1.795873	
1	2020	1	5	18	2	CO	3.000052	
1	2020	1	5	18	3	CO	3.161469	
1	2020	1	5	18	4	CO	4.119185	
1	2020	1	5	18	5	CO	2.896959	
1	2020	1	5	18	6	CO	2.07726	
1	2020	1	5	18	7	CO	2.544255	
1	2020	1	5	18	8	CO	2.544265	
1	2020	1	5	18	9	CO	3.152498	

1	2020	1	5	18	10 CO	1.59124	
1	2020	1	5	18	32 CO	4.847388	
1	2020	1	5	18	33 CO	2.16252	
1	2020	1	5	18	34 CO	2.544258	
1	2020	1	5	18	35 CO	3.465996	
1	2020	1	5	18	36 CO	2.544256	
1	2020	1	5	18	37 CO	2.048659	
1	2020	1	5	18	38 CO	1.99605	
1	2020	1	5	18	39 CO	2.220676	
1	2020	1	5	18	41 CO	3.099717	
1	2020	1	5	18	42 CO	2.880351	
1	2020	1	5	18	43 CO	4.469228	
1	2020	1	5	18	44 CO	2.501086	
1	2020	1	5	18	47 CO		9.346766
1	2020	1	5	18	49 CO		9.346763
1	2020	1	5	18	50 CO		9.346763
1	2020	1	5	18	51 CO	3.926222	
1	2020	1	5	18	52 CO	3.309094	
1	2020	1	5	18	53 CO	2.747191	
1	2020	1	5	18	54 CO	2.747195	
1	2020	1	5	18	55 CO	2.747189	
1	2020	1	5	18	56 CO	2.747179	
1	2020	1	5	18	57 CO	2.378853	
1	2020	1	5	18	58 CO		9.346771
1	2020	1	5	18	59 CO	2.747188	
1	2020	1	5	18	60 CO		9.346761
1	2020	1	5	18	62 CO		9.346762
1	2020	1	5	18	63 CO	5.124307	
1	2020	1	5	18	64 CO	5.124287	
1	2020	1	5	18	65 CO	2.920769	
1	2020	1	5	18	66 CO	4.287418	
1	2020	1	5	18	67 CO		9.346787
1	2020	1	5	18	78 CO		9.346769
1	2020	1	5	18	79 CO		9.346766
1	2020	1	5	18	80 CO	2.5146	
1	2020	1	5	18	81 CO		9.346754
1	2020	1	5	18	82 CO		9.346763
1	2020	1	5	18	84 CO	4.296443	
1	2020	1	5	18	87 CO	2.693264	
1	2020	1	5	18	88 CO	2.693259	
1	2020	1	5	18	89 CO	5.124289	
1	2020	1	5	18	90 CO	2.321191	
1	2020	1	5	18	91 CO	3.383812	
1	2020	1	5	18	92 CO	3.594295	
1	2020	1	5	18	93 CO	2.082531	
1	2020	1	5	18	94 CO	2.15291	
1	2020	1	5	18	95 CO	3.226033	
1	2020	1	5	18	96 CO	2.091847	
1	2020	1	5	18	97 CO	3.500934	
1	2020	1	5	18	98 CO	1.395572	
1	2020	1	5	18	113 CO	5.126828	
1	2020	1	5	18	114 CO	3.313867	
1	2020	1	5	18	115 CO	3.000035	
1	2020	1	5	18	116 CO	2.896959	
1	2020	1	5	18	123 CO	2.241594	
1	2020	1	5	18	124 CO	3.476206	
1	2020	1	5	18	125 CO	2.789937	
1	2020	1	5	18	126 CO	2.713908	
1	2020	1	5	18	127 CO	2.331346	
1	2020	1	5	18	40 CO	4.206175	
1	2020	1	5	18	45 CO	2.695539	
1	2020	1	5	18	46 CO		10.15468
1	2020	1	5	18	48 CO		10.1547
1	2020	1	5	18	61 CO	4.631642	
1	2020	1	5	18	83 CO		10.15465

1	2020	1	5	18	85 CO	2.691872
1	2020	1	5	18	86 CO	2.375406

movesRun	yearId	monthId	dayId	hourId	linkId	pollutant	GramsPerV	GramsPerVehHour
1	2040	1	5	18	40	CO	3.420813	
1	2040	1	5	18	45	CO	2.183371	
1	2040	1	5	18	46	CO		4.643086
1	2040	1	5	18	48	CO		4.643093
1	2040	1	5	18	61	CO	3.725477	
1	2040	1	5	18	83	CO		4.643077
1	2040	1	5	18	85	CO	2.13662	
1	2040	1	5	18	86	CO	1.919646	
1	2040	1	5	18	91	CO	3.420817	
1	2040	1	5	18	11	CO	1.338906	
1	2040	1	5	18	12	CO	2.623369	
1	2040	1	5	18	13	CO	2.207929	
1	2040	1	5	18	14	CO	1.602496	
1	2040	1	5	18	15	CO	0.847704	
1	2040	1	5	18	16	CO	1.970116	
1	2040	1	5	18	17	CO	2.009614	
1	2040	1	5	18	18	CO	1.06517	
1	2040	1	5	18	19	CO	1.349185	
1	2040	1	5	18	20	CO	1.253914	
1	2040	1	5	18	21	CO	2.374281	
1	2040	1	5	18	22	CO	0.874277	
1	2040	1	5	18	23	CO	1.338905	
1	2040	1	5	18	24	CO	2.508363	
1	2040	1	5	18	25	CO	2.539999	
1	2040	1	5	18	26	CO	1.338906	
1	2040	1	5	18	27	CO	2.082553	
1	2040	1	5	18	28	CO	1.602496	
1	2040	1	5	18	29	CO	1.089576	
1	2040	1	5	18	30	CO	0.878699	
1	2040	1	5	18	31	CO	1.338902	
1	2040	1	5	18	68	CO	1.189787	
1	2040	1	5	18	69	CO	1.722063	
1	2040	1	5	18	70	CO	1.465124	
1	2040	1	5	18	71	CO	1.630562	
1	2040	1	5	18	72	CO	1.355771	
1	2040	1	5	18	73	CO	1.598443	
1	2040	1	5	18	74	CO	1.465123	
1	2040	1	5	18	75	CO	1.465124	
1	2040	1	5	18	76	CO	1.288447	
1	2040	1	5	18	77	CO	2.053507	
1	2040	1	5	18	90	CO	2.540014	
1	2040	1	5	18	101	CO	0.878702	
1	2040	1	5	18	102	CO	1.089575	
1	2040	1	5	18	103	CO	1.338904	
1	2040	1	5	18	104	CO	2.508353	
1	2040	1	5	18	105	CO	1.3389	
1	2040	1	5	18	106	CO	0.874279	
1	2040	1	5	18	107	CO	1.338907	
1	2040	1	5	18	117	CO	1.33891	
1	2040	1	5	18	118	CO	2.884037	
1	2040	1	5	18	119	CO	2.62284	
1	2040	1	5	18	120	CO	1.209376	
1	2040	1	5	18	121	CO	2.340127	
1	2040	1	5	18	122	CO	1.882217	
1	2040	1	5	18	123	CO	1.179738	
1	2040	1	5	18	124	CO	1.746385	
1	2040	1	5	18	125	CO	2.720862	
1	2040	1	5	18	126	CO	1.433782	
1	2040	1	5	18	127	CO	0.933539	
1	2040	1	5	18	128	CO	0.753783	
1	2040	1	5	18	129	CO	1.459771	
1	2040	1	5	18	130	CO	0.892634	
1	2040	1	5	18	135	CO	0.98465	
1	2040	1	5	18	136	CO	1.801225	

1	2040	1	5	18	137 CO	1.118905	
1	2040	1	5	18	138 CO	2.508355	
1	2040	1	5	18	139 CO	1.688831	
1	2040	1	5	18	140 CO	2.071207	
1	2040	1	5	18	146 CO	2.623366	
1	2040	1	5	18	147 CO	1.28845	
1	2040	1	5	18	148 CO	1.602495	
1	2040	1	5	18	149 CO	2.08256	
1	2040	1	5	18	1 CO	1.486111	
1	2040	1	5	18	2 CO	2.535191	
1	2040	1	5	18	3 CO	2.677461	
1	2040	1	5	18	4 CO	3.404118	
1	2040	1	5	18	5 CO	2.447527	
1	2040	1	5	18	6 CO	1.731402	
1	2040	1	5	18	7 CO	2.13897	
1	2040	1	5	18	8 CO	2.138959	
1	2040	1	5	18	9 CO	2.669481	
1	2040	1	5	18	10 CO	1.313343	
1	2040	1	5	18	32 CO	4.115907	
1	2040	1	5	18	33 CO	1.805474	
1	2040	1	5	18	34 CO	2.13895	
1	2040	1	5	18	35 CO	2.941274	
1	2040	1	5	18	36 CO	2.138951	
1	2040	1	5	18	37 CO	1.706796	
1	2040	1	5	18	38 CO	1.661516	
1	2040	1	5	18	39 CO	1.856122	
1	2040	1	5	18	41 CO	2.576189	
1	2040	1	5	18	42 CO	2.348388	
1	2040	1	5	18	43 CO	3.700142	
1	2040	1	5	18	44 CO	2.053999	
1	2040	1	5	18	47 CO		4.538049
1	2040	1	5	18	49 CO		4.538044
1	2040	1	5	18	50 CO		4.538044
1	2040	1	5	18	51 CO	3.687061	
1	2040	1	5	18	52 CO	2.794886	
1	2040	1	5	18	53 CO	2.30306	
1	2040	1	5	18	54 CO	2.303059	
1	2040	1	5	18	55 CO	2.30306	
1	2040	1	5	18	56 CO	2.303058	
1	2040	1	5	18	57 CO	1.986238	
1	2040	1	5	18	58 CO		4.538054
1	2040	1	5	18	59 CO	2.303064	
1	2040	1	5	18	60 CO		4.538045
1	2040	1	5	18	62 CO		4.538053
1	2040	1	5	18	63 CO	4.231028	
1	2040	1	5	18	64 CO	4.231031	
1	2040	1	5	18	65 CO	2.401866	
1	2040	1	5	18	66 CO	3.583013	
1	2040	1	5	18	67 CO		4.538066
1	2040	1	5	18	78 CO		4.53805
1	2040	1	5	18	79 CO		4.538049
1	2040	1	5	18	80 CO	2.103088	
1	2040	1	5	18	81 CO		4.538062
1	2040	1	5	18	82 CO		4.538047
1	2040	1	5	18	84 CO	3.581814	
1	2040	1	5	18	87 CO	2.138954	
1	2040	1	5	18	88 CO	2.13896	
1	2040	1	5	18	89 CO	3.539013	
1	2040	1	5	18	92 CO	1.856131	
1	2040	1	5	18	93 CO	1.661515	
1	2040	1	5	18	94 CO	1.697273	
1	2040	1	5	18	95 CO	2.138953	
1	2040	1	5	18	96 CO	2.941268	
1	2040	1	5	18	97 CO	2.138963	
1	2040	1	5	18	98 CO	1.805473	

1	2040	1	5	18	99 CO	4.11592
1	2040	1	5	18	100 CO	2.138965
1	2040	1	5	18	108 CO	1.849884
1	2040	1	5	18	109 CO	2.822836
1	2040	1	5	18	110 CO	3.056855
1	2040	1	5	18	111 CO	1.847593
1	2040	1	5	18	112 CO	1.764464
1	2040	1	5	18	113 CO	2.68364
1	2040	1	5	18	114 CO	1.743489
1	2040	1	5	18	115 CO	2.971438
1	2040	1	5	18	116 CO	1.148888
1	2040	1	5	18	131 CO	4.353251
1	2040	1	5	18	132 CO	2.928996
1	2040	1	5	18	133 CO	2.535186
1	2040	1	5	18	134 CO	2.447527
1	2040	1	5	18	141 CO	1.874347
1	2040	1	5	18	142 CO	2.949886
1	2040	1	5	18	143 CO	2.354488
1	2040	1	5	18	144 CO	2.303057
1	2040	1	5	18	145 CO	1.986241



APPENDIX B
SAMPLE CAL3QHC INPUT / OUTPUT FILES

1 2013 exsiting intersection
 CAL3QHC - (DATED 95221)

CAL3QHC PC (32 BIT) VERSION 3.0.0
 (C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

Run Began on 7/22/2014 at 10:28:57

JOB:

RUN:

DATE : 07/22/ 0
 TIME : 10:28:57

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 175. CM
 U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 2.9 PPM

LINK VARIABLES

H	W	LINK DESCRIPTION V/C QUEUE	*	LINK COORDINATES (M)				*	LENGTH	BRG TYPE	VPH	EF
(M)	(M)	(VEH)	*	X1	Y1	X2	Y2	*	(M)	(DEG)		(G/MI)
0.0	3.7	1. EB RIGHT QUE 0.01 0.3	*	804999.5	*****	804998.0	*****	*	2.	260. AG	35.	100.0
0.0	11.0	2. EB THRU QUE 2.23 559.6	*	804999.5	*****	801726.6	*****	*	3358.	257. AG	35.	100.0
0.0	7.3	3. EB LEFT QUE 0.38 4.9	*	804996.2	*****	804967.1	*****	*	30.	258. AG	111.	100.0
0.0	3.7	4. NB LEFT QUE 0.22 0.9	*	805015.3	*****	805016.0	*****	*	5.	173. AG	64.	100.0
0.0	3.7	5. NB RIGHT QUE 0.38 1.6	*	805019.2	*****	805020.3	*****	*	9.	173. AG	64.	100.0
0.0	7.3	6. WB LEFT QUE 0.18 0.8	*	805035.3	*****	805040.0	*****	*	5.	90. AG	127.	100.0
0.0	11.0	7. WB THRU QUE 0.94 27.9	*	805033.3	*****	805199.8	*****	*	167.	84. AG	132.	100.0
0.0	7.3	8. WB RIGHT QUE 0.85 14.0	*	805025.1	*****	805090.9	*****	*	84.	128. AG	88.	100.0
0.0	7.3	9. WB RIGHT QUE 0.85 14.0	*	805035.2	*****	805118.0	*****	*	84.	100. AG	88.	100.0
0.0	7.3	10. WB RIGHT QUE	*	805057.9	*****	805141.7	*****	*	84.	86. AG	88.	100.0

2013 existing intersection

0.0	7.3	0.85	14.0										
	11.	SB LEFT QUE		*	805002.1	*****	804957.2	*****	*	235.	349.	AG	106. 100.0
0.0	7.3	1.11	39.2										
	12.	SB TRHU QUE		*	804998.1	*****	804997.5	*****	*	3.	347.	AG	53. 100.0
0.0	3.7	0.03	0.5										
	13.	SB RIGHT QUE		*	804977.3	*****	805023.4	*****	*	69.	42.	AG	53. 100.0
0.0	3.7	0.89	11.5										
	14.	SB RIGHT QUE		*	804986.3	*****	804999.2	*****	*	69.	11.	AG	53. 100.0
0.0	3.7	0.89	11.5										
	15.	SB RIGHT QUE		*	804988.9	*****	804977.7	*****	*	69.	351.	AG	53. 100.0
0.0	3.7	0.89	11.5										
	16.	EB FREE APP		*	804767.0	*****	804887.6	*****	*	129.	70.	AG	2123. 3.9
0.0	20.7												
	17.	EB FREE APP		*	804887.6	*****	805017.3	*****	*	133.	76.	AG	2123. 3.9
0.0	20.7												
	18.	EB FREE DEC		*	805017.6	*****	805193.2	*****	*	176.	84.	AG	2713. 6.3
0.0	20.7												
	19.	WB FREE APP		*	805175.3	*****	805011.3	*****	*	165.	264.	AG	2752. 3.9
0.0	20.7												
	20.	WB FREE DEC		*	805010.7	*****	804939.9	*****	*	72.	259.	AG	3039. 6.7
0.0	20.7												
	21.	WB FREE DEC		*	804939.9	*****	804881.2	*****	*	61.	255.	AG	3039. 6.7
0.0	20.7												
	22.	WB FREE DEC		*	804881.2	*****	804756.4	*****	*	133.	249.	AG	3039. 6.7
0.0	20.7												
	23.	RAMP		*	805025.4	*****	805015.6	*****	*	18.	327.	AG	935. 7.5
0.0	9.8												
	24.	RAMP		*	805015.6	*****	805010.0	*****	*	22.	345.	AG	935. 7.5
0.0	9.8												
	25.	NB FREE DEC		*	805020.9	*****	805006.1	*****	*	75.	349.	AG	283. 7.5
0.0	17.1												
	26.	NB DEC		*	805007.9	*****	804995.3	*****	*	67.	349.	AG	1218. 4.3
0.0	17.1												
	27.	NB DEC		*	804995.3	*****	804970.8	*****	*	157.	351.	AG	1218. 4.3
0.0	17.1												
	28.	SB FREE APP		*	804949.5	*****	805003.0	*****	*	298.	170.	AG	861. 6.1
0.0	17.1												
	29.	3 EB TO 95 SB ONRAMP*		*	805181.4	*****	805239.2	*****	*	58.	82.	AG	630. 3.7
0.0	9.8												
	30.	3 EB TO 95 SB ONRAMP*		*	805239.2	*****	805285.3	*****	*	48.	105.	AG	630. 3.7
0.0	9.8												
	31.	3 EB TO 95 SB ONRAMP*		*	805285.3	*****	805334.5	*****	*	56.	119.	AG	630. 3.7
0.0	9.8												
	32.	3 EB TO 95 SB ONRAMP*		*	805334.5	*****	805373.0	*****	*	57.	137.	AG	630. 3.7
0.0	9.8												
	33.	3 EB TO 95 SB ONRAMP*		*	805373.0	*****	805424.4	*****	*	114.	153.	AG	630. 3.7
0.0	9.8												
	34.	3 EB TO 95 SB ONRAMP*		*	805424.4	*****	805464.0	*****	*	81.	151.	AG	630. 3.7

2013 existing intersection

0.0	9.8	35.	3 EB TO 95 SB ONRAMP*	805464.0	*****	805479.0	*****	*	60.	165.	AG	630.	3.7
0.0	9.8	36.	3 EB TO 95 SB ONRAMP*	805479.0	*****	805467.2	*****	*	107.	186.	AG	630.	3.7
0.0	9.8	37.	EB ROUTE 3	* 805192.1	*****	805545.4	*****	*	354.	85.	AG	2083.	4.7
0.0	17.1	38.	WB ROUTE 3	* 805531.5	*****	805175.0	*****	*	358.	265.	AG	3687.	3.4
0.0	17.1	39.	95 SB TO 3 WB OFFRAM*	805454.4	*****	805418.0	*****	*	52.	224.	AG	2250.	4.5
0.0	13.4	40.	95 SB TO 3 WB OFFRAM*	805418.0	*****	805390.2	*****	*	44.	220.	AG	2250.	4.5
0.0	13.4	41.	95 SB TO 3 WB OFFRAM*	805390.2	*****	805333.4	*****	*	108.	212.	AG	2250.	4.5
0.0	13.4	42.	95 SB TO 3 WB OFFRAM*	805333.4	*****	805308.8	*****	*	33.	229.	AG	2250.	4.5
0.0	13.4	43.	95 SB TO 3 WB OFFRAM*	805308.8	*****	805258.5	*****	*	55.	247.	AG	2250.	4.5
0.0	13.4	44.	95 SB TO 3 WB OFFRAM*	805258.5	*****	805241.4	*****	*	17.	262.	AG	2250.	4.5

♀

PAGE 2

JOB:

RUN:

DATE : 07/22/ 0

TIME : 10:28:57

LINK VARIABLES

LINK DESCRIPTION		*	LINK COORDINATES (M)				*	LENGTH	BRG TYPE	VPH	EF		
H	W	V/C QUEUE	X1	Y1	X2	Y2	(M)	(DEG)		(G/MI)			
(M)	(M)	(VEH)											
-----*													
0.0	13.4	45.	95 SB TO 3 WB OFFRAM*	805696.3	*****	805647.1	*****	*	124.	203.	AG	2250.	4.1
0.0	13.4	46.	95 SB TO 3 WB OFFRAM*	805647.1	*****	805603.2	*****	*	71.	218.	AG	2250.	4.1
0.0	13.4	47.	95 SB TO 3 WB OFFRAM*	805603.2	*****	805521.8	*****	*	105.	231.	AG	2250.	4.1
0.0	13.4	48.	95 SB TO 3 WB OFFRAM*	805521.8	*****	805455.5	*****	*	83.	233.	AG	2250.	4.1
0.0	13.4	49.	WB 3 TO 95 SB ONRAMP*	805530.5	*****	805459.5	*****	*	71.	272.	AG	270.	4.2

2013 exsiting intersection													
0.0	9.8	50.	WB 3 TO 95 SB ONRAMP*	805459.5	*****	805417.3	*****	*	49.	300.	AG	270.	4.2
0.0	9.8	51.	WB 3 TO 95 SB ONRAMP*	805417.3	*****	805400.7	*****	*	35.	332.	AG	270.	4.2
0.0	9.8	52.	WB 3 TO 95 SB ONRAMP*	805400.7	*****	805398.9	*****	*	33.	357.	AG	270.	4.2
0.0	9.8	53.	WB 3 TO 95 SB ONRAMP*	805398.9	*****	805411.5	*****	*	41.	18.	AG	270.	4.2
0.0	9.8	54.	WB 3 TO 95 SB ONRAMP*	805411.5	*****	805466.3	*****	*	72.	50.	AG	270.	4.2
0.0	9.8	55.	WB 3 TO 95 SB ONRAMP*	805466.3	*****	805507.6	*****	*	49.	57.	AG	270.	4.2
0.0	9.8	56.	WB 3 TO 95 SB ONRAMP*	805507.6	*****	805535.9	*****	*	28.	84.	AG	270.	4.2
0.0	9.8	57.	WB 3 TO 95 SB ONRAMP*	805535.9	*****	805566.0	*****	*	31.	102.	AG	270.	4.2
0.0	9.8	58.	WB 3 TO 95 SB ONRAMP*	805566.0	*****	805589.3	*****	*	31.	132.	AG	270.	4.2
0.0	9.8	59.	WB 3 TO 95 SB ONRAMP*	805589.3	*****	805605.5	*****	*	34.	152.	AG	270.	4.2
0.0	9.8	60.	WB 3 TO 95 SB ONRAMP*	805605.5	*****	805607.7	*****	*	36.	177.	AG	270.	4.2
0.0	9.8	61.	WB 3 TO 95 SB ONRAMP*	805607.7	*****	805595.1	*****	*	61.	192.	AG	270.	4.2
0.0	9.8	62.	95 SB TO 3 EB OFFRAM*	805553.4	*****	805543.9	*****	*	35.	196.	AG	570.	6.4
0.0	9.8	63.	95 SB TO 3 EB OFFRAM*	805543.9	*****	805529.6	*****	*	33.	205.	AG	570.	6.4
0.0	9.8	64.	95 SB TO 3 EB OFFRAM*	805529.6	*****	805510.3	*****	*	30.	221.	AG	570.	6.4
0.0	9.8	65.	95 SB TO 3 EB OFFRAM*	805510.3	*****	805477.9	*****	*	34.	251.	AG	570.	6.4
0.0	9.8	66.	95 SB TO 3 EB OFFRAM*	805477.9	*****	805439.8	*****	*	38.	277.	AG	570.	6.4
0.0	9.8	67.	95 SB TO 3 EB OFFRAM*	805439.8	*****	805417.3	*****	*	27.	305.	AG	570.	6.4
0.0	9.8	68.	95 SB TO 3 EB OFFRAM*	805417.3	*****	805392.6	*****	*	50.	330.	AG	570.	6.4
0.0	9.8	69.	95 SB TO 3 EB OFFRAM*	805392.6	*****	805386.3	*****	*	31.	348.	AG	570.	6.4
0.0	9.8	70.	95 SB TO 3 EB OFFRAM*	805386.3	*****	805392.6	*****	*	30.	12.	AG	570.	6.4
0.0	9.8	71.	95 SB TO 3 EB OFFRAM*	805392.6	*****	805402.9	*****	*	22.	28.	AG	570.	6.4
0.0	9.8	72.	95 SB TO 3 EB OFFRAM*	805402.9	*****	805429.4	*****	*	34.	52.	AG	570.	6.4
0.0	9.8	73.	95 SB TO 3 EB OFFRAM*	805429.4	*****	805462.2	*****	*	36.	67.	AG	570.	6.4

2013 existing intersection

0.0 74. 95 SB TO 3 EB OFFRAM* 805462.2 ***** 805545.7 ***** * 84. 86. AG 570. 6.4
 † 9.8

PAGE 3
 JOB:

RUN:

DATE : 07/22/ 0
 TIME : 10:28:57

 ADDITIONAL QUEUE LINK PARAMETERS

ARRIVAL	LINK DESCRIPTION	* * *	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	RATE
-----*										
	1. EB RIGHT QUE	*	170	83	2.0	11	1610	26.83	2	3
	2. EB THRU QUE	*	170	83	2.0	1839	1691	26.83	2	3
	3. EB LEFT QUE	*	170	131	2.0	273	1757	26.83	2	3
	4. NB LEFT QUE	*	170	156	2.0	21	1600	25.81	2	3
	5. NB RIGHT QUE	*	170	156	2.0	36	1600	25.81	2	3
	6. WB LEFT QUE	*	170	156	2.0	37	1723	25.81	2	3
	7. WB THRU QUE	*	170	108	2.0	2715	2828	25.81	2	3
	8. WB RIGHT QUE	*	170	108	2.0	935	1610	25.81	2	3
	9. WB RIGHT QUE	*	170	108	2.0	935	1610	25.81	2	3
	10. WB RIGHT QUE	*	170	108	2.0	935	1610	25.81	2	3
	11. SB LEFT QUE	*	170	130	2.0	848	1810	25.81	2	3
	12. SB TRHU QUE	*	170	130	2.0	13	1900	25.81	2	3
	13. SB RIGHT QUE	*	170	130	2.0	303	1610	25.81	2	3
	14. SB RIGHT QUE	*	170	130	2.0	303	1610	25.81	2	3
	15. SB RIGHT QUE	*	170	130	2.0	303	1610	25.81	2	3

 RECEPTOR LOCATIONS

RECEPTOR	* * *	X	COORDINATES (M) Y	Z	* * *
-----*					
1. B01	*	804972.1	*****	1.8	*
2. B02	*	804975.0	*****	1.8	*
3. B03	*	804981.8	*****	1.8	*
4. B04	*	804975.3	*****	1.8	*
5. B05	*	804947.5	*****	1.8	*
6. B06	*	804915.3	*****	1.8	*
7. B07	*	804926.8	*****	1.8	*
8. B08	*	804941.4	*****	1.8	*
9. B09	*	804994.2	*****	1.8	*

2013 existing intersection

10. B10	*	805072.4	*****	1.8	*
11. B11	*	805084.6	*****	1.8	*
12. B12	*	805103.1	*****	1.8	*
13. B13	*	805142.8	*****	1.8	*
14. B14	*	805111.7	*****	1.8	*
15. B15	*	805077.1	*****	1.8	*
16. B16	*	805034.2	*****	1.8	*
17. B17	*	805021.0	*****	1.8	*
18. B18	*	805013.5	*****	1.8	*

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JOB:

RUN:

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND * CONCENTRATION
ANGLE * (PPM)
(DEGR)* REC1 REC2 REC3 REC4 REC5 REC6 REC7 REC8 REC9 REC10 REC11 REC12 REC13 REC14 REC15 REC16
REC17 REC18

-----*

0.	*	3.4	3.5	3.4	3.2	3.0	2.9	3.4	3.4	3.6	3.5	3.6	3.5	2.9	2.9	2.9	2.9
3.0	3.0																
10.	*	3.4	3.5	3.7	3.3	3.1	2.9	3.5	3.5	3.5	3.6	3.7	3.4	2.9	2.9	2.9	2.9
3.1	2.9																
20.	*	3.5	3.5	3.7	3.4	3.1	3.0	3.5	3.6	3.4	3.6	3.5	3.3	2.9	2.9	2.9	2.9
3.1	2.9																
30.	*	3.5	3.5	3.6	3.4	3.1	3.0	3.5	3.5	3.4	3.5	3.3	3.3	2.9	2.9	2.9	2.9
3.1	2.9																
40.	*	3.4	3.4	3.4	3.3	3.1	3.0	3.4	3.5	3.4	3.4	3.4	3.4	2.9	2.9	2.9	2.9
3.1	2.9																
50.	*	3.4	3.4	3.5	3.3	3.1	3.0	3.5	3.5	3.6	3.4	3.5	3.3	2.9	2.9	2.9	2.9
3.1	2.9																
60.	*	3.4	3.4	3.6	3.3	3.1	3.0	3.5	3.4	3.6	3.4	3.3	3.3	2.9	2.9	2.9	2.9
3.1	2.9																
70.	*	3.4	3.5	3.5	3.3	3.2	3.1	3.5	3.5	3.6	3.3	3.2	3.2	2.9	2.9	2.9	2.9
3.1	2.9																
80.	*	3.4	3.5	3.5	3.6	3.6	3.5	3.1	3.1	3.5	3.2	3.2	3.1	3.0	3.0	3.0	3.0

2013 existing intersection

3.1	2.9																
90.	*	3.4	3.5	4.1	4.3	3.9	3.8	3.0	3.0	3.0	2.9	2.9	2.9	3.2	3.4	3.4	3.4
3.1	2.9																
100.	*	3.5	3.7	4.5	4.2	3.7	3.9	2.9	2.9	2.9	2.9	2.9	2.9	3.4	3.5	3.7	3.7
3.4	3.1																
110.	*	3.7	3.8	4.2	3.9	3.8	3.7	2.9	2.9	2.9	2.9	2.9	2.9	3.4	3.7	3.8	3.7
3.4	3.2																
120.	*	3.7	3.9	4.0	3.7	3.7	3.5	2.9	2.9	2.9	2.9	2.9	2.9	3.6	3.6	3.8	3.8
3.5	3.2																
130.	*	3.9	3.9	3.8	3.6	3.6	3.5	2.9	2.9	2.9	2.9	2.9	2.9	3.6	3.7	3.8	3.9
3.7	3.3																
140.	*	3.9	3.7	3.8	3.7	3.6	3.4	2.9	2.9	2.9	2.9	2.9	2.9	3.5	3.7	3.8	3.9
3.6	3.3																
150.	*	3.8	3.7	3.7	3.6	3.4	3.4	2.9	2.9	2.9	2.9	2.9	2.9	3.5	3.7	3.8	3.9
3.6	3.4																
160.	*	3.3	3.4	3.6	3.6	3.4	3.4	2.9	2.9	2.9	2.9	2.9	2.9	3.5	3.7	3.8	3.8
3.5	3.3																
170.	*	3.2	3.4	3.6	3.6	3.4	3.4	2.9	2.9	2.9	2.9	2.9	2.9	3.5	3.8	3.9	3.7
3.4	3.3																
180.	*	3.1	3.2	3.5	3.5	3.5	3.4	2.9	2.9	2.9	2.9	2.9	2.9	3.6	3.8	3.9	3.7
3.5	3.3																
190.	*	3.1	3.2	3.4	3.5	3.4	3.4	2.9	2.9	2.9	2.9	2.9	2.9	3.6	3.8	3.9	3.4
3.7	3.5																
200.	*	3.1	3.2	3.3	3.4	3.5	3.5	2.9	2.9	2.9	2.9	2.9	2.9	3.6	3.8	3.9	3.5
4.0	3.5																
210.	*	3.0	3.1	3.3	3.4	3.5	3.6	2.9	2.9	2.9	2.9	2.9	2.9	3.6	3.9	3.8	3.4
4.1	3.6																
220.	*	3.1	3.1	3.3	3.5	3.5	3.6	2.9	2.9	2.9	2.9	2.9	2.9	3.8	3.9	3.8	3.4
4.2	3.6																
230.	*	3.0	3.1	3.3	3.7	3.6	3.6	2.9	2.9	2.9	2.9	2.9	2.9	3.8	3.9	3.9	3.6
4.3	3.5																
240.	*	3.0	3.0	3.3	3.6	3.7	3.6	2.9	2.9	2.9	2.9	2.9	2.9	3.9	4.0	3.6	3.9
4.2	3.4																
250.	*	2.9	2.9	3.1	3.5	3.4	3.4	3.0	3.0	2.9	2.9	2.9	2.9	3.8	3.9	3.8	3.8
4.0	3.4																
260.	*	2.9	2.9	2.9	3.1	3.1	3.0	3.2	3.2	3.3	2.9	2.9	2.9	3.4	3.5	3.4	3.7
3.7	3.3																
270.	*	2.9	2.9	2.9	2.9	2.9	2.9	3.3	3.4	3.4	3.2	3.1	3.1	2.9	2.9	3.0	3.4
3.6	3.2																
280.	*	2.9	2.9	2.9	2.9	2.9	2.9	3.4	3.4	3.4	3.3	3.4	3.3	2.9	3.0	3.0	3.4
3.6	3.2																
290.	*	2.9	2.9	2.9	2.9	2.9	2.9	3.4	3.5	3.5	3.3	3.2	3.2	2.9	3.0	3.0	3.4
3.6	3.3																
300.	*	2.9	2.9	2.9	2.9	2.9	2.9	3.5	3.4	3.4	3.3	3.2	3.3	2.9	3.0	3.0	3.4
3.4	3.4																
310.	*	2.9	2.9	2.9	2.9	2.9	2.9	3.4	3.5	3.6	3.3	3.3	3.5	2.9	3.0	3.0	3.3
3.6	3.4																
320.	*	2.9	2.9	2.9	2.9	2.9	2.9	3.4	3.4	3.5	3.5	3.5	3.5	2.9	2.9	3.0	3.3

2013 existing intersection

3.5	3.4																
330.	*	2.9	2.9	2.9	2.9	2.9	2.9	3.4	3.4	3.6	3.6	3.5	3.6	2.9	2.9	2.9	3.2
3.5	3.5																
340.	*	2.9	3.0	3.1	2.9	2.9	2.9	3.4	3.4	3.6	3.5	3.5	3.6	2.9	2.9	2.9	3.2
3.4	3.4																
350.	*	3.1	3.1	3.2	3.1	2.9	2.9	3.4	3.5	3.7	3.5	3.5	3.5	2.9	2.9	2.9	2.9
3.3	3.2																

-----*

MAX	*	3.9	3.9	4.5	4.3	3.9	3.9	3.5	3.6	3.7	3.6	3.7	3.6	3.9	4.0	3.9	3.9
4.3	3.6																
DEGR.	*	140	130	100	90	90	100	300	20	350	10	10	330	240	240	230	240
230	210																

THE HIGHEST CONCENTRATION OF 4.50 PPM OCCURRED AT RECEPTOR REC3 .

♀

PAGE 5
JOB:

RUN:

DATE : 07/22/ 0
TIME : 10:28:57

RECEPTOR - LINK MATRIX FOR THE ANGLE PRODUCING THE MAXIMUM CONCENTRATION FOR EACH RECEPTOR

		* CO/LINK (PPM)															
		* ANGLE (DEGREES)															
		REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16
REC17	REC18																
LINK #	*	140	130	100	90	90	100	300	20	350	10	10	330	240	240	230	240
230	210																

-----*

0.0	1	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																
0.0	2	*	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																
0.0	3	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																
0.0	4	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																
0.0	5	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																
0.0	6	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

2013 exsiting intersection

0.0	0.0																
	7 *	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.0
0.0	0.0																
	8 *	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.0	0.0																
	9 *	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0
0.0	0.0																
	10 *	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2	0.2	0.1	0.0
0.0	0.0																
	11 *	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1
0.1	0.1																
	12 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																
	13 *	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.4	0.0																
	14 *	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.1																
	15 *	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																
	16 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																
	17 *	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.1	0.1	0.1
0.1	0.1																
	18 *	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.2	0.3	0.2	0.2	0.1	0.1	0.0
0.0	0.0																
	19 *	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.0
0.0	0.0																
	20 *	0.0	0.0	0.0	0.0	0.3	0.4	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.1	0.1	0.3
0.2	0.1																
	21 *	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
0.1	0.0																
	22 *	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
0.1	0.0																
	23 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
0.0	0.0																
	24 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.2	0.0																
	25 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.1	0.0																
	26 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.2																
	27 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																
	28 *	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
0.1	0.1																
	29 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																
	30 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

2013 existing intersection

0.0	0.0																
0.0	31 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	32 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	33 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	34 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	35 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	36 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	37 *	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	38 *	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	39 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	40 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	41 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	42 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	43 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	44 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	45 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																

♀
PAGE 6
JOB:

RUN:

		* CO/LINK (PPM) * ANGLE (DEGREES) *															
REC17	REC18	REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16
LINK #	*	140	130	100	90	90	100	300	20	350	10	10	330	240	240	230	240
230	210																
-----*																	
0.0	46 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																
	47 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

2013 exiting intersection

0.0	0.0																
	72 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																
	73 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																
	74 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																

1 2013 northern interchange area
 CAL3QHC - (DATED 95221)

CAL3QHC PC (32 BIT) VERSION 3.0.0
 (C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

Run Began on 7/23/2014 at 8:42:06

JOB: SOUTHERN INTERCHANGE AREA

RUN: EXISTING 2013

DATE : 07/23/ 0
 TIME : 08:42:06

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 175. CM
 U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 2.9 PPM

LINK VARIABLES

H	W	LINK DESCRIPTION V/C QUEUE (VEH)	* X1	LINK COORDINATES (M) Y1	X2	Y2	* (M)	BRG TYPE (DEG)	VPH	EF (G/MI)
0.0	13.4	1. OFF RAMP	* 806140.8	*****	806184.8	*****	* 98.	27. AG	1330.	3.7
0.0	13.4	2. OFF RAMP	* 806184.8	*****	806392.4	*****	* 377.	33. AG	1330.	3.7
0.0	17.1	3. 95 NB	* 806130.7	*****	806210.7	*****	* 184.	26. AG	2640.	3.4
0.0	17.1	4. 95 NB	* 806210.7	*****	806356.3	*****	* 275.	32. AG	2640.	3.4
0.0	17.1	5. 95 NB	* 806356.3	*****	806466.8	*****	* 186.	37. AG	2640.	3.4
0.0	17.1	6. 95 SB	* 806276.4	*****	806111.9	*****	* 319.	211. AG	6150.	1.5
0.0	17.1	7. 95 SB	* 806111.9	*****	806049.2	*****	* 158.	203. AG	6150.	1.5
0.0	17.1	8. 95 SB	* 806049.2	*****	805945.3	*****	* 314.	199. AG	6150.	1.5
0.0	17.1	9. 95 SB	* 805945.3	*****	805869.6	*****	* 270.	196. AG	6150.	1.5
0.0	17.1	10. OFF RAMP	* 806394.4	*****	806434.4	*****	* 54.	48. AG	180.	3.1

2013 northern interchange area

0.0	9.8												
	11.	OFF RAMP	*	806434.4	*****	806519.2	*****	*	94.	64.	AG	180.	3.1
0.0	9.8												
	12.	OFF RAMP	*	806519.2	*****	806617.9	*****	*	100.	81.	AG	180.	3.1
0.0	9.8												
	13.	OFF RAMP	*	806617.9	*****	806679.1	*****	*	64.	74.	AG	180.	3.1
0.0	9.8												
	14.	OFF RAMP	*	806679.1	*****	806781.9	*****	*	128.	54.	AG	180.	3.1
0.0	9.8												
	15.	OFF RAMP	*	806781.9	*****	806816.1	*****	*	35.	82.	AG	180.	3.1
0.0	9.8												
	16.	OFF RAMP	*	806816.1	*****	806843.9	*****	*	29.	106.	AG	180.	3.1
0.0	9.8												
	17.	OFF RAMP	*	806843.9	*****	806867.5	*****	*	26.	115.	AG	180.	3.1
0.0	9.8												
	18.	THRU RD	*	806391.1	*****	806608.9	*****	*	352.	38.	AG	1150.	3.3
0.0	9.8												
	19.	THRU RD	*	806610.6	*****	806697.9	*****	*	133.	41.	AG	1490.	2.8
0.0	13.4												
	20.	THRU RD	*	806699.5	*****	806940.1	*****	*	373.	40.	AG	340.	1.9
0.0	9.8												
	21.	THRU RD	*	806945.0	*****	807196.3	*****	*	396.	39.	AG	670.	2.2
0.0	13.4												
	22.	THRU RD	*	807196.3	*****	807277.0	*****	*	134.	37.	AG	670.	2.2
0.0	13.4												
	23.	THRU RD	*	807277.0	*****	807343.1	*****	*	117.	35.	AG	670.	2.2
0.0	13.4												
	24.	95 NB	*	807339.8	*****	807633.5	*****	*	463.	39.	AG	3310.	4.1
0.0	17.1												
	25.	95 SB	*	807601.7	*****	807237.0	*****	*	557.	221.	AG	5630.	1.5
0.0	17.1												
	26.	95 SB	*	807236.2	*****	807005.4	*****	*	359.	220.	AG	5360.	4.4
0.0	17.1												
	27.	95 SB	*	807005.4	*****	806635.0	*****	*	575.	220.	AG	4890.	4.4
0.0	17.1												
	28.	OFF RAMP	*	806997.2	*****	806853.7	*****	*	223.	220.	AG	470.	4.4
0.0	9.8												
	29.	OFF RAMP	*	806853.7	*****	806815.3	*****	*	49.	231.	AG	470.	4.4
0.0	9.8												
	30.	OFF RAMP	*	806815.3	*****	806765.6	*****	*	54.	247.	AG	470.	4.4
0.0	9.8												
	31.	OFF RAMP	*	806765.6	*****	806708.5	*****	*	59.	254.	AG	470.	4.4
0.0	9.8												
	32.	OFF RAMP	*	806706.8	*****	806651.4	*****	*	55.	269.	AG	470.	2.7
0.0	9.8												
	33.	OFF RAMP	*	806651.4	*****	806550.2	*****	*	103.	259.	AG	470.	2.7
0.0	9.8												
	34.	OFF RAMP	*	806550.2	*****	806459.7	*****	*	103.	241.	AG	470.	2.7

2013 northern interchange area

0.0	9.8											
	35.	OFF RAMP	*	806459.7	*****	806409.1	*****	*	51.	266.	AG	470. 2.7
0.0	9.8											
	36.	OFF RAMP	*	806409.1	*****	806366.7	*****	*	46.	292.	AG	470. 2.7
0.0	9.8											
	37.	OFF RAMP	*	806366.7	*****	806322.6	*****	*	54.	305.	AG	470. 2.7
0.0	9.8											
	38.	ON RAMP	*	806585.3	*****	806539.6	*****	*	65.	316.	AG	140. 3.7
0.0	9.8											
	39.	ON RAMP	*	806539.6	*****	806520.8	*****	*	47.	337.	AG	140. 3.7
0.0	9.8											
	40.	ON RAMP	*	806520.8	*****	806518.4	*****	*	53.	357.	AG	140. 3.7
0.0	9.8											
	41.	ON RAMP	*	806518.4	*****	806544.5	*****	*	44.	36.	AG	140. 3.7
0.0	9.8											
	42.	ON RAMP	*	806544.5	*****	806587.7	*****	*	46.	70.	AG	140. 3.7
0.0	9.8											
	43.	ON RAMP	*	806587.7	*****	806633.4	*****	*	48.	106.	AG	140. 3.7
0.0	9.8											
	44.	ON RAMP	*	806633.4	*****	806658.7	*****	*	41.	142.	AG	140. 3.7

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JOB: SOUTHERN INTERCHANGE AREA

RUN: EXISTING 2013

DATE : 07/23/ 0

TIME : 08:42:06

LINK VARIABLES

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

0.0	9.8											
	45.	ON RAMP	*	806658.7	*****	806662.0	*****	*	39.	175.	AG	140. 3.7
0.0	9.8											
	46.	ON RAMP	*	806662.0	*****	806648.9	*****	*	58.	193.	AG	140. 3.7
0.0	9.8											
	47.	ON RAMP	*	806648.9	*****	806627.7	*****	*	37.	215.	AG	140. 3.7
0.0	9.8											
	48.	ON RAMP	*	806559.2	*****	806531.4	*****	*	44.	220.	AG	470. 2.7
0.0	9.8											
	49.	ON RAMP	*	806531.4	*****	806505.3	*****	*	32.	235.	AG	470. 2.7
0.0	9.8											

2013 northern interchange area

0.0	9.8	50. ON RAMP	* 806505.3	*****	806451.5	*****	*	56.	252.	AG	470.	2.7
0.0	9.8	51. ON RAMP	* 806451.5	*****	806409.9	*****	*	43.	282.	AG	470.	2.7
0.0	9.8	52. ON RAMP	* 806409.9	*****	806383.8	*****	*	40.	319.	AG	470.	2.7
0.0	9.8	53. ON RAMP	* 806383.8	*****	806377.3	*****	*	37.	350.	AG	470.	2.7
0.0	9.8	54. ON RAMP	* 806377.3	*****	806386.2	*****	*	37.	14.	AG	470.	2.7
0.0	9.8	55. ON RAMP	* 806386.2	*****	806419.7	*****	*	46.	47.	AG	470.	2.7
0.0	9.8	56. ON RAMP	* 806419.7	*****	806465.4	*****	*	46.	82.	AG	470.	2.7
0.0	9.8	57. ON RAMP	* 806465.4	*****	806497.2	*****	*	32.	102.	AG	470.	2.7
0.0	9.8	58. ON RAMP	* 806497.2	*****	806576.3	*****	*	92.	120.	AG	470.	2.7
0.0	9.8	59. ON RAMP	* 806663.6	*****	806708.5	*****	*	64.	135.	AG	340.	3.9
0.0	9.8	60. ON RAMP	* 806708.5	*****	806720.7	*****	*	31.	157.	AG	340.	3.9
0.0	9.8	61. ON RAMP	* 806720.7	*****	806724.0	*****	*	42.	175.	AG	340.	3.9
0.0	9.8	62. ON RAMP	* 806724.0	*****	806705.2	*****	*	45.	205.	AG	340.	3.9
0.0	9.8	63. ON RAMP	* 806705.2	*****	806675.8	*****	*	39.	230.	AG	340.	3.9
0.0	9.8	64. ON RAMP	* 806675.8	*****	806631.0	*****	*	45.	264.	AG	340.	3.9
0.0	9.8	65. ON RAMP	* 806631.0	*****	806595.1	*****	*	41.	298.	AG	340.	3.9
0.0	9.8	66. ON RAMP	* 806595.1	*****	806576.3	*****	*	54.	340.	AG	340.	3.9
0.0	9.8	67. ON RAMP	* 806576.3	*****	806586.1	*****	*	39.	15.	AG	340.	3.9
0.0	9.8	68. ON RAMP	* 806586.1	*****	806622.0	*****	*	67.	33.	AG	340.	3.9
0.0	9.8	69. OFF RAMP	* 806706.0	*****	806730.5	*****	*	36.	43.	AG	1150.	2.6
0.0	9.8	70. OFF RAMP	* 806730.5	*****	806766.4	*****	*	41.	62.	AG	1150.	2.6
0.0	9.8	71. OFF RAMP	* 806766.4	*****	806809.6	*****	*	43.	88.	AG	1150.	2.6
0.0	9.8	72. OFF RAMP	* 806809.6	*****	806843.1	*****	*	42.	127.	AG	1150.	2.6
0.0	9.8	73. OFF RAMP	* 806843.1	*****	806854.5	*****	*	38.	162.	AG	1150.	2.6

2013 northern interchange area

0.0	9.8	74. OFF RAMP	* 806854.5	*****	806845.5	*****	*	42.	192.	AG	1150.	2.6
0.0	9.8	75. OFF RAMP	* 806845.5	*****	806819.4	*****	*	38.	224.	AG	1150.	2.6
0.0	9.8	76. OFF RAMP	* 806819.4	*****	806781.1	*****	*	40.	253.	AG	1150.	2.6
0.0	9.8	77. OFF RAMP	* 806781.1	*****	806734.6	*****	*	48.	282.	AG	1150.	2.6
0.0	9.8	78. OFF RAMP	* 806734.6	*****	806677.5	*****	*	65.	298.	AG	1150.	2.6
0.0	9.8	79. ON RAMP	* 806889.5	*****	806839.0	*****	*	58.	299.	AG	330.	2.4
0.0	9.8	80. ON RAMP	* 806839.0	*****	806821.0	*****	*	49.	338.	AG	330.	2.4
0.0	9.8	81. ON RAMP	* 806821.0	*****	806888.7	*****	*	143.	28.	AG	330.	2.4
0.0	9.8	82. ON RAMP	* 806888.7	*****	806901.8	*****	*	96.	8.	AG	330.	2.4
0.0	9.8	83. ON RAMP	* 806901.8	*****	806905.0	*****	*	106.	2.	AG	330.	2.4
0.0	9.8	84. ON RAMP	* 806905.0	*****	806943.4	*****	*	87.	26.	AG	330.	2.4
0.0	17.1	85. 95 NB	* 806467.8	*****	806631.8	*****	*	254.	40.	AG	2640.	3.4
0.0	17.1	86. 95 NB	* 806631.0	*****	807197.1	*****	*	876.	40.	AG	2640.	1.5
0.0	17.1	87. 95 NB	* 807193.8	*****	807335.7	*****	*	218.	41.	AG	2640.	3.4
0.0	17.1	88. 95 SB	* 806631.6	*****	806565.5	*****	*	107.	218.	AG	5030.	2.3
0.0	17.1	89. 95 SB	* 806561.8	*****	806402.2	*****	*	247.	220.	AG	4560.	1.9
0.0	17.1	90. 95 SB	* 806402.2	*****	806275.2	*****	*	218.	216.	AG	4560.	1.9
0.0	20.7	91. EB 17	* 806238.4	*****	806323.5	*****	*	108.	128.	AG	3152.	2.0
0.0	17.1	92. EB 17	* 806321.4	*****	806583.9	*****	*	329.	127.	AG	1562.	2.9
0.0	17.1	93. EB 17	* 806583.0	*****	806669.2	*****	*	110.	128.	AG	2032.	2.5
0.0	17.1	94. EB 17	* 806668.0	*****	806754.2	*****	*	106.	126.	AG	1692.	2.8
0.0	17.1	95. EB 17	* 806754.2	*****	806869.5	*****	*	136.	122.	AG	1692.	2.8

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JOB: SOUTHERN INTERCHANGE AREA

RUN: EXISTING 2013

2013 northern interchange area

DATE : 07/23/ 0
 TIME : 08:42:06

LINK VARIABLES

H	W	LINK DESCRIPTION V/C QUEUE (VEH)	LINK COORDINATES (M)				LENGTH (M)	BRG TYPE (DEG)	VPH	EF (G/MI)	
			X1	Y1	X2	Y2					
0.0	13.4	96. EB 17	* 806869.2	*****	807123.5	*****	*	277.	113. AG	1872.	2.3
0.0	13.4	97. WB 17	* 807127.0	*****	806875.2	*****	*	274.	293. AG	1063.	2.7
0.0	17.1	98. WB 17	* 806875.5	*****	806671.8	*****	*	247.	304. AG	733.	2.5
0.0	17.1	99. WB 17	* 806672.7	*****	806576.3	*****	*	122.	308. AG	1883.	2.5
0.0	17.1	100. WB 17	* 806576.0	*****	806317.8	*****	*	327.	308. AG	1743.	2.2
0.0	17.1	101. WB 17	* 806319.0	*****	806251.5	*****	*	86.	308. AG	2213.	3.5
0.0	9.8	102. ON RAMP	* 806332.7	*****	806367.1	*****	*	47.	133. AG	1590.	3.6
0.0	9.8	103. ON RAMP	* 806367.1	*****	806378.6	*****	*	51.	167. AG	1590.	3.6
0.0	9.8	104. ON RAMP	* 806378.6	*****	806354.4	*****	*	112.	192. AG	1590.	3.6
0.0	9.8	105. ON RAMP	* 806354.4	*****	806349.3	*****	*	54.	185. AG	1590.	3.6
0.0	9.8	106. ON RAMP	* 806349.3	*****	806360.7	*****	*	76.	171. AG	1590.	3.6
0.0	9.8	107. ON RAMP	* 806360.7	*****	806364.6	*****	*	32.	173. AG	1590.	3.6
0.0	9.8	108. ON RAMP	* 806363.3	*****	806358.2	*****	*	55.	185. AG	1590.	2.8
0.0	9.8	109. ON RAMP	* 806358.2	*****	806345.5	*****	*	55.	193. AG	1590.	2.8
0.0	9.8	110. ON RAMP	* 806345.5	*****	806288.2	*****	*	100.	215. AG	1590.	2.8

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JOB: SOUTHERN INTERCHANGE AREA

RUN: EXISTING 2013

2013 northern interchange area

DATE : 07/23/ 0
 TIME : 08:42:06

ADDITIONAL QUEUE LINK PARAMETERS

ARRIVAL	LINK DESCRIPTION	* CYCLE	RED	CLEARANCE	APPROACH	SATURATION	IDLE	SIGNAL	
		* LENGTH (SEC)	TIME (SEC)	LOST TIME (SEC)	VOL (VPH)	FLOW RATE (VPH)	EM FAC (gm/hr)	TYPE	RATE

RECEPTOR LOCATIONS

RECEPTOR	* X	COORDINATES (M)	Z	*
		Y		
1. A17	* 806612.8	*****	1.8	*
2. A18	* 806860.7	*****	1.8	*
3. A19	* 806866.7	*****	1.8	*
4. A20	* 806715.6	*****	1.8	*
5. A21	* 806310.4	*****	1.8	*
6. A22	* 806306.4	*****	1.8	*

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JOB: SOUTHERN INTERCHANGE AREA

RUN: EXISTING 2013

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	* CONCENTRATION (PPM)	REC1	REC2	REC3	REC4	REC5	REC6
0.	* 2.9	3.1	3.0	2.9	2.9	2.9	2.9
10.	* 3.0	3.0	3.0	2.9	2.9	2.9	2.9
20.	* 3.0	3.0	2.9	2.9	2.9	2.9	2.9
30.	* 2.9	3.0	2.9	2.9	2.9	2.9	2.9
40.	* 2.9	3.0	2.9	2.9	2.9	2.9	2.9
50.	* 2.9	3.0	2.9	3.1	2.9	3.0	3.0

2013 northern interchange area

60.	*	2.9	3.0	2.9	3.1	3.0	3.1
70.	*	2.9	3.0	2.9	3.1	3.0	2.9
80.	*	2.9	3.0	2.9	3.1	3.0	2.9
90.	*	2.9	3.0	2.9	3.1	2.9	2.9
100.	*	2.9	3.0	2.9	3.0	2.9	2.9
110.	*	2.9	3.0	2.9	3.0	2.9	2.9
120.	*	2.9	2.9	2.9	3.0	2.9	2.9
130.	*	2.9	2.9	2.9	3.0	2.9	2.9
140.	*	2.9	2.9	2.9	3.0	2.9	2.9
150.	*	2.9	2.9	2.9	3.0	2.9	2.9
160.	*	2.9	2.9	2.9	3.0	2.9	2.9
170.	*	2.9	2.9	2.9	3.1	2.9	2.9
180.	*	2.9	2.9	2.9	3.1	2.9	2.9
190.	*	2.9	2.9	2.9	3.0	2.9	2.9
200.	*	2.9	2.9	2.9	3.0	2.9	2.9
210.	*	2.9	2.9	2.9	2.9	2.9	2.9
220.	*	2.9	2.9	2.9	2.9	2.9	2.9
230.	*	2.9	2.9	2.9	2.9	2.9	2.9
240.	*	2.9	2.9	2.9	2.9	2.9	2.9
250.	*	2.9	2.9	2.9	2.9	2.9	2.9
260.	*	2.9	2.9	2.9	2.9	2.9	2.9
270.	*	2.9	2.9	2.9	2.9	2.9	2.9
280.	*	2.9	2.9	2.9	2.9	2.9	2.9
290.	*	2.9	2.9	2.9	2.9	2.9	2.9
300.	*	2.9	2.9	2.9	2.9	2.9	2.9
310.	*	2.9	3.0	2.9	2.9	2.9	2.9
320.	*	2.9	3.0	3.0	2.9	2.9	2.9
330.	*	2.9	3.0	3.0	2.9	2.9	2.9
340.	*	2.9	3.1	3.0	2.9	2.9	2.9
350.	*	2.9	3.1	3.0	2.9	2.9	2.9
-----*							
MAX	*	3.0	3.1	3.0	3.1	3.0	3.1
DEGR.	*	20	0	350	50	80	60

THE HIGHEST CONCENTRATION OF 3.10 PPM OCCURRED AT RECEPTOR REC2 .

†

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JOB: SOUTHERN INTERCHANGE AREA

RUN: EXISTING 2013

DATE : 07/23/ 0

TIME : 08:42:06

RECEPTOR - LINK MATRIX FOR THE ANGLE PRODUCING
THE MAXIMUM CONCENTRATION FOR EACH RECEPTOR

* CO/LINK (PPM)

2013 northern interchange area

LINK #	ANGLE (DEGREES)					
	REC1 20	REC2 0	REC3 350	REC4 50	REC5 80	REC6 60
1	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0	0.0	0.0
23	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.1	0.0	0.0
27	0.1	0.1	0.1	0.1	0.1	0.1
28	0.0	0.0	0.0	0.0	0.0	0.0
29	0.0	0.0	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0	0.0	0.0
31	0.0	0.0	0.0	0.0	0.0	0.0
32	0.0	0.0	0.0	0.0	0.0	0.0
33	0.0	0.0	0.0	0.0	0.0	0.0
34	0.0	0.0	0.0	0.0	0.0	0.0
35	0.0	0.0	0.0	0.0	0.0	0.0
36	0.0	0.0	0.0	0.0	0.0	0.0
37	0.0	0.0	0.0	0.0	0.0	0.0
38	0.0	0.0	0.0	0.0	0.0	0.0
39	0.0	0.0	0.0	0.0	0.0	0.0
40	0.0	0.0	0.0	0.0	0.0	0.0
41	0.0	0.0	0.0	0.0	0.0	0.0
42	0.0	0.0	0.0	0.0	0.0	0.0
43	0.0	0.0	0.0	0.0	0.0	0.0
44	0.0	0.0	0.0	0.0	0.0	0.0

2013 northern interchange area

45 * 0.0 0.0 0.0 0.0 0.0 0.0

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JOB: SOUTHERN INTERCHANGE AREA

RUN: EXISTING 2013

LINK #	CO/LINK (PPM)					
	REC1	REC2	REC3	REC4	REC5	REC6
	20	0	350	50	80	60
46	0.0	0.0	0.0	0.0	0.0	0.0
47	0.0	0.0	0.0	0.0	0.0	0.0
48	0.0	0.0	0.0	0.0	0.0	0.0
49	0.0	0.0	0.0	0.0	0.0	0.0
50	0.0	0.0	0.0	0.0	0.0	0.0
51	0.0	0.0	0.0	0.0	0.0	0.0
52	0.0	0.0	0.0	0.0	0.0	0.0
53	0.0	0.0	0.0	0.0	0.0	0.0
54	0.0	0.0	0.0	0.0	0.0	0.0
55	0.0	0.0	0.0	0.0	0.0	0.0
56	0.0	0.0	0.0	0.0	0.0	0.0
57	0.0	0.0	0.0	0.0	0.0	0.0
58	0.0	0.0	0.0	0.0	0.0	0.0
59	0.0	0.0	0.0	0.0	0.0	0.0
60	0.0	0.0	0.0	0.0	0.0	0.0
61	0.0	0.0	0.0	0.0	0.0	0.0
62	0.0	0.0	0.0	0.0	0.0	0.0
63	0.0	0.0	0.0	0.0	0.0	0.0
64	0.0	0.0	0.0	0.0	0.0	0.0
65	0.0	0.0	0.0	0.0	0.0	0.0
66	0.0	0.0	0.0	0.0	0.0	0.0
67	0.0	0.0	0.0	0.0	0.0	0.0
68	0.0	0.0	0.0	0.0	0.0	0.0
69	0.0	0.0	0.0	0.0	0.0	0.0
70	0.0	0.0	0.0	0.0	0.0	0.0
71	0.0	0.0	0.0	0.0	0.0	0.0
72	0.0	0.0	0.0	0.0	0.0	0.0
73	0.0	0.0	0.0	0.0	0.0	0.0
74	0.0	0.0	0.0	0.0	0.0	0.0
75	0.0	0.0	0.0	0.0	0.0	0.0
76	0.0	0.0	0.0	0.0	0.0	0.0
77	0.0	0.0	0.0	0.0	0.0	0.0
78	0.0	0.0	0.0	0.0	0.0	0.0
79	0.0	0.0	0.0	0.0	0.0	0.0
80	0.0	0.0	0.0	0.0	0.0	0.0
81	0.0	0.0	0.0	0.0	0.0	0.0
82	0.0	0.0	0.0	0.0	0.0	0.0

2013 northern interchange area

83	*	0.0	0.0	0.0	0.0	0.0	0.0
84	*	0.0	0.0	0.0	0.0	0.0	0.0
85	*	0.0	0.0	0.0	0.0	0.0	0.0
86	*	0.0	0.0	0.0	0.0	0.0	0.0
87	*	0.0	0.0	0.0	0.0	0.0	0.0
88	*	0.0	0.0	0.0	0.0	0.0	0.0
89	*	0.0	0.0	0.0	0.0	0.0	0.0
90	*	0.0	0.0	0.0	0.0	0.0	0.0
91	*	0.0	0.0	0.0	0.0	0.0	0.0
92	*	0.0	0.0	0.0	0.0	0.0	0.0
93	*	0.0	0.0	0.0	0.0	0.0	0.0
94	*	0.0	0.0	0.0	0.0	0.0	0.0
95	*	0.0	0.1	0.0	0.0	0.0	0.0
96	*	0.0	0.0	0.0	0.0	0.0	0.0
97	*	0.0	0.0	0.0	0.0	0.0	0.0
98	*	0.0	0.0	0.0	0.0	0.0	0.0

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JOB: SOUTHERN INTERCHANGE AREA

RUN: EXISTING 2013

LINK #	*	CO/LINK (PPM)					
		ANGLE (DEGREES)					
*	*	REC1	REC2	REC3	REC4	REC5	REC6
*	*	20	0	350	50	80	60
99	*	0.0	0.0	0.0	0.0	0.0	0.0
100	*	0.0	0.0	0.0	0.0	0.0	0.0
101	*	0.0	0.0	0.0	0.0	0.0	0.0
102	*	0.0	0.0	0.0	0.0	0.0	0.0
103	*	0.0	0.0	0.0	0.0	0.0	0.0
104	*	0.0	0.0	0.0	0.0	0.0	0.0
105	*	0.0	0.0	0.0	0.0	0.0	0.0
106	*	0.0	0.0	0.0	0.0	0.0	0.1
107	*	0.0	0.0	0.0	0.0	0.0	0.0
108	*	0.0	0.0	0.0	0.0	0.0	0.0
109	*	0.0	0.0	0.0	0.0	0.0	0.0
110	*	0.0	0.0	0.0	0.0	0.0	0.0

1 2040 build intersection
 CAL3QHC - (DATED 95221)

CAL3QHC PC (32 BIT) VERSION 3.0.0
 (C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

Run Began on 7/23/2014 at 8:34:35

JOB: 2040 BUILD INTERSECTION

RUN:

DATE : 07/23/ 0
 TIME : 08:34:35

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 175. CM
 U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 2.9 PPM

LINK VARIABLES

H	W	LINK DESCRIPTION V/C QUEUE	* X1	Y1	X2	Y2	* LENGTH (M)	BRG TYPE (DEG)	VPH	EF (G/MI)
0.0	3.7	1. EB RIGHT QUE 0.02 0.4	804999.5	*****	804996.9	*****	3.	267. AG	6.	100.0
0.0	11.0	2. EB THRU QUE 2.93 922.0	804999.5	*****	799607.2	*****	5532.	257. AG	6.	100.0
0.0	7.3	3. EB LEFT QUE 0.48 6.8	804996.2	*****	804956.5	*****	41.	258. AG	18.	100.0
0.0	3.7	4. NB LEFT QUE 0.25 1.3	805015.3	*****	805016.2	*****	8.	173. AG	11.	100.0
0.0	3.7	5. NB RIGHT QUE 0.41 2.1	805019.2	*****	805020.8	*****	13.	173. AG	11.	100.0
0.0	7.3	6. WB LEFT QUE 0.19 1.1	805035.3	*****	805041.7	*****	6.	90. AG	22.	100.0
0.0	11.0	7. WB THRU QUE 1.84 343.5	805033.3	*****	807084.6	*****	2061.	84. AG	22.	100.0
0.0	7.3	8. SB LEFT QUE 1.49 129.1	805002.1	*****	804854.4	*****	775.	349. AG	18.	100.0
0.0	3.7	9. SB TRHU QUE 0.05 0.7	804998.1	*****	804997.2	*****	4.	348. AG	9.	100.0
		10. SB RIGHT QUE	804977.3	*****	805016.9	*****	59.	42. AG	9.	100.0

2040 build intersection

0.0	3.7	0.76	9.9										
	11.	SB RIGHT QUE		*	804986.3	*****	804997.4	*****	*	59.	11.	AG	9. 100.0
0.0	3.7	0.76	9.9										
	12.	SB RIGHT QUE		*	804988.9	*****	804979.2	*****	*	59.	351.	AG	9. 100.0
0.0	3.7	0.76	9.9										
	13.	EB FREE APP		*	804767.0	*****	804887.6	*****	*	129.	70.	AG	2990. 2.0
0.0	20.7												
	14.	EB FREE APP		*	804887.6	*****	805017.3	*****	*	133.	76.	AG	2990. 2.0
0.0	20.7												
	15.	EB FREE DEC		*	805017.6	*****	805193.2	*****	*	176.	84.	AG	3870. 4.2
0.0	20.7												
	16.	WB FREE DEC		*	805010.7	*****	804939.9	*****	*	72.	259.	AG	4230. 3.7
0.0	20.7												
	17.	WB FREE DEC		*	804939.9	*****	804881.2	*****	*	61.	255.	AG	4230. 3.7
0.0	20.7												
	18.	WB FREE DEC		*	804881.2	*****	804756.4	*****	*	133.	249.	AG	4230. 3.7
0.0	20.7												
	19.	NB FREE DEC		*	805020.9	*****	805006.1	*****	*	75.	349.	AG	390. 4.2
0.0	17.1												
	20.	NB DEC		*	805007.9	*****	804995.3	*****	*	67.	349.	AG	2230. 2.4
0.0	17.1												
	21.	NB DEC		*	804995.3	*****	804970.8	*****	*	157.	351.	AG	2230. 2.4
0.0	17.1												
	22.	SB FREE APP		*	804949.5	*****	805003.0	*****	*	298.	170.	AG	1260. 3.6
0.0	17.1												
	23.	3 EB TO 95 SB ONRAMP*			805181.4	*****	805239.2	*****	*	58.	82.	AG	890. 2.3
0.0	9.8												
	24.	3 EB TO 95 SB ONRAMP*			805239.2	*****	805285.3	*****	*	48.	105.	AG	890. 2.3
0.0	9.8												
	25.	3 EB TO 95 SB ONRAMP*			805285.3	*****	805334.5	*****	*	56.	119.	AG	890. 2.3
0.0	9.8												
	26.	3 EB TO 95 SB ONRAMP*			805334.5	*****	805373.0	*****	*	57.	137.	AG	890. 2.3
0.0	9.8												
	27.	3 EB TO 95 SB ONRAMP*			805373.0	*****	805424.4	*****	*	114.	153.	AG	890. 2.3
0.0	9.8												
	28.	3 EB TO 95 SB ONRAMP*			805424.4	*****	805464.0	*****	*	81.	151.	AG	890. 2.3
0.0	9.8												
	29.	3 EB TO 95 SB ONRAMP*			805464.0	*****	805479.0	*****	*	60.	165.	AG	890. 2.3
0.0	9.8												
	30.	3 EB TO 95 SB ONRAMP*			805479.0	*****	805467.2	*****	*	107.	186.	AG	890. 2.3
0.0	9.8												
	31.	EB ROUTE 3		*	805192.1	*****	805545.4	*****	*	354.	85.	AG	2980. 4.2
0.0	17.1												
	32.	WB 3 TO 95 SB ONRAMP*			805530.5	*****	805459.5	*****	*	71.	272.	AG	340. 2.3
0.0	9.8												
	33.	WB 3 TO 95 SB ONRAMP*			805459.5	*****	805417.3	*****	*	49.	300.	AG	340. 2.3
0.0	9.8												
	34.	WB 3 TO 95 SB ONRAMP*			805417.3	*****	805400.7	*****	*	35.	332.	AG	340. 2.3

2040 build intersection

0.0	9.8	35.	WB 3 TO 95 SB ONRAMP*	805400.7	*****	805398.9	*****	*	33.	357.	AG	340.	2.3
0.0	9.8	36.	WB 3 TO 95 SB ONRAMP*	805398.9	*****	805411.5	*****	*	41.	18.	AG	340.	2.3
0.0	9.8	37.	WB 3 TO 95 SB ONRAMP*	805411.5	*****	805466.3	*****	*	72.	50.	AG	340.	2.3
0.0	9.8	38.	WB 3 TO 95 SB ONRAMP*	805466.3	*****	805507.6	*****	*	49.	57.	AG	340.	2.3
0.0	9.8	39.	WB 3 TO 95 SB ONRAMP*	805507.6	*****	805535.9	*****	*	28.	84.	AG	340.	2.3
0.0	9.8	40.	WB 3 TO 95 SB ONRAMP*	805535.9	*****	805566.0	*****	*	31.	102.	AG	340.	2.3
0.0	9.8	41.	WB 3 TO 95 SB ONRAMP*	805566.0	*****	805589.3	*****	*	31.	132.	AG	340.	2.3
0.0	9.8	42.	WB 3 TO 95 SB ONRAMP*	805589.3	*****	805605.5	*****	*	34.	152.	AG	340.	2.3
0.0	9.8	43.	WB 3 TO 95 SB ONRAMP*	805605.5	*****	805607.7	*****	*	36.	177.	AG	340.	2.3
0.0	9.8	44.	WB 3 TO 95 SB ONRAMP*	805607.7	*****	805595.1	*****	*	61.	192.	AG	340.	2.3

♀

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JOB: 2040 BUILD INTERSECTION

RUN:

DATE : 07/23/ 0

TIME : 08:34:35

LINK VARIABLES

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

0.0	9.8	45.	95 SB TO 3 EB OFFRAM*	805553.4	*****	805543.9	*****	*	35.	196.	AG	1020.	2.3
0.0	9.8	46.	95 SB TO 3 EB OFFRAM*	805543.9	*****	805529.6	*****	*	33.	205.	AG	1020.	2.3
0.0	9.8	47.	95 SB TO 3 EB OFFRAM*	805529.6	*****	805510.3	*****	*	30.	221.	AG	1020.	2.3
0.0	9.8	48.	95 SB TO 3 EB OFFRAM*	805510.3	*****	805477.9	*****	*	34.	251.	AG	1020.	2.3
0.0	9.8	49.	95 SB TO 3 EB OFFRAM*	805477.9	*****	805439.8	*****	*	38.	277.	AG	1020.	2.3

2040 build intersection													
0.0	9.8	50.	95 SB TO 3 EB OFFRAM*	805439.8	*****	805417.3	*****	*	27.	305.	AG	1020.	2.3
0.0	9.8	51.	95 SB TO 3 EB OFFRAM*	805417.3	*****	805392.6	*****	*	50.	330.	AG	1020.	2.3
0.0	9.8	52.	95 SB TO 3 EB OFFRAM*	805392.6	*****	805386.3	*****	*	31.	348.	AG	1020.	2.3
0.0	9.8	53.	95 SB TO 3 EB OFFRAM*	805386.3	*****	805392.6	*****	*	30.	12.	AG	1020.	2.3
0.0	9.8	54.	95 SB TO 3 EB OFFRAM*	805392.6	*****	805402.9	*****	*	22.	28.	AG	1020.	2.3
0.0	9.8	55.	95 SB TO 3 EB OFFRAM*	805402.9	*****	805429.4	*****	*	34.	52.	AG	1020.	2.3
0.0	9.8	56.	95 SB TO 3 EB OFFRAM*	805429.4	*****	805462.2	*****	*	36.	67.	AG	1020.	2.3
0.0	9.8	57.	95 SB TO 3 EB OFFRAM*	805462.2	*****	805545.7	*****	*	84.	86.	AG	1020.	2.3
0.0	20.7	58.	WB FREE APP	* 805175.3	*****	805011.3	*****	*	165.	264.	AG	5420.	2.3
0.0	13.4	59.	OFF RAMP	* 805603.0	*****	805580.2	*****	*	33.	224.	AG	1390.	2.7
0.0	13.4	60.	OFF RAMP	* 805580.2	*****	805437.5	*****	*	185.	230.	AG	1390.	2.7
0.0	13.4	61.	OFF RAMP	* 805437.5	*****	805397.6	*****	*	55.	226.	AG	1390.	2.7
0.0	13.4	62.	OFF RAMP	* 805397.6	*****	805389.1	*****	*	16.	213.	AG	1390.	2.7
0.0	17.1	63.	RAMP	* 805389.1	*****	805361.0	*****	*	112.	195.	AG	1680.	3.4
0.0	17.1	64.	RAMP	* 805361.0	*****	805337.9	*****	*	33.	225.	AG	1680.	3.4
0.0	17.1	65.	RAMP	* 805337.9	*****	805311.5	*****	*	30.	240.	AG	1680.	3.4
0.0	9.8	66.	RAMP	* 805382.9	*****	805327.4	*****	*	110.	210.	AG	390.	2.6
0.0	9.8	67.	RAMP	* 805327.4	*****	805278.9	*****	*	60.	235.	AG	390.	2.6
0.0	9.8	68.	RAMP	* 805278.9	*****	805241.3	*****	*	40.	252.	AG	390.	2.6
0.0	9.8	69.	RAMP	* 805241.3	*****	805116.2	*****	*	125.	266.	AG	390.	2.6
0.0	9.8	70.	RAMP	* 805116.2	*****	805043.5	*****	*	73.	266.	AG	390.	2.6
0.0	13.4	71.	RAMP	* 805041.6	*****	805025.1	*****	*	20.	302.	AG	1840.	4.2
0.0	13.4	72.	RAMP	* 805025.1	*****	805017.3	*****	*	16.	332.	AG	1840.	4.2
0.0	17.1	73.	WB ROUTE 3	* 805529.5	*****	805311.3	*****	*	219.	265.	AG	1955.	2.0

2040 build intersection

74. WB ROUTE 3 * 805311.3 ***** 805176.1 ***** * 136. 266. AG 3635. 2.0
 0.0 17.1

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JOB: 2040 BUILD INTERSECTION

RUN:

DATE : 07/23/ 0
 TIME : 08:34:35

 ADDITIONAL QUEUE LINK PARAMETERS

ARRIVAL	LINK DESCRIPTION	* CYCLE	RED	CLEARANCE	APPROACH	SATURATION	IDLE	SIGNAL	
		* LENGTH (SEC)	* TIME (SEC)	LOST TIME (SEC)	VOL (VPH)	FLOW RATE (VPH)	EM FAC (gm/hr)	TYPE	RATE
	1. EB RIGHT QUE	* 170	77	2.0	20	1610	4.54	2	3
	2. EB THRU QUE	* 170	77	2.0	2590	1691	4.54	2	3
	3. EB LEFT QUE	* 170	128	2.0	380	1757	4.54	2	3
	4. NB LEFT QUE	* 170	153	2.0	30	1600	4.54	2	3
	5. NB RIGHT QUE	* 170	153	2.0	50	1600	4.54	2	3
	6. WB LEFT QUE	* 170	153	2.0	50	1723	4.54	2	3
	7. WB THRU QUE	* 170	102	2.0	3920	1881	4.54	2	3
	8. SB LEFT QUE	* 170	127	2.0	1240	1810	4.54	2	3
	9. SB TRHU QUE	* 170	127	2.0	20	1900	4.54	2	3
	10. SB RIGHT QUE	* 170	127	2.0	280	1610	4.54	2	3
	11. SB RIGHT QUE	* 170	127	2.0	280	1610	4.54	2	3
	12. SB RIGHT QUE	* 170	127	2.0	280	1610	4.54	2	3

 RECEPTOR LOCATIONS

RECEPTOR	* X	COORDINATES (M) Y	Z	*
1. B01	* 804972.1	*****	1.8	*
2. B02	* 804975.0	*****	1.8	*
3. B03	* 804981.8	*****	1.8	*
4. B04	* 804975.3	*****	1.8	*
5. B05	* 804947.5	*****	1.8	*
6. B06	* 804915.3	*****	1.8	*
7. B07	* 804926.8	*****	1.8	*
8. B08	* 804941.4	*****	1.8	*
9. B09	* 804994.2	*****	1.8	*
10. B10	* 805072.4	*****	1.8	*
11. B11	* 805084.6	*****	1.8	*
12. B12	* 805103.1	*****	1.8	*

2040 build intersection

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13. B13      *      805142.8 ***** 1.8 *
14. B14      *      805111.7 ***** 1.8 *
15. B15      *      805077.1 ***** 1.8 *
16. B16      *      805034.2 ***** 1.8 *
17. B17      *      805021.0 ***** 1.8 *
18. B18      *      805013.5 ***** 1.8 *
    
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JOB: 2040 BUILD INTERSECTION

RUN:

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND * CONCENTRATION
 ANGLE * (PPM)
 (DEGR)* REC1 REC2 REC3 REC4 REC5 REC6 REC7 REC8 REC9 REC10 REC11 REC12 REC13 REC14 REC15 REC16
 REC17 REC18

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WIND ANGLE (DEGR)	CONCENTRATION (PPM)	REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18
0.	*	3.1	3.2	3.1	3.0	2.9	2.9	3.2	3.2	3.3	3.2	3.2	3.2	2.9	2.9	2.9	2.9		
2.9	3.0																		
10.	*	3.2	3.2	3.2	3.0	3.0	2.9	3.2	3.1	3.2	3.2	3.2	3.2	2.9	2.9	2.9	2.9		
2.9	2.9																		
20.	*	3.1	3.1	3.2	3.1	3.0	2.9	3.2	3.2	3.2	3.2	3.2	3.2	2.9	2.9	2.9	2.9		
2.9	2.9																		
30.	*	3.1	3.1	3.1	3.0	3.0	2.9	3.2	3.2	3.3	3.2	3.2	3.2	2.9	2.9	2.9	2.9		
2.9	2.9																		
40.	*	3.1	3.1	3.0	3.0	3.0	2.9	3.2	3.2	3.3	3.3	3.3	3.2	2.9	2.9	2.9	2.9		
2.9	2.9																		
50.	*	3.1	3.1	3.0	3.0	2.9	2.9	3.2	3.2	3.4	3.3	3.3	3.2	2.9	2.9	2.9	2.9		
2.9	2.9																		
60.	*	3.1	3.1	3.0	3.0	2.9	2.9	3.3	3.2	3.4	3.3	3.2	3.3	2.9	2.9	2.9	2.9		
2.9	2.9																		
70.	*	3.1	3.1	3.0	3.0	2.9	3.0	3.2	3.3	3.4	3.2	3.1	3.1	2.9	2.9	2.9	2.9		
2.9	2.9																		
80.	*	3.1	3.1	3.1	3.1	3.1	3.3	3.1	3.1	3.4	3.1	3.1	3.0	2.9	2.9	2.9	2.9		
2.9	2.9																		
90.	*	3.1	3.0	3.3	3.4	3.5	3.6	3.0	3.0	3.1	3.0	3.0	3.0	3.1	3.2	3.2	3.1		
3.0	2.9																		

		2040 build intersection															
100.	*	3.2	3.2	3.4	3.6	3.5	3.5	2.9	2.9	2.9	2.9	2.9	2.9	3.2	3.3	3.4	3.3
3.1	3.0																
110.	*	3.3	3.2	3.4	3.6	3.6	3.5	2.9	2.9	2.9	2.9	2.9	2.9	3.3	3.4	3.3	3.3
3.2	3.0																
120.	*	3.2	3.2	3.4	3.6	3.5	3.4	2.9	2.9	2.9	2.9	2.9	2.9	3.3	3.4	3.4	3.3
3.2	3.1																
130.	*	3.2	3.2	3.4	3.5	3.4	3.4	2.9	2.9	2.9	2.9	2.9	2.9	3.3	3.4	3.4	3.3
3.2	3.1																
140.	*	3.2	3.2	3.4	3.4	3.4	3.3	2.9	2.9	2.9	2.9	2.9	2.9	3.3	3.4	3.3	3.4
3.1	3.1																
150.	*	3.2	3.3	3.3	3.3	3.3	3.3	2.9	2.9	2.9	2.9	2.9	2.9	3.3	3.3	3.3	3.4
3.3	3.1																
160.	*	3.1	3.1	3.3	3.3	3.3	3.3	2.9	2.9	2.9	2.9	2.9	2.9	3.3	3.3	3.3	3.5
3.3	3.1																
170.	*	3.1	3.1	3.2	3.3	3.3	3.3	2.9	2.9	2.9	2.9	2.9	2.9	3.3	3.3	3.3	3.5
3.3	3.2																
180.	*	3.0	3.0	3.2	3.3	3.3	3.3	2.9	2.9	2.9	2.9	2.9	2.9	3.3	3.3	3.3	3.5
3.3	3.2																
190.	*	3.0	3.0	3.2	3.3	3.4	3.3	2.9	2.9	2.9	2.9	2.9	2.9	3.3	3.3	3.3	3.4
3.3	3.2																
200.	*	3.1	3.1	3.2	3.3	3.4	3.4	2.9	2.9	2.9	2.9	2.9	2.9	3.3	3.3	3.3	3.4
3.3	3.2																
210.	*	3.0	3.1	3.2	3.3	3.3	3.3	2.9	2.9	2.9	2.9	2.9	2.9	3.3	3.4	3.3	3.4
3.5	3.3																
220.	*	3.1	3.1	3.3	3.4	3.4	3.4	2.9	2.9	2.9	2.9	2.9	2.9	3.4	3.4	3.3	3.6
3.3	3.4																
230.	*	3.0	3.1	3.2	3.4	3.4	3.5	2.9	2.9	2.9	2.9	2.9	2.9	3.4	3.4	3.2	3.5
3.2	3.4																
240.	*	3.0	3.0	3.1	3.3	3.4	3.4	2.9	2.9	2.9	2.9	2.9	2.9	3.4	3.3	3.3	3.6
3.3	3.2																
250.	*	2.9	2.9	3.1	3.2	3.3	3.2	2.9	2.9	2.9	2.9	2.9	2.9	3.3	3.3	3.2	3.5
3.1	3.2																
260.	*	2.9	2.9	2.9	3.1	3.1	3.0	3.1	3.1	3.1	2.9	2.9	2.9	3.1	3.1	3.1	3.3
3.0	3.2																
270.	*	2.9	2.9	2.9	2.9	2.9	2.9	3.1	3.2	3.2	3.1	3.0	3.0	2.9	2.9	2.9	3.2
3.0	3.2																
280.	*	2.9	2.9	2.9	2.9	2.9	2.9	3.3	3.3	3.3	3.2	3.2	3.1	2.9	2.9	2.9	3.2
3.0	3.2																
290.	*	2.9	2.9	2.9	2.9	2.9	2.9	3.3	3.2	3.2	3.2	3.1	3.2	2.9	2.9	2.9	3.2
3.0	3.2																
300.	*	2.9	2.9	2.9	2.9	2.9	2.9	3.1	3.2	3.3	3.2	3.3	3.3	2.9	2.9	2.9	3.1
3.0	3.2																
310.	*	2.9	2.9	2.9	2.9	2.9	2.9	3.2	3.1	3.3	3.3	3.2	3.2	2.9	2.9	2.9	3.1
3.1	3.2																
320.	*	2.9	2.9	2.9	2.9	2.9	2.9	3.1	3.2	3.2	3.2	3.2	3.2	2.9	2.9	2.9	3.1
3.1	3.2																
330.	*	2.9	2.9	2.9	2.9	2.9	2.9	3.2	3.2	3.2	3.2	3.2	3.2	2.9	2.9	2.9	3.1
3.1	3.3																

2040 build intersection

340.	*	2.9	2.9	2.9	2.9	2.9	2.9	2.9	3.2	3.2	3.2	3.2	3.2	3.2	2.9	2.9	2.9	3.0
3.2	3.3																	
350.	*	3.0	3.0	3.0	3.0	2.9	2.9	3.2	3.1	3.3	3.2	3.2	3.2	3.2	2.9	2.9	2.9	2.9
3.1	3.1																	

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MAX	*	3.3	3.3	3.4	3.6	3.6	3.6	3.3	3.3	3.4	3.3	3.3	3.3	3.3	3.4	3.4	3.4	3.6
3.5	3.4																	
DEGR.	*	110	150	140	100	110	90	60	70	80	40	40	60	240	230	130	220	
210	230																	

THE HIGHEST CONCENTRATION OF 3.60 PPM OCCURRED AT RECEPTOR REC6 .

♀
 PAGE 5
 JOB: 2040 BUILD INTERSECTION

RUN:

DATE : 07/23/ 0
 TIME : 08:34:35

RECEPTOR - LINK MATRIX FOR THE ANGLE PRODUCING
 THE MAXIMUM CONCENTRATION FOR EACH RECEPTOR

		* CO/LINK (PPM)																
		* ANGLE (DEGREES)																
REC17	REC18	REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	
LINK #	*	110	150	140	100	110	90	60	70	80	40	40	60	240	230	130	220	
210	230																	

-----*

0.0	1	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																	
0.0	2	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																	
0.0	3	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																	
0.0	4	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																	
0.0	5	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																	
0.0	6	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																	
0.0	7	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																	

2040 build intersection

0.0	8 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	9 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	10 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	11 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	12 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	13 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.1	14 *	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
0.0	15 *	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.0
0.2	16 *	0.0	0.1	0.2	0.1	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
0.0	17 *	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	18 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.1	19 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	20 *	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	21 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.1	22 *	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	23 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	24 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	25 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	26 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	27 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	28 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	29 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	30 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	31 *	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0

2040 build intersection

0.0	32 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																
0.0	33 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																
0.0	34 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																
0.0	35 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																
0.0	36 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																
0.0	37 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																
0.0	38 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																
0.0	39 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																
0.0	40 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																
0.0	41 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																
0.0	42 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																
0.0	43 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																
0.0	44 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																
0.0	45 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																

♀ PAGE 6
 JOB: 2040 BUILD INTERSECTION RUN:

		CO/LINK (PPM)															
		ANGLE (DEGREES)															
REC17	REC18	REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16
LINK #	LINK #	110	150	140	100	110	90	60	70	80	40	40	60	240	230	130	220
210	230																

0.0	46 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																
0.0	47 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																
0.0	48 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0																

		2040 build intersection																	
0.0	73 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	0.0																		
0.0	74 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
	0.0																		

1

2040 build northern interchange area
CAL3QHC - (DATED 95221)

CAL3QHC PC (32 BIT) VERSION 3.0.0
(C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

Run Began on 7/25/2014 at 11:36:20

JOB: NORTHERN INTERCHANGE AREA

RUN: 2040 BUILD NORTHERN INTERCHANGE AREA

DATE : 07/25/ 0
TIME : 11:36:20

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 175. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 2.9 PPM

LINK VARIABLES

H	W	LINK DESCRIPTION V/C QUEUE (VEH)	* X1	LINK COORDINATES (M) Y1	X2	Y2	* (M)	BRG TYPE (DEG)	VPH	EF (G/MI)
0.0	17.1	1. 95 NB	* 806130.7	*****	806210.7	*****	* 184.	26. AG	3760.	2.0
0.0	17.1	2. 95 NB	* 806210.7	*****	806356.3	*****	* 275.	32. AG	3760.	2.0
0.0	17.1	3. 95 NB	* 806356.3	*****	806466.8	*****	* 186.	37. AG	3760.	2.0
0.0	17.1	4. 95 SB	* 806276.4	*****	806111.9	*****	* 319.	211. AG	4930.	0.9
0.0	17.1	5. 95 SB	* 806111.9	*****	806049.2	*****	* 158.	203. AG	4930.	0.9
0.0	17.1	6. 95 SB	* 806049.2	*****	805945.3	*****	* 314.	199. AG	4930.	0.9
0.0	17.1	7. 95 SB	* 805945.3	*****	805869.6	*****	* 270.	196. AG	4930.	0.9
0.0	13.4	8. THRU RD	* 806610.6	*****	806697.9	*****	* 133.	41. AG	570.	1.6
0.0	9.8	9. THRU RD	* 806699.5	*****	806940.1	*****	* 373.	40. AG	570.	1.1
		10. THRU RD	* 806945.0	*****	807196.3	*****	* 396.	39. AG	990.	1.2

2040 build northern interchange area

0.0	13.4											
	11.	THRU RD	*	807196.3	*****	807277.0	*****	*	134.	37. AG	990.	1.2
0.0	13.4											
	12.	THRU RD	*	807277.0	*****	807343.1	*****	*	117.	35. AG	990.	1.2
0.0	13.4											
	13.	95 NB	*	807339.8	*****	807633.5	*****	*	463.	39. AG	5430.	2.4
0.0	17.1											
	14.	95 SB	*	807601.7	*****	807237.0	*****	*	557.	221. AG	6950.	1.3
0.0	17.1											
	15.	95 SB	*	807236.2	*****	807005.4	*****	*	359.	220. AG	6950.	2.5
0.0	17.1											
	16.	95 SB	*	807005.4	*****	806635.0	*****	*	575.	220. AG	5560.	2.5
0.0	17.1											
	17.	ON RAMP	*	806663.6	*****	806708.5	*****	*	64.	135. AG	570.	2.2
0.0	9.8											
	18.	ON RAMP	*	806708.5	*****	806720.7	*****	*	31.	157. AG	570.	2.2
0.0	9.8											
	19.	ON RAMP	*	806720.7	*****	806724.0	*****	*	42.	175. AG	570.	2.2
0.0	9.8											
	20.	ON RAMP	*	806724.0	*****	806705.2	*****	*	45.	205. AG	570.	2.2
0.0	9.8											
	21.	ON RAMP	*	806705.2	*****	806675.8	*****	*	39.	230. AG	570.	2.2
0.0	9.8											
	22.	ON RAMP	*	806675.8	*****	806631.0	*****	*	45.	264. AG	570.	2.2
0.0	9.8											
	23.	ON RAMP	*	806631.0	*****	806595.1	*****	*	41.	298. AG	570.	2.2
0.0	9.8											
	24.	ON RAMP	*	806595.1	*****	806576.3	*****	*	54.	340. AG	570.	2.2
0.0	9.8											
	25.	ON RAMP	*	806576.3	*****	806586.1	*****	*	39.	15. AG	570.	2.2
0.0	9.8											
	26.	ON RAMP	*	806586.1	*****	806622.0	*****	*	67.	33. AG	570.	2.2
0.0	9.8											
	27.	ON RAMP	*	806889.5	*****	806839.0	*****	*	58.	299. AG	420.	1.4
0.0	9.8											
	28.	ON RAMP	*	806839.0	*****	806821.0	*****	*	49.	338. AG	420.	1.4
0.0	9.8											
	29.	ON RAMP	*	806821.0	*****	806888.7	*****	*	143.	28. AG	420.	1.4
0.0	9.8											
	30.	ON RAMP	*	806888.7	*****	806901.8	*****	*	96.	8. AG	420.	1.4
0.0	9.8											
	31.	ON RAMP	*	806901.8	*****	806905.0	*****	*	106.	2. AG	420.	1.4
0.0	9.8											
	32.	ON RAMP	*	806905.0	*****	806943.4	*****	*	87.	26. AG	420.	1.4
0.0	9.8											
	33.	95 NB	*	806467.8	*****	806631.8	*****	*	254.	40. AG	3760.	2.0
0.0	17.1											
	34.	95 NB	*	806631.0	*****	807197.1	*****	*	876.	40. AG	2640.	1.5

2040 build northern interchange area

0.0	17.1										
	35.	95 NB	*	807193.8	*****	807335.7	*****	*	218.	41.	AG 4440. 2.0
0.0	17.1										
	36.	95 SB	*	806631.6	*****	806565.5	*****	*	107.	218.	AG 5560. 1.3
0.0	17.1										
	37.	95 SB	*	806561.8	*****	806402.2	*****	*	247.	220.	AG 4780. 1.1
0.0	17.1										
	38.	95 SB	*	806402.2	*****	806275.2	*****	*	218.	216.	AG 4780. 1.1
0.0	17.1										
	39.	EB 17	*	806238.4	*****	806323.5	*****	*	108.	128.	AG 4920. 1.2
0.0	20.7										
	40.	EB 17	*	806321.4	*****	806583.9	*****	*	329.	127.	AG 2220. 1.7
0.0	17.1										
	41.	EB 17	*	806583.0	*****	806669.2	*****	*	110.	128.	AG 3120. 1.5
0.0	17.1										
	42.	EB 17	*	806668.0	*****	806754.2	*****	*	106.	126.	AG 2250. 1.6
0.0	17.1										
	43.	EB 17	*	806754.2	*****	806869.5	*****	*	136.	122.	AG 2250. 1.6
0.0	17.1										
	44.	EB 17	*	806869.2	*****	807123.5	*****	*	277.	113.	AG 2450. 1.4
0.0	13.4										

♀

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JOB: NORTHERN INTERCHANGE AREA

RUN: 2040 BUILD NORTHERN INTERCHANGE AREA

DATE : 07/25/ 0
 TIME : 11:36:20

LINK VARIABLES

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

0.0	13.4										
	45.	WB 17	*	807127.0	*****	806875.2	*****	*	274.	293.	AG 1330. 1.6
0.0	13.4										
	46.	WB 17	*	806875.5	*****	806671.8	*****	*	247.	304.	AG 910. 1.5
0.0	17.1										
	47.	WB 17	*	806672.7	*****	806576.3	*****	*	122.	308.	AG 910. 1.5
0.0	17.1										
	48.	WB 17	*	806576.0	*****	806317.8	*****	*	327.	308.	AG 1700. 1.3
0.0	17.1										
	49.	WB 17	*	806319.0	*****	806251.5	*****	*	86.	308.	AG 1700. 2.0
0.0	17.1										

2040 build northern interchange area

0.0	13.4	50. HOT LANE	*	807259.2	*****	807162.7	*****	*	149.	220.	AG	1680.	0.9
0.0	13.4	51. HOT LANE	*	807164.2	*****	807029.1	*****	*	207.	221.	AG	1680.	1.3
0.0	13.4	52. HOT LANE	*	807027.6	*****	806646.7	*****	*	590.	220.	AG	1680.	2.5
0.0	13.4	53. HOT LANE	*	806646.7	*****	806571.0	*****	*	117.	220.	AG	1680.	1.3
0.0	13.4	54. HOT LANE	*	806569.5	*****	806437.4	*****	*	209.	219.	AG	1680.	1.1
0.0	13.4	55. HOT LANE	*	806437.4	*****	806345.3	*****	*	154.	217.	AG	1680.	1.1
0.0	13.4	56. HOT LANE	*	806345.3	*****	806292.6	*****	*	97.	213.	AG	1680.	1.1
0.0	13.4	57. HOT LANE	*	806292.9	*****	806167.8	*****	*	248.	210.	AG	1680.	0.9
0.0	13.4	58. HOT LANE	*	806167.8	*****	806019.7	*****	*	364.	204.	AG	1680.	0.9
0.0	13.4	59. SB OFF RAMP	*	807052.5	*****	806903.4	*****	*	219.	223.	AG	1390.	2.7
0.0	13.4	60. SB OFF RAMP	*	806903.4	*****	806669.8	*****	*	361.	220.	AG	1390.	2.7
0.0	9.8	61. RAMP	*	806669.1	*****	806551.2	*****	*	182.	221.	AG	600.	1.7
0.0	9.8	62. RAMP	*	806551.2	*****	806489.4	*****	*	87.	225.	AG	600.	1.4
0.0	9.8	63. RAMP	*	806489.4	*****	806412.0	*****	*	78.	266.	AG	600.	1.4
0.0	9.8	64. RAMP	*	806412.0	*****	806368.0	*****	*	61.	314.	AG	600.	1.4
0.0	9.8	65. RAMP	*	806368.0	*****	806378.7	*****	*	70.	9.	AG	600.	1.4
0.0	9.8	66. RAMP	*	806378.7	*****	806423.4	*****	*	56.	53.	AG	600.	1.4
0.0	9.8	67. RAMP	*	806423.4	*****	806486.6	*****	*	63.	87.	AG	600.	1.4
0.0	9.8	68. RAMP	*	806486.6	*****	806563.3	*****	*	96.	127.	AG	600.	1.4
0.0	17.1	69. RAMP	*	806198.3	*****	806289.9	*****	*	183.	30.	AG	2330.	1.9
0.0	17.1	70. RAMP	*	806289.9	*****	806354.5	*****	*	101.	40.	AG	2330.	1.9
0.0	17.1	71. RAMP	*	806354.5	*****	806475.2	*****	*	146.	56.	AG	2330.	1.9
0.0	9.8	72. RAMP	*	806478.8	*****	806693.2	*****	*	232.	68.	AG	200.	1.2
0.0	9.8	73. RAMP	*	806693.2	*****	806773.5	*****	*	106.	50.	AG	200.	1.2

2040 build northern interchange area												
0.0	74.	RAMP	* 806773.5	*****	806801.2	*****	*	29.	72.	AG	200.	1.2
0.0	9.8											
0.0	75.	RAMP	* 806801.2	*****	806858.7	*****	*	60.	107.	AG	200.	1.2
0.0	9.8											
0.0	76.	RAMP	* 806475.9	*****	806647.8	*****	*	185.	68.	AG	2130.	1.8
0.0	13.4											
0.0	77.	RAMP	* 806647.8	*****	806734.4	*****	*	103.	57.	AG	2130.	1.8
0.0	13.4											
0.0	78.	RAMP	* 806734.4	*****	806777.0	*****	*	71.	37.	AG	2130.	1.8
0.0	13.4											
0.0	79.	RAMP	* 806777.0	*****	806804.0	*****	*	107.	15.	AG	2130.	1.8
0.0	13.4											
0.0	80.	RAMP	* 806804.0	*****	806781.3	*****	*	106.	348.	AG	2130.	1.8
0.0	13.4											
0.0	81.	RAMP	* 806781.3	*****	806723.0	*****	*	97.	323.	AG	2130.	1.8
0.0	13.4											
0.0	82.	RAMP	* 806723.0	*****	806652.0	*****	*	83.	301.	AG	2130.	1.8
0.0	13.4											
0.0	83.	RAMP	* 806652.0	*****	806575.4	*****	*	78.	280.	AG	2130.	1.8
0.0	13.4											
0.0	84.	RAMP	* 806575.4	*****	806454.6	*****	*	121.	266.	AG	2130.	1.8
0.0	13.4											
0.0	85.	RAMP	* 806454.6	*****	806358.1	*****	*	104.	292.	AG	2130.	1.8
0.0	13.4											
0.0	86.	RAMP	* 806358.1	*****	806261.5	*****	*	122.	308.	AG	2130.	1.8
0.0	13.4											
0.0	87.	RAMP	* 806183.4	*****	806302.7	*****	*	224.	32.	AG	770.	2.3
0.0	13.4											
0.0	88.	RAMP	* 806302.7	*****	806392.2	*****	*	156.	35.	AG	770.	2.3
0.0	13.4											
0.0	89.	RAMP	* 806392.2	*****	806498.7	*****	*	231.	28.	AG	770.	2.3
0.0	13.4											
0.0	90.	RAMP	* 806323.6	*****	806365.2	*****	*	53.	128.	AG	2700.	2.1
0.0	13.4											
0.0	91.	RAMP	* 806365.2	*****	806376.5	*****	*	44.	165.	AG	2700.	2.1
0.0	13.4											
0.0	92.	RAMP	* 806376.5	*****	806371.6	*****	*	45.	186.	AG	2700.	2.1
0.0	13.4											
0.0	93.	RAMP	* 806372.3	*****	806351.1	*****	*	78.	196.	AG	2900.	2.1
0.0	17.1											
0.0	94.	RAMP	* 806351.1	*****	806351.8	*****	*	57.	179.	AG	2900.	2.1
0.0	17.1											
0.0	95.	RAMP	* 806351.8	*****	806360.3	*****	*	107.	175.	AG	2900.	2.1
0.0	17.1											

♀

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JOB: NORTHERN INTERCHANGE AREA

RUN: 2040 BUILD NORTHERN INTERCHANGE AREA

2040 build northern interchange area

DATE : 07/25/ 0
 TIME : 11:36:20

LINK VARIABLES

H	W	LINK DESCRIPTION V/C QUEUE	* * X1	LINK COORDINATES (M) Y1	X2	Y2	* *	LENGTH (M)	BRG TYPE (DEG)	VPH	EF (G/MI)
0.0	13.4	96. RAMP	* 806363.1	*****	806353.2	*****	*	67.	189. AG	150.	1.6
0.0	13.4	97. RAMP	* 806353.2	*****	806335.6	*****	*	62.	196. AG	150.	1.6
0.0	13.4	98. RAMP	* 806335.6	*****	806270.8	*****	*	109.	216. AG	150.	1.6
0.0	13.4	99. RAMP	* 806358.2	*****	806339.1	*****	*	74.	195. AG	2950.	1.5
0.0	13.4	100. RAMP	* 806339.1	*****	806285.6	*****	*	108.	210. AG	2950.	1.5
0.0	13.4	101. RAMP	* 806285.6	*****	806232.0	*****	*	96.	214. AG	2950.	1.5
0.0	13.4	102. RAMP	* 806554.8	*****	806447.0	*****	*	160.	222. AG	780.	2.1
0.0	13.4	103. RAMP	* 806447.0	*****	806361.0	*****	*	107.	233. AG	780.	2.1
0.0	13.4	104. RAMP	* 806361.0	*****	806307.4	*****	*	83.	220. AG	780.	2.1
0.0	13.4	105. RAMP	* 806307.4	*****	806263.7	*****	*	84.	211. AG	780.	2.1
0.0	13.4	106. RAMP	* 806263.7	*****	806224.3	*****	*	90.	206. AG	780.	2.1
0.0	13.4	107. c&d lane	* 806226.4	*****	806058.6	*****	*	337.	210. AG	3730.	0.9
0.0	13.4	108. c&d lane	* 806058.6	*****	805995.2	*****	*	160.	203. AG	3730.	0.9
0.0	9.8	109. RAMP	* 806415.6	*****	806399.4	*****	*	23.	225. AG	200.	1.6
0.0	9.8	110. RAMP	* 806399.4	*****	806374.5	*****	*	46.	213. AG	200.	1.6
0.0	9.8	111. RAMP	* 806666.5	*****	806644.4	*****	*	31.	226. AG	790.	0.9
0.0	9.8	112. RAMP	* 806644.4	*****	806615.3	*****	*	33.	240. AG	790.	0.9
0.0	9.8	113. RAMP	* 806615.3	*****	806572.8	*****	*	44.	255. AG	790.	0.9

2040 build northern interchange area

0.0	9.8												
	114.	RAMP	*	806572.8	*****	806535.0	*****	*	38.	273.	AG	790.	0.9
0.0	9.8												
	115.	RAMP	*	806535.0	*****	806497.2	*****	*	41.	293.	AG	790.	0.9
0.0	9.8												
	116.	RAMP	*	806497.2	*****	806479.9	*****	*	22.	307.	AG	790.	0.9
0.0	9.8												

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PAGE 4

JOB: NORTHERN INTERCHANGE AREA

RUN: 2040 BUILD NORTHERN INTERCHANGE AREA

DATE : 07/25/ 0
 TIME : 11:36:20

 ADDITIONAL QUEUE LINK PARAMETERS

ARRIVAL	LINK DESCRIPTION	*	CYCLE	RED	CLEARANCE	APPROACH	SATURATION	IDLE	SIGNAL
		*	LENGTH	TIME	LOST TIME	VOL	FLOW RATE	EM FAC	TYPE
		*	(SEC)	(SEC)	(SEC)	(VPH)	(VPH)	(gm/hr)	RATE

-----*

 RECEPTOR LOCATIONS

RECEPTOR	*	X	COORDINATES (M)	Z	*
	*		Y		*
1. A17	*	806612.8	*****	1.8	*
2. A18	*	806860.7	*****	1.8	*
3. A19	*	806866.7	*****	1.8	*
4. A20	*	806715.6	*****	1.8	*
5. A21	*	806310.4	*****	1.8	*
6. A22	*	806306.4	*****	1.8	*

♀

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JOB: NORTHERN INTERCHANGE AREA

RUN: 2040 BUILD NORTHERN INTERCHANGE AREA

 MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

2040 build northern interchange area

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	* CONCENTRATION (PPM)	REC1	REC2	REC3	REC4	REC5	REC6
0.	*	2.9	3.0	2.9	2.9	2.9	2.9
10.	*	2.9	3.0	2.9	2.9	2.9	2.9
20.	*	2.9	2.9	2.9	2.9	2.9	2.9
30.	*	2.9	2.9	2.9	2.9	2.9	2.9
40.	*	2.9	3.0	2.9	2.9	2.9	2.9
50.	*	2.9	3.0	2.9	3.0	2.9	3.1
60.	*	2.9	3.0	2.9	3.0	2.9	3.0
70.	*	2.9	3.0	2.9	3.0	3.0	3.0
80.	*	2.9	3.0	2.9	3.0	2.9	3.0
90.	*	2.9	3.0	2.9	3.0	2.9	3.0
100.	*	2.9	3.0	2.9	3.0	2.9	3.0
110.	*	2.9	3.0	2.9	3.0	3.0	3.0
120.	*	2.9	2.9	2.9	3.0	3.0	2.9
130.	*	2.9	2.9	2.9	3.0	3.0	2.9
140.	*	2.9	2.9	2.9	3.0	3.0	2.9
150.	*	2.9	2.9	2.9	3.0	2.9	2.9
160.	*	2.9	2.9	2.9	3.0	2.9	2.9
170.	*	2.9	2.9	2.9	3.0	2.9	2.9
180.	*	2.9	2.9	2.9	3.0	2.9	2.9
190.	*	2.9	2.9	2.9	3.0	2.9	2.9
200.	*	2.9	2.9	2.9	3.0	2.9	2.9
210.	*	2.9	2.9	2.9	2.9	2.9	2.9
220.	*	2.9	2.9	2.9	2.9	2.9	2.9
230.	*	2.9	2.9	2.9	2.9	2.9	2.9
240.	*	2.9	2.9	2.9	2.9	2.9	2.9
250.	*	2.9	2.9	2.9	2.9	2.9	2.9
260.	*	2.9	2.9	2.9	2.9	2.9	2.9
270.	*	2.9	2.9	2.9	2.9	2.9	2.9
280.	*	2.9	2.9	2.9	2.9	2.9	2.9
290.	*	2.9	2.9	2.9	2.9	2.9	2.9
300.	*	2.9	2.9	2.9	2.9	2.9	2.9
310.	*	2.9	3.0	2.9	2.9	2.9	2.9
320.	*	2.9	3.0	2.9	2.9	2.9	2.9
330.	*	2.9	3.0	2.9	2.9	2.9	2.9
340.	*	2.9	3.0	2.9	2.9	2.9	2.9
350.	*	2.9	3.0	2.9	2.9	2.9	2.9
MAX	*	2.9	3.0	2.9	3.0	3.0	3.1
DEGR.	*	0	350	0	200	140	50

THE HIGHEST CONCENTRATION OF 3.10 PPM OCCURRED AT RECEPTOR REC6 .

10

2040 build northern interchange area

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JOB: NORTHERN INTERCHANGE AREA

RUN: 2040 BUILD NORTHERN INTERCHANGE AREA

DATE : 07/25/ 0

TIME : 11:36:20

RECEPTOR - LINK MATRIX FOR THE ANGLE PRODUCING
THE MAXIMUM CONCENTRATION FOR EACH RECEPTOR

LINK #	*	CO/LINK (PPM)					
		REC1	REC2	REC3	REC4	REC5	REC6
	*	0	350	0	200	140	50
1	*	0.0	0.0	0.0	0.0	0.0	0.0
2	*	0.0	0.0	0.0	0.0	0.0	0.0
3	*	0.0	0.0	0.0	0.0	0.0	0.0
4	*	0.0	0.0	0.0	0.0	0.0	0.0
5	*	0.0	0.0	0.0	0.0	0.0	0.0
6	*	0.0	0.0	0.0	0.0	0.0	0.0
7	*	0.0	0.0	0.0	0.0	0.0	0.0
8	*	0.0	0.0	0.0	0.0	0.0	0.0
9	*	0.0	0.0	0.0	0.0	0.0	0.0
10	*	0.0	0.0	0.0	0.0	0.0	0.0
11	*	0.0	0.0	0.0	0.0	0.0	0.0
12	*	0.0	0.0	0.0	0.0	0.0	0.0
13	*	0.0	0.0	0.0	0.0	0.0	0.0
14	*	0.0	0.0	0.0	0.0	0.0	0.0
15	*	0.0	0.0	0.0	0.0	0.0	0.0
16	*	0.0	0.0	0.0	0.1	0.0	0.1
17	*	0.0	0.0	0.0	0.0	0.0	0.0
18	*	0.0	0.0	0.0	0.0	0.0	0.0
19	*	0.0	0.0	0.0	0.0	0.0	0.0
20	*	0.0	0.0	0.0	0.0	0.0	0.0
21	*	0.0	0.0	0.0	0.0	0.0	0.0
22	*	0.0	0.0	0.0	0.0	0.0	0.0
23	*	0.0	0.0	0.0	0.0	0.0	0.0
24	*	0.0	0.0	0.0	0.0	0.0	0.0
25	*	0.0	0.0	0.0	0.0	0.0	0.0
26	*	0.0	0.0	0.0	0.0	0.0	0.0
27	*	0.0	0.0	0.0	0.0	0.0	0.0
28	*	0.0	0.0	0.0	0.0	0.0	0.0
29	*	0.0	0.0	0.0	0.0	0.0	0.0
30	*	0.0	0.0	0.0	0.0	0.0	0.0
31	*	0.0	0.0	0.0	0.0	0.0	0.0
32	*	0.0	0.0	0.0	0.0	0.0	0.0

2040 build northern interchange area

33	*	0.0	0.0	0.0	0.0	0.0	0.0
34	*	0.0	0.0	0.0	0.0	0.0	0.0
35	*	0.0	0.0	0.0	0.0	0.0	0.0
36	*	0.0	0.0	0.0	0.0	0.0	0.0
37	*	0.0	0.0	0.0	0.0	0.0	0.0
38	*	0.0	0.0	0.0	0.0	0.0	0.0
39	*	0.0	0.0	0.0	0.0	0.0	0.0
40	*	0.0	0.0	0.0	0.0	0.0	0.0
41	*	0.0	0.0	0.0	0.0	0.0	0.0
42	*	0.0	0.0	0.0	0.0	0.0	0.0
43	*	0.0	0.1	0.0	0.0	0.0	0.0
44	*	0.0	0.0	0.0	0.0	0.0	0.0
45	*	0.0	0.0	0.0	0.0	0.0	0.0

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JOB: NORTHERN INTERCHANGE AREA

RUN: 2040 BUILD NORTHERN INTERCHANGE AREA

LINK #	*	CO/LINK (PPM)		ANGLE (DEGREES)			
		REC1	REC2	REC3	REC4	REC5	REC6
	*	0	350	0	200	140	50
46	*	0.0	0.0	0.0	0.0	0.0	0.0
47	*	0.0	0.0	0.0	0.0	0.0	0.0
48	*	0.0	0.0	0.0	0.0	0.0	0.0
49	*	0.0	0.0	0.0	0.0	0.0	0.0
50	*	0.0	0.0	0.0	0.0	0.0	0.0
51	*	0.0	0.0	0.0	0.0	0.0	0.0
52	*	0.0	0.0	0.0	0.0	0.0	0.0
53	*	0.0	0.0	0.0	0.0	0.0	0.0
54	*	0.0	0.0	0.0	0.0	0.0	0.0
55	*	0.0	0.0	0.0	0.0	0.0	0.0
56	*	0.0	0.0	0.0	0.0	0.0	0.0
57	*	0.0	0.0	0.0	0.0	0.0	0.0
58	*	0.0	0.0	0.0	0.0	0.0	0.0
59	*	0.0	0.0	0.0	0.0	0.0	0.0
60	*	0.0	0.0	0.0	0.0	0.0	0.0
61	*	0.0	0.0	0.0	0.0	0.0	0.0
62	*	0.0	0.0	0.0	0.0	0.0	0.0
63	*	0.0	0.0	0.0	0.0	0.0	0.0
64	*	0.0	0.0	0.0	0.0	0.0	0.0
65	*	0.0	0.0	0.0	0.0	0.0	0.0
66	*	0.0	0.0	0.0	0.0	0.0	0.0
67	*	0.0	0.0	0.0	0.0	0.0	0.0
68	*	0.0	0.0	0.0	0.0	0.0	0.0
69	*	0.0	0.0	0.0	0.0	0.0	0.0
70	*	0.0	0.0	0.0	0.0	0.0	0.0

2040 build northern interchange area

71	*	0.0	0.0	0.0	0.0	0.0	0.0
72	*	0.0	0.0	0.0	0.0	0.0	0.0
73	*	0.0	0.0	0.0	0.0	0.0	0.0
74	*	0.0	0.0	0.0	0.0	0.0	0.0
75	*	0.0	0.0	0.0	0.0	0.0	0.0
76	*	0.0	0.0	0.0	0.0	0.0	0.0
77	*	0.0	0.0	0.0	0.0	0.0	0.0
78	*	0.0	0.0	0.0	0.0	0.0	0.0
79	*	0.0	0.0	0.0	0.0	0.0	0.0
80	*	0.0	0.0	0.0	0.0	0.0	0.0
81	*	0.0	0.0	0.0	0.0	0.0	0.0
82	*	0.0	0.0	0.0	0.0	0.0	0.0
83	*	0.0	0.0	0.0	0.0	0.0	0.0
84	*	0.0	0.0	0.0	0.0	0.0	0.0
85	*	0.0	0.0	0.0	0.0	0.0	0.0
86	*	0.0	0.0	0.0	0.0	0.0	0.0
87	*	0.0	0.0	0.0	0.0	0.0	0.0
88	*	0.0	0.0	0.0	0.0	0.0	0.0
89	*	0.0	0.0	0.0	0.0	0.0	0.0
90	*	0.0	0.0	0.0	0.0	0.0	0.0
91	*	0.0	0.0	0.0	0.0	0.0	0.0
92	*	0.0	0.0	0.0	0.0	0.0	0.0
93	*	0.0	0.0	0.0	0.0	0.1	0.0
94	*	0.0	0.0	0.0	0.0	0.0	0.0
95	*	0.0	0.0	0.0	0.0	0.0	0.1
96	*	0.0	0.0	0.0	0.0	0.0	0.0
97	*	0.0	0.0	0.0	0.0	0.0	0.0
98	*	0.0	0.0	0.0	0.0	0.0	0.0

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JOB: NORTHERN INTERCHANGE AREA

RUN: 2040 BUILD NORTHERN INTERCHANGE AREA

LINK #	*	CO/LINK (PPM)					
		REC1	REC2	REC3	REC4	REC5	REC6
	*	0	350	0	200	140	50
99	*	0.0	0.0	0.0	0.0	0.0	0.0
100	*	0.0	0.0	0.0	0.0	0.0	0.0
101	*	0.0	0.0	0.0	0.0	0.0	0.0
102	*	0.0	0.0	0.0	0.0	0.0	0.0
103	*	0.0	0.0	0.0	0.0	0.0	0.0
104	*	0.0	0.0	0.0	0.0	0.0	0.0
105	*	0.0	0.0	0.0	0.0	0.0	0.0
106	*	0.0	0.0	0.0	0.0	0.0	0.0
107	*	0.0	0.0	0.0	0.0	0.0	0.0
108	*	0.0	0.0	0.0	0.0	0.0	0.0

2040 build northern interchange area

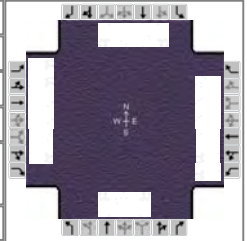
109	*	0.0	0.0	0.0	0.0	0.0	0.0
110	*	0.0	0.0	0.0	0.0	0.0	0.0
111	*	0.0	0.0	0.0	0.0	0.0	0.0
112	*	0.0	0.0	0.0	0.0	0.0	0.0
113	*	0.0	0.0	0.0	0.0	0.0	0.0
114	*	0.0	0.0	0.0	0.0	0.0	0.0
115	*	0.0	0.0	0.0	0.0	0.0	0.0
116	*	0.0	0.0	0.0	0.0	0.0	0.0



APPENDIX C
TRAFFIC SUMMARY / SYNCHRO REPORTS

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Oct 31, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{1_am} Rte 3 @ Central Pa	Analysis Year	2013 Existing Condition	Analysis Period	1> 7:00
File Name	1_2013Ex_AM.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	256	2565	52	92	1159	29	4	25	157	7	13	77

Signal Information				Signal Timing (s)													
Cycle, s	160.0	Reference Phase	2	Green	27.5	59.5	12.5	14.0	10.0	0.0	Green	27.5	59.5	12.5	14.0	10.0	0.0
Offset, s	0	Reference Point	End	Yellow	4.5	4.5	4.5	4.0	4.0	0.0	Yellow	4.5	4.5	4.5	4.0	4.0	0.0
Uncoordinated	No	Simult. Gap E/W	On	Red	3.0	3.0	3.0	3.0	3.0	0.0	Red	3.0	3.0	3.0	3.0	3.0	0.0
Force Mode	Fixed	Simult. Gap N/S	On														

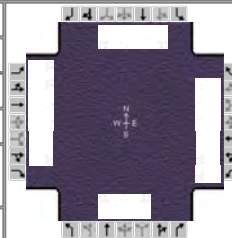
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	4.0		9.0		9.0
Phase Duration, s	35.0	102.0	20.0	87.0		21.0		17.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.0		3.0
Queue Clearance Time (g _s), s	13.4		6.2			16.9		9.2
Green Extension Time (g _e), s	0.4	0.0	1.9	0.0		0.0		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.00		0.31			1.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	267	2672	49	96	932	306	4	26	147	7	14	72
Adjusted Saturation Flow Rate (s), veh/h/ln	1740	1691	1594	1658	1810	1778	1810	1845	1563	1757	1696	1548
Queue Service Time (g _s), s	11.4	0.0	0.0	4.2	5.6	6.9	0.3	2.1	14.9	0.6	0.6	7.2
Cycle Queue Clearance Time (g _c), s	11.4	0.0	0.0	4.2	5.6	6.9	0.3	2.1	14.9	0.6	0.6	7.2
Green Ratio (g/C)	0.18	0.61	0.61	0.09	0.51	0.51	0.10	0.10	0.10	0.08	0.08	0.08
Capacity (c), veh/h	631	3076	967	290	2782	883	181	184	156	132	254	116
Volume-to-Capacity Ratio (X)	0.423	0.869	0.051	0.330	0.335	0.346	0.023	0.141	0.940	0.055	0.053	0.619
Available Capacity (c _a), veh/h	631	3076	967	290	2782	883	181	184	156	132	254	116
Back of Queue (Q), veh/ln (50th percentile)	5.2	1.0	0.0	1.8	1.9	2.5	0.2	1.0	8.3	0.3	0.3	3.1
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	62.6	0.0	0.0	66.4	6.3	7.7	64.9	65.7	71.5	68.7	68.7	71.8
Incremental Delay (d ₂), s/veh	0.2	3.6	0.1	0.2	0.3	1.0	0.0	0.1	53.6	0.1	0.0	7.2
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	62.7	3.6	0.1	66.6	6.6	8.7	65.0	65.9	125.1	68.8	68.8	79.0
Level of Service (LOS)	E	A	A	E	A	A	E	E	F	E	E	E
Approach Delay, s/veh / LOS	8.9	A		11.4	B		115.0	F			76.7	E
Intersection Delay, s/veh / LOS	15.1						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.9	C	3.0	C	3.5	D	3.8	D
Bicycle LOS Score / LOS	2.1	B	1.0	A	0.8	A	0.6	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Oct 17, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{1_pm} Rte 3 @ Central Pa	Analysis Year	2013 Existing Condition	Analysis Period	1> 7:00
File Name	1_2013Ex_PM.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	313	1603	103	485	2334	66	80	99	394	97	180	362

Signal Information				Signal Phases											
Cycle, s	170.0	Reference Phase	2												
Offset, s	0	Reference Point	End	Green	25.5	42.5	33.5	14.0	18.0	0.0					
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.5	4.5	4.5	4.0	4.0	0.0					
Force Mode	Fixed	Simult. Gap N/S	On	Red	3.0	3.0	3.0	3.0	3.0	0.0					

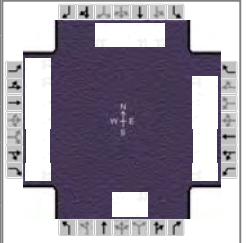
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	4.0		9.0		9.0
Phase Duration, s	33.0	83.0	41.0	91.0		21.0		25.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.0		3.0
Queue Clearance Time (g _s), s	16.6		23.9			18.0		22.0
Green Extension Time (g _e), s	0.4	0.0	5.6	0.0		0.0		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.00		0.55			1.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	326	1670	97	505	1884	616	83	103	370	101	188	340
Adjusted Saturation Flow Rate (s), veh/h/ln	1757	1675	1594	1757	1863	1826	1810	1900	1610	1792	1900	1610
Queue Service Time (g _s), s	14.6	53.8	8.9	21.9	20.5	24.3	7.4	8.8	16.0	9.0	7.8	20.0
Cycle Queue Clearance Time (g _c), s	14.6	53.8	8.9	21.9	20.5	24.3	7.4	8.8	16.0	9.0	7.8	20.0
Green Ratio (g/C)	0.16	0.46	0.46	0.21	0.51	0.51	0.09	0.09	0.09	0.12	0.12	0.12
Capacity (c), veh/h	558	2306	731	723	2827	897	170	179	152	211	447	189
Volume-to-Capacity Ratio (X)	0.584	0.724	0.132	0.698	0.666	0.687	0.489	0.577	2.440	0.479	0.419	1.793
Available Capacity (c _a), veh/h	558	2306	731	723	2827	897	170	179	152	211	447	189
Back of Queue (Q), veh/ln (50th percentile)	6.7	24.9	3.9	9.6	4.7	6.7	3.5	4.5	34.8	4.2	3.8	28.2
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	66.3	62.9	42.7	56.9	8.5	10.6	73.1	73.8	77.0	70.1	69.6	75.0
Incremental Delay (d ₂), s/veh	1.1	2.0	0.4	1.2	0.6	2.1	0.8	3.0	667.6	0.6	0.2	377.0
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	67.4	64.9	43.1	58.2	9.1	12.7	73.9	76.7	744.6	70.8	69.8	452.0
Level of Service (LOS)	E	E	D	E	A	B	E	E	F	E	E	F
Approach Delay, s/veh / LOS	64.3	E		18.1	B		520.3	F			276.6	F
Intersection Delay, s/veh / LOS	103.8						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.9	C	3.0	C	3.5	D	3.8	D
Bicycle LOS Score / LOS	1.6	A	1.7	A	1.4	A	1.0	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Oct 17, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{2_} Rte 3 @ Carl D Silv	Analysis Year	2013 Existing Condition	Analysis Period	1> 7:00
File Name	2_2013Ex_AM.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	144	2875	12	21	1094	455	12	7	18	351	7	55

Signal Information				Signal Timing (s)										
Cycle, s	160.0	Reference Phase	2	Green	24.5	50.5	9.5	10.0	29.0	0.0	1	2	3	4
Offset, s	0	Reference Point	End	Yellow	4.5	4.5	4.5	4.0	4.0	0.0	5	6	7	8
Uncoordinated	No	Simult. Gap E/W	On	Red	3.0	3.0	3.0	3.0	3.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On											

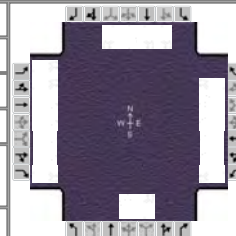
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	3.0		11.0		9.0
Phase Duration, s	32.0	90.0	17.0	75.0		17.0		36.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.1		2.8
Queue Clearance Time (g _s), s	8.3		3.8			3.7		16.8
Green Extension Time (g _e), s	0.2	0.0	2.2	0.0		0.0		0.7
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.00		0.48			0.00		0.00

Movement Group Results	EB			WB			NB			SB			
	L	T	R	L	T	R	L	T	R	L	T	R	
Approach Movement													
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14	
Adjusted Flow Rate (v), veh/h	150	2995	11	22	1140	474		20	17	366	7	51	
Adjusted Saturation Flow Rate (s), veh/h/ln	1757	1708	1533	1774	1827	1579		1842	1464	1774	1900	1610	
Queue Service Time (g _s), s	6.3	49.2	0.8	1.8	16.6	38.6		1.6	1.7	14.8	0.5	4.2	
Cycle Queue Clearance Time (g _c), s	6.3	49.2	0.8	1.8	16.6	38.6		1.6	1.7	14.8	0.5	4.2	
Green Ratio (g/C)	0.16	0.53	0.53	0.08	0.44	0.44		0.08	0.08	0.20	0.20	0.20	
Capacity (c), veh/h	571	3630	815	133	3197	691		138	110	699	374	317	
Volume-to-Capacity Ratio (X)	0.263	0.825	0.014	0.164	0.356	0.686		0.143	0.152	0.523	0.019	0.161	
Available Capacity (c _a), veh/h	571	3630	815	133	3197	691		115	110	699	374	317	
Back of Queue (Q), veh/ln (50th percentile)	2.9	17.0	0.3	0.9	7.5	16.0		0.8	0.7	6.7	0.2	1.7	
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	
Uniform Delay (d ₁), s/veh	62.5	18.8	24.5	69.3	30.7	36.2		70.7	69.2	57.5	51.8	53.3	
Incremental Delay (d ₂), s/veh	0.1	2.3	0.0	0.2	0.3	5.5		0.2	0.2	0.3	0.0	0.1	
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	62.6	21.1	24.5	69.5	31.0	41.7		70.9	69.5	57.9	51.8	53.4	
Level of Service (LOS)	E	C	C	E	C	D		E	E	E	D	D	
Approach Delay, s/veh / LOS	23.1		C	34.6		C		70.2		E	57.2		E
Intersection Delay, s/veh / LOS	29.7						C						

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	3.0	C	3.8	D	3.9	D
Bicycle LOS Score / LOS	1.8	A	1.2	A	0.5	A	1.2	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Oct 17, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{2_pm} Rte 3 @ Carl D Silv	Analysis Year	2013 Existing Condition	Analysis Period	1> 7:00
File Name	2_2013Ex_PM.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	273	1839	11	37	2715	935	21	10	26	848	13	303

Signal Information				Signal Phases										
Cycle, s	170.0	Reference Phase	2											
Offset, s	0	Reference Point	End	Green	34.5	43.5	9.5	10.0	36.0	0.0	1	2	3	4
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.5	4.5	4.5	4.0	4.0	0.0	5	6	7	8
Force Mode	Fixed	Simult. Gap N/S	On	Red	3.0	3.0	3.0	3.0	3.0	0.0				

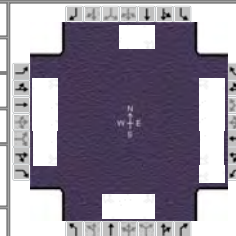
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	3.0		11.0		9.0
Phase Duration, s	42.0	93.0	17.0	68.0		17.0		43.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.1		2.9
Queue Clearance Time (g _s), s	14.5		5.6			5.0		40.5
Green Extension Time (g _e), s	0.5	0.0	3.4	0.0		0.0		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.00		0.96			0.04		1.00

Movement Group Results	EB			WB			NB			SB			
	L	T	R	L	T	R	L	T	R	L	T	R	
Approach Movement													
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14	
Adjusted Flow Rate (v), veh/h	284	1916	10	39	2828	974		32	24	883	14	284	
Adjusted Saturation Flow Rate (s), veh/h/ln	1757	1691	1610	1723	1881	1610		1767	1579	1810	1900	1610	
Queue Service Time (g _s), s	12.5	12.5	0.2	3.6	63.0	63.0		3.0	2.4	38.5	0.9	28.2	
Cycle Queue Clearance Time (g _c), s	12.5	12.5	0.2	3.6	63.0	63.0		3.0	2.4	38.5	0.9	28.2	
Green Ratio (g/C)	0.21	0.52	0.52	0.07	0.37	0.37		0.07	0.07	0.23	0.23	0.23	
Capacity (c), veh/h	744	3502	833	122	2789	597		125	111	820	430	365	
Volume-to-Capacity Ratio (X)	0.382	0.547	0.012	0.317	1.014	1.632		0.259	0.215	1.078	0.031	0.780	
Available Capacity (c _a), veh/h	744	3502	833	122	2789	597		104	111	820	430	365	
Back of Queue (Q), veh/ln (50th percentile)	5.8	3.1	0.1	1.6	33.7	73.8		1.4	1.0	24.0	0.5	12.6	
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	
Uniform Delay (d ₁), s/veh	62.9	6.7	5.6	75.1	53.5	53.5		76.4	74.6	65.8	51.2	61.8	
Incremental Delay (d ₂), s/veh	0.1	0.6	0.0	0.5	20.6	292.1		0.4	0.4	54.5	0.0	9.5	
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	63.0	7.3	5.7	75.7	74.1	345.6		76.8	74.9	120.3	51.2	71.3	
Level of Service (LOS)	E	A	A	E	F	F		E	E	F	D	E	
Approach Delay, s/veh / LOS	14.5		B	143.0		F		76.0		E	107.7		F
Intersection Delay, s/veh / LOS	97.8						F						

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	3.0	C	3.8	D	3.9	D
Bicycle LOS Score / LOS	1.4	A	2.1	B	0.6	A	2.4	B

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Oct 17, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{3_} Rte 3 @ Gateway E	Analysis Year	2013 Existing Condition	Analysis Period	1> 7:00
File Name	3_2013Ex_AM.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	33	1310	331	107	1388	9	239	10	109	10	3	23

Signal Information				Signal Timing (s)										
Cycle, s	114.0	Reference Phase	2	Green	10.0	31.5	10.0	19.5	7.5	0.0	1	2	3	4
Offset, s	0	Reference Point	End	Yellow	4.0	3.5	4.0	4.5	4.5	0.0	5	6	7	8
Uncoordinated	No	Simult. Gap E/W	On	Red	3.0	3.0	3.0	3.0	3.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On											

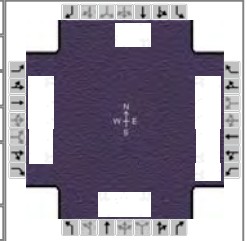
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	3.0		9.0		10.0
Phase Duration, s	17.0	55.0	17.0	55.0		27.0		15.0
Change Period, (Y+R _c), s	7.0	6.5	7.0	7.0		7.5		7.5
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		2.9		3.2
Queue Clearance Time (g _s), s	4.0		5.4			17.0		3.8
Green Extension Time (g _e), s	0.0	0.0	2.0	0.0		0.2		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.00		0.60			1.00		0.42

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	34	1365	310	111	1446	8	249	10	102	10	27	
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1675	1533	1706	1597	1610	1792	1900	1533	1691	1639	
Queue Service Time (g _s), s	2.0	23.1	15.7	3.4	8.4	0.1	15.0	0.5	6.6	0.7	1.8	
Cycle Queue Clearance Time (g _c), s	2.0	23.1	15.7	3.4	8.4	0.1	15.0	0.5	6.6	0.7	1.8	
Green Ratio (g/C)	0.10	0.46	0.46	0.10	0.45	0.45	0.18	0.18	0.18	0.08	0.08	
Capacity (c), veh/h	183	2292	699	344	2165	727	330	350	282	134	108	
Volume-to-Capacity Ratio (X)	0.188	0.595	0.444	0.324	0.668	0.011	0.754	0.030	0.361	0.078	0.251	
Available Capacity (c _a), veh/h	183	2292	699	344	2165	727	330	350	282	134	108	
Back of Queue (Q), veh/ln (50th percentile)	0.9	9.2	6.0	1.4	1.6	0.0	7.4	0.2	2.5	0.3	0.7	
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Uniform Delay (d ₁), s/veh	47.0	24.3	21.1	45.8	3.6	3.0	44.1	38.1	40.6	48.7	49.8	
Incremental Delay (d ₂), s/veh	0.2	1.1	2.0	0.2	1.7	0.0	8.5	0.0	0.3	0.1	0.4	
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	47.2	25.4	23.2	46.0	5.3	3.0	52.6	38.2	40.9	48.7	50.2	
Level of Service (LOS)	D	C	C	D	A	A	D	D	D	D	D	
Approach Delay, s/veh / LOS	25.4	C		8.2	A		48.9	D			49.8	D
Intersection Delay, s/veh / LOS	20.6						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.9	C	2.3	B	3.5	D	3.4	C
Bicycle LOS Score / LOS	1.4	A	1.3	A	1.1	A	0.5	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Oct 17, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{3_} Rte 3 @ Gateway E	Analysis Year	2013 Existing Condition	Analysis Period	1> 7:00
File Name	3_2013Ex_PM.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	31	1506	455	228	1396	0	308	2	217	10	1	3

Signal Information				Signal Phases									
Cycle, s	114.0	Reference Phase	2										
Offset, s	0	Reference Point	End	Green	10.0	31.5	10.0	19.5	7.5	0.0			
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.0	3.5	4.0	4.5	4.5	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Red	3.0	3.0	3.0	3.0	3.0	0.0			

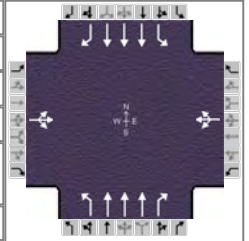
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	3.0		9.0		10.0
Phase Duration, s	17.0	55.0	17.0	55.0		27.0		15.0
Change Period, (Y+R _c), s	7.0	6.5	7.0	7.0		7.5		7.5
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		2.9		3.0
Queue Clearance Time (g _s), s	3.9		9.6			22.3		2.7
Green Extension Time (g _e), s	0.0	0.0	0.3	0.0		0.0		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.00		1.00			1.00		0.01

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	32	1569	440	238	1454	0	321	2	215	10	4	
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1675	1533	1706	1597	1610	1792	1900	1533	1691	1674	
Queue Service Time (g _s), s	1.9	28.1	24.9	7.6	8.5	0.0	20.3	0.1	15.1	0.7	0.3	
Cycle Queue Clearance Time (g _c), s	1.9	28.1	24.9	7.6	8.5	0.0	20.3	0.1	15.1	0.7	0.3	
Green Ratio (g/C)	0.10	0.46	0.46	0.10	0.45	0.45	0.18	0.18	0.18	0.08	0.08	
Capacity (c), veh/h	183	2292	699	344	2165	727	330	350	282	134	110	
Volume-to-Capacity Ratio (X)	0.177	0.684	0.628	0.690	0.672	0.000	0.972	0.006	0.760	0.078	0.038	
Available Capacity (c _a), veh/h	183	2292	699	344	2165	727	330	350	282	134	110	
Back of Queue (Q), veh/ln (50th percentile)	0.8	11.3	9.7	3.4	1.6	0.0	12.8	0.0	6.5	0.3	0.1	
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Uniform Delay (d ₁), s/veh	46.9	25.7	23.6	47.6	3.6	0.0	46.2	38.0	44.1	48.7	49.0	
Incremental Delay (d ₂), s/veh	0.2	1.7	4.2	4.8	1.7	0.0	41.7	0.0	10.3	0.1	0.1	
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	47.1	27.4	27.9	52.5	5.3	0.0	87.9	38.0	54.4	48.7	49.0	
Level of Service (LOS)	D	C	C	D	A		F	D	D	D	D	
Approach Delay, s/veh / LOS	27.8	C		11.9	B		74.3	E		48.8	D	
Intersection Delay, s/veh / LOS	27.5						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.9	C	2.3	B	3.5	D	3.4	C
Bicycle LOS Score / LOS	1.6	A	1.4	A	1.4	A	0.5	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Oct 17, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{4_am} Rte 17 @ McLane I	Analysis Year	2013 Existing Condition	Analysis Period	1> 7:00
File Name	4_2013Ex_AM.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	17	8	6	32	1	12	15	2190	33	26	1770	25

Signal Information														
Cycle, s	130.0	Reference Phase	2											
Offset, s	0	Reference Point	End											
Uncoordinated	No	Simult. Gap E/W	On	Green	10.5	60.5	38.5	0.0	0.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.5	4.5	3.5	0.0	0.0	0.0				
				Red	3.0	3.0	3.0	0.0	0.0	0.0				

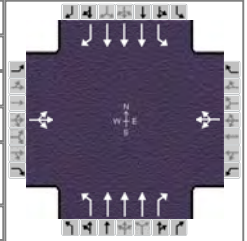
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		8.0		8.0	2.0	3.0	2.0	3.0
Phase Duration, s		45.0		45.0	17.0	68.0	17.0	68.0
Change Period, (Y+R _c), s		6.5		6.5	6.5	7.5	6.5	7.5
Max Allow Headway (MAH), s		3.2		3.2	2.8	0.0	2.8	0.0
Queue Clearance Time (g _s), s		3.7		4.7	3.1		3.8	
Green Extension Time (g _e), s		0.1		0.1	0.0	0.0	0.0	0.0
Phase Call Probability		1.00		1.00	1.00		1.00	
Max Out Probability		0.00		0.00	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	32			47			16	2281	31	27	1844	24
Adjusted Saturation Flow Rate (s), veh/h/ln	1519			1435			1740	1659	1548	1740	1659	1548
Queue Service Time (g _s), s	0.0			1.0			1.1	48.6	0.1	1.8	39.4	1.1
Cycle Queue Clearance Time (g _c), s	1.7			2.7			1.1	48.6	0.1	1.8	39.4	1.1
Green Ratio (g/C)	0.32			0.32			0.09	0.48	0.48	0.10	0.48	0.48
Capacity (c), veh/h	493			472			161	2412	750	174	2412	750
Volume-to-Capacity Ratio (X)	0.066			0.099			0.097	0.946	0.042	0.156	0.764	0.032
Available Capacity (c _a), veh/h	493			472			161	2412	750	174	2412	750
Back of Queue (Q), veh/ln (50th percentile)	0.7			1.1			0.5	8.9	0.1	0.8	15.9	0.4
Queue Storage Ratio (RQ) (50th percentile)	0.00			0.00			0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	32.6			33.1			54.0	12.1	1.0	53.5	28.3	17.5
Incremental Delay (d ₂), s/veh	0.0			0.0			0.1	9.4	0.1	0.2	2.4	0.1
Initial Queue Delay (d ₃), s/veh	0.0			0.0			0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	32.6			33.1			54.1	21.5	1.1	53.6	30.7	17.6
Level of Service (LOS)	C			C			D	C	A	D	C	B
Approach Delay, s/veh / LOS	32.6	C		33.1	C		21.4	C		30.9	C	
Intersection Delay, s/veh / LOS	25.8						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.4	C	3.4	C	2.1	B	2.1	B
Bicycle LOS Score / LOS	0.5	A	0.6	A	1.8	A	1.5	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Oct 17, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{4_pm} Rte 17 @ McLane I	Analysis Year	2013 Existing Condition	Analysis Period	1> 7:00
File Name	4_2013Ex_PM.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	9	1	7	38	4	17	9	1856	15	10	2321	20

Signal Information													
Cycle, s	160.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On	Green	10.5	90.5	38.5	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.5	4.5	3.5	0.0	0.0	0.0			
				Red	3.0	3.0	3.0	0.0	0.0	0.0			

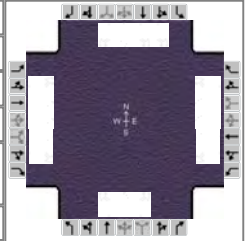
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		8.0		8.0	2.0	3.0	2.0	3.0
Phase Duration, s		45.0		45.0	17.0	98.0	17.0	98.0
Change Period, (Y+R _c), s		6.5		6.5	6.5	7.5	6.5	7.5
Max Allow Headway (MAH), s		3.2		3.2	2.8	0.0	2.8	0.0
Queue Clearance Time (g _s), s		3.3		7.1	2.8		2.9	
Green Extension Time (g _e), s		0.1		0.1	0.0	0.0	0.0	0.0
Phase Call Probability		1.00		1.00	1.00		1.00	
Max Out Probability		0.00		0.00	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	18			61			9	1933	13	10	2418	19
Adjusted Saturation Flow Rate (s), veh/h/ln	1477			1455			1740	1659	1548	1740	1659	1548
Queue Service Time (g _s), s	0.0			3.8			0.8	5.5	0.0	0.9	63.3	0.8
Cycle Queue Clearance Time (g _c), s	1.3			5.1			0.8	5.5	0.0	0.9	63.3	0.8
Green Ratio (g/C)	0.26			0.26			0.08	0.58	0.58	0.08	0.58	0.58
Capacity (c), veh/h	390			387			130	2893	900	141	2893	900
Volume-to-Capacity Ratio (X)	0.045			0.159			0.072	0.668	0.014	0.074	0.836	0.021
Available Capacity (c _a), veh/h	390			387			130	2893	900	141	2893	900
Back of Queue (Q), veh/ln (50th percentile)	0.6			2.0			0.4	1.1	0.0	0.4	25.4	0.3
Queue Storage Ratio (RQ) (50th percentile)	0.00			0.00			0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	46.6			47.9			68.8	1.2	0.0	67.9	28.2	14.2
Incremental Delay (d ₂), s/veh	0.0			0.1			0.1	1.2	0.0	0.1	3.0	0.0
Initial Queue Delay (d ₃), s/veh	0.0			0.0			0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	46.6			48.0			68.9	2.4	0.0	68.0	31.2	14.2
Level of Service (LOS)	D			D			E	A	A	E	C	B
Approach Delay, s/veh / LOS	46.6		D	48.0		D	2.7		A	31.2		C
Intersection Delay, s/veh / LOS	19.1						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.4	C	3.4	C	2.1	B	2.1	B
Bicycle LOS Score / LOS	0.5	A	0.6	A	1.6	A	1.8	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Oct 17, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{5_} Rte 17 @ Sanford I	Analysis Year	2013 Existing Condition	Analysis Period	1> 7:00
File Name	5_2013Ex_AM.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	11	1807	20	192	2208	213	52	5	141	144	61	15

Signal Information													
Cycle, s	130.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On	Green	23.5	39.5	9.5	11.0	10.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.5	4.5	4.5	4.0	4.0	0.0			
				Red	3.0	3.0	3.0	3.0	3.0	0.0			

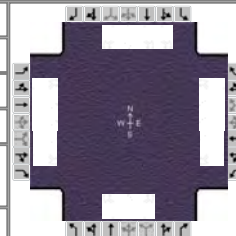
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	3.0		9.0		9.0
Phase Duration, s	17.0	64.0	31.0	78.0		18.0		17.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.0		2.9
Queue Clearance Time (g _s), s	2.8		15.6			12.0		7.5
Green Extension Time (g _e), s	3.1	0.0	0.2	0.0		0.0		0.1
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.46		0.00			1.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	11	1882	19	200	2300	206	54	5	122	150	64	14
Adjusted Saturation Flow Rate (s), veh/h/ln	1740	1659	1548	1740	1659	1548	1740	1827	1548	1689	1827	1548
Queue Service Time (g _s), s	0.8	44.7	0.9	13.6	51.1	8.8	3.8	0.3	10.0	5.5	4.2	1.1
Cycle Queue Clearance Time (g _c), s	0.8	44.7	0.9	13.6	51.1	8.8	3.8	0.3	10.0	5.5	4.2	1.1
Green Ratio (g/C)	0.07	0.43	0.43	0.20	0.54	0.54	0.10	0.10	0.10	0.10	0.10	0.10
Capacity (c), veh/h	127	2163	673	341	2699	863	147	183	155	312	176	119
Volume-to-Capacity Ratio (X)	0.090	0.870	0.028	0.586	0.852	0.239	0.368	0.029	0.787	0.481	0.362	0.114
Available Capacity (c _a), veh/h	127	2163	673	341	2699	863	147	183	155	312	176	119
Back of Queue (Q), veh/ln (50th percentile)	0.4	18.7	0.3	6.6	20.3	3.3	2.0	0.2	5.3	2.6	2.2	0.5
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	56.2	33.4	21.0	47.5	25.3	14.7	56.2	53.7	57.1	56.0	55.2	55.9
Incremental Delay (d ₂), s/veh	1.4	5.1	0.1	7.2	3.6	0.7	6.9	0.3	32.2	5.2	5.7	1.9
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	57.6	38.5	21.1	54.6	29.0	15.3	63.2	54.0	89.3	61.3	60.9	57.8
Level of Service (LOS)	E	D	C	D	C	B	E	D	F	E	E	E
Approach Delay, s/veh / LOS	38.5	D		29.8	C		80.5	F			61.0	E
Intersection Delay, s/veh / LOS	36.4						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.5	B	2.6	B	3.4	C	3.4	C
Bicycle LOS Score / LOS	1.5	A	2.0	A	0.8	A	0.9	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Oct 17, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{5_pm} Rte 17 @ Sanford I	Analysis Year	2013 Existing Condition	Analysis Period	1> 7:00
File Name	5_2013Ex_PM.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	6	2255	44	224	1807	181	32	4	580	317	19	6

Signal Information				Signal Timing (s)								Signal Phases			
Cycle, s	160.0	Reference Phase	2	Green	28.5	45.5	22.5	6.0	21.0	0.0	1	2	3	4	
Offset, s	0	Reference Point	End	Yellow	4.5	4.5	4.5	4.0	4.0	0.0	5	6	7	8	
Uncoordinated	No	Simult. Gap E/W	On	Red	3.0	3.0	3.0	3.0	3.0	0.0					
Force Mode	Fixed	Simult. Gap N/S	On												

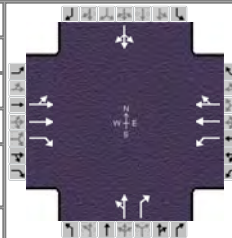
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	3.0		9.0		9.0
Phase Duration, s	30.0	83.0	36.0	89.0		13.0		28.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.0		2.8
Queue Clearance Time (g _s), s	2.5		22.1			10.0		16.8
Green Extension Time (g _e), s	7.1	0.0	0.2	0.0		0.0		0.3
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.11		0.02			1.00		0.27

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	6	2349	42	233	1882	180	33	4	518	330	20	5
Adjusted Saturation Flow Rate (s), veh/h/ln	1740	1659	1548	1740	1659	1548	1740	1827	1548	1689	1827	1548
Queue Service Time (g _s), s	0.5	75.5	2.3	20.1	47.8	10.1	3.0	0.3	8.0	14.8	1.5	0.5
Cycle Queue Clearance Time (g _c), s	0.5	75.5	2.3	20.1	47.8	10.1	3.0	0.3	8.0	14.8	1.5	0.5
Green Ratio (g/C)	0.14	0.47	0.47	0.19	0.51	0.51	0.05	0.05	0.05	0.15	0.15	0.15
Capacity (c), veh/h	245	2348	731	332	2535	808	65	91	77	486	268	203
Volume-to-Capacity Ratio (X)	0.026	1.000	0.057	0.704	0.743	0.223	0.511	0.046	6.688	0.680	0.074	0.026
Available Capacity (c _a), veh/h	245	2348	731	332	2535	808	65	91	77	486	268	203
Back of Queue (Q), veh/ln (50th percentile)	0.2	34.6	0.9	10.0	19.6	3.9	1.8	0.2	58.8	6.9	0.7	0.2
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	59.3	42.3	22.9	60.5	31.0	20.7	75.6	73.3	76.0	65.0	59.1	60.6
Incremental Delay (d ₂), s/veh	0.2	18.6	0.1	11.8	2.0	0.6	25.8	0.9	2586.5	7.5	0.5	0.2
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	59.5	60.9	23.1	72.4	33.0	21.3	101.4	74.3	2662.5	72.5	59.6	60.8
Level of Service (LOS)	E	F	C	E	C	C	F	E	F	E	E	E
Approach Delay, s/veh / LOS	60.2		E	36.1		D	2489.3		F	71.6		E
Intersection Delay, s/veh / LOS	291.7						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.6	B	2.6	B	3.4	C	3.4	C
Bicycle LOS Score / LOS	1.8	A	1.8	A	1.4	A	1.1	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Oct 17, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{6_am} Rte 17 @ Short St	Analysis Year	2013 Existing Condition	Analysis Period	1> 7:00
File Name	6_2013Ex_AM.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	8	1052	52	14	1113	1	88	0	11	2	0	12

Signal Information														
Cycle, s	100.0	Reference Phase	2											
Offset, s	0	Reference Point	End											
Uncoordinated	No	Simult. Gap E/W	On	Green	10.0	32.5	19.0	10.0	0.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.5	4.0	4.0	0.0	0.0				
				Red	3.0	3.0	3.0	3.0	0.0	0.0				

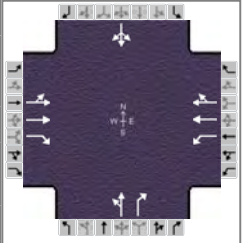
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6		8		4
Case Number		7.3	1.0	4.0		11.0		12.0
Phase Duration, s		40.0	17.0	57.0		26.0		17.0
Change Period, (Y+R _c), s		7.5	7.0	7.5		7.0		7.0
Max Allow Headway (MAH), s		0.0	2.8	0.0		3.1		3.3
Queue Clearance Time (g _s), s			2.4			6.3		2.8
Green Extension Time (g _e), s		0.0	0.0	0.0		0.1		0.0
Phase Call Probability			1.00			1.00		1.00
Max Out Probability			0.00			0.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	575	529	49	15	580	580		92	10		15	
Adjusted Saturation Flow Rate (s), veh/h/ln	1821	1679	1579	1810	1863	1862		1810	1563		1636	
Queue Service Time (g _s), s	9.2	29.9	2.1	0.4	21.7	21.7		4.3	0.5		0.8	
Cycle Queue Clearance Time (g _c), s	31.0	29.9	2.1	0.4	21.7	21.7		4.3	0.5		0.8	
Green Ratio (g/C)	0.35	0.35	0.35	0.48	0.52	0.52		0.21	0.21		0.12	
Capacity (c), veh/h	628	588	553	301	969	922		380	328		196	
Volume-to-Capacity Ratio (X)	0.915	0.901	0.089	0.048	0.599	0.629		0.241	0.032		0.074	
Available Capacity (c _a), veh/h	628	588	553	301	969	922		344	328		164	
Back of Queue (Q), veh/ln (50th percentile)	16.5	14.9	0.8	0.2	9.5	9.6		1.9	0.2		0.3	
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		0.00	
Uniform Delay (d ₁), s/veh	31.9	30.9	21.8	19.1	17.5	16.7		34.6	31.4		40.9	
Incremental Delay (d ₂), s/veh	20.2	19.4	0.3	0.0	2.7	3.3		0.1	0.0		0.1	
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Control Delay (d), s/veh	52.1	50.3	22.1	19.2	20.2	20.0		34.7	31.4		40.9	
Level of Service (LOS)	D	D	C	B	C	B		C	C		D	
Approach Delay, s/veh / LOS	50.0	D		20.1	C		34.3	C		40.9	D	
Intersection Delay, s/veh / LOS	34.9						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.1	B	2.9	C	2.9	C
Bicycle LOS Score / LOS	1.4	A	1.5	A	0.7	A	0.5	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Oct 17, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{6_pm} Rte 17 @ Short St	Analysis Year	2013 Existing Condition	Analysis Period	1> 7:00
File Name	6_2013Ex_PM.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	5	1789	77	11	984	1	72	2	26	2	1	7

Signal Information												
Cycle, s	110.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On	Green	11.0	43.5	16.0	11.0	0.0	0.0		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.5	4.0	4.0	0.0	0.0		
				Red	3.0	3.0	3.0	3.0	0.0	0.0		

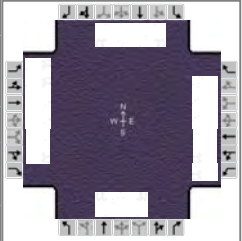
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6		8		4
Case Number		7.3	1.0	4.0		11.0		12.0
Phase Duration, s		51.0	18.0	69.0		23.0		18.0
Change Period, (Y+R _c), s		7.5	7.0	7.5		7.0		7.0
Max Allow Headway (MAH), s		0.0	2.8	0.0		3.1		3.3
Queue Clearance Time (g _s), s			2.3			6.2		2.6
Green Extension Time (g _e), s		0.0	0.0	0.0		0.1		0.0
Phase Call Probability			1.00			1.00		1.00
Max Out Probability			0.00			0.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	978	890	72	11	513	513		77	24		10	
Adjusted Saturation Flow Rate (s), veh/h/ln	1857	1695	1548	1757	1863	1862		1812	1610		1673	
Queue Service Time (g _s), s	11.1	46.0	3.1	0.3	17.5	17.5		4.2	1.4		0.6	
Cycle Queue Clearance Time (g _c), s	43.5	46.0	3.1	0.3	17.5	17.5		4.2	1.4		0.6	
Green Ratio (g/C)	0.42	0.42	0.42	0.54	0.58	0.58		0.16	0.16		0.12	
Capacity (c), veh/h	767	709	647	265	1084	1041		296	263		198	
Volume-to-Capacity Ratio (X)	1.275	1.256	0.111	0.043	0.473	0.493		0.260	0.091		0.053	
Available Capacity (c _a), veh/h	767	709	647	265	1084	1041		264	263		167	
Back of Queue (Q), veh/ln (50th percentile)	48.6	43.0	1.2	0.1	7.4	7.5		1.9	0.6		0.3	
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		0.00	
Uniform Delay (d ₁), s/veh	32.9	32.0	19.5	21.7	13.9	13.3		41.9	39.1		44.7	
Incremental Delay (d ₂), s/veh	134.0	126.5	0.3	0.0	1.5	1.7		0.2	0.1		0.0	
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Control Delay (d), s/veh	166.9	158.5	19.9	21.7	15.3	14.9		42.1	39.1		44.8	
Level of Service (LOS)	F	F	B	C	B	B		D	D		D	
Approach Delay, s/veh / LOS	157.6	F		15.2	B		41.4	D		44.8	D	
Intersection Delay, s/veh / LOS	105.6						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.1	B	2.9	C	2.9	C
Bicycle LOS Score / LOS	2.1	B	1.3	A	0.7	A	0.5	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{1_am} Rte 3 @ Central Pa	Analysis Year	2020 No Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	1_2020NB_AM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	280	2830	60	100	1280	30	10	30	170	10	10	90

Signal Information				Signal Phases											
Cycle, s	160.0	Reference Phase	2												
Offset, s	0	Reference Point	End	Green	27.5	59.5	12.5	14.0	10.0	0.0					
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.5	4.5	4.5	4.0	4.0	0.0					
Force Mode	Fixed	Simult. Gap N/S	On	Red	3.0	3.0	3.0	3.0	3.0	0.0					

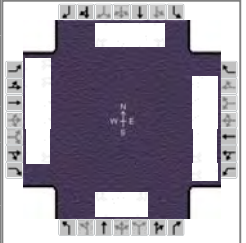
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	4.0		9.0		9.0
Phase Duration, s	35.0	102.0	20.0	87.0		21.0		17.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.0		3.0
Queue Clearance Time (g _s), s	14.5		6.6			18.0		10.6
Green Extension Time (g _e), s	0.5	0.0	2.0	0.0		0.0		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.00		0.40			1.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	292	2948	57	104	1027	337	10	31	160	10	10	85
Adjusted Saturation Flow Rate (s), veh/h/ln	1740	1691	1594	1658	1810	1780	1810	1845	1563	1757	1696	1548
Queue Service Time (g _s), s	12.5	0.0	0.0	4.6	6.4	7.8	0.8	2.5	16.0	0.9	0.5	8.6
Cycle Queue Clearance Time (g _c), s	12.5	0.0	0.0	4.6	6.4	7.8	0.8	2.5	16.0	0.9	0.5	8.6
Green Ratio (g/C)	0.18	0.61	0.61	0.09	0.51	0.51	0.10	0.10	0.10	0.08	0.08	0.08
Capacity (c), veh/h	631	3076	967	290	2782	884	181	184	156	132	254	116
Volume-to-Capacity Ratio (X)	0.463	0.958	0.059	0.359	0.369	0.381	0.058	0.169	1.026	0.079	0.041	0.736
Available Capacity (c _a), veh/h	631	3076	967	290	2782	884	181	184	156	132	254	116
Back of Queue (Q), veh/ln (50th percentile)	5.8	2.6	0.0	2.0	2.1	2.8	0.4	1.2	9.9	0.4	0.2	4.1
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	63.1	0.0	0.0	66.5	6.3	7.7	65.2	65.9	72.0	68.9	68.7	72.4
Incremental Delay (d ₂), s/veh	0.2	9.1	0.1	0.3	0.4	1.2	0.0	0.2	79.0	0.1	0.0	19.1
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	63.3	9.1	0.1	66.8	6.7	8.8	65.2	66.1	151.0	69.0	68.7	91.5
Level of Service (LOS)	E	A	A	E	A	A	E	E	F	E	E	F
Approach Delay, s/veh / LOS	13.7		B	11.5		B	133.5		F	87.1		F
Intersection Delay, s/veh / LOS	19.4						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.9	C	3.0	C	3.5	D	3.8	D
Bicycle LOS Score / LOS	2.3	B	1.1	A	0.8	A	0.6	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{1_pm} Rte 3 @ Central Pa	Analysis Year	2020 No Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	1_2020NB_PM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	350	1770	110	540	2580	70	90	110	440	110	200	400

Signal Information				Signal Phases											
Cycle, s	170.0	Reference Phase	2												
Offset, s	0	Reference Point	End	Green	25.5	42.5	33.5	14.0	18.0	0.0					
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.5	4.5	4.5	4.0	4.0	0.0					
Force Mode	Fixed	Simult. Gap N/S	On	Red	3.0	3.0	3.0	3.0	3.0	0.0					

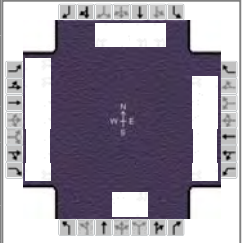
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	4.0		9.0		9.0
Phase Duration, s	33.0	83.0	41.0	91.0		21.0		25.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.0		3.0
Queue Clearance Time (g _s), s	18.6		27.1			18.0		22.0
Green Extension Time (g _e), s	0.4	0.0	4.6	0.0		0.0		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.02		0.78			1.00		1.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	365	1844	104	563	2078	682	94	115	418	115	208	379
Adjusted Saturation Flow Rate (s), veh/h/ln	1757	1675	1594	1757	1863	1828	1810	1900	1610	1792	1900	1610
Queue Service Time (g _s), s	16.6	60.2	9.6	25.1	26.1	30.4	8.4	9.9	16.0	10.2	8.7	20.0
Cycle Queue Clearance Time (g _c), s	16.6	60.2	9.6	25.1	26.1	30.4	8.4	9.9	16.0	10.2	8.7	20.0
Green Ratio (g/C)	0.16	0.46	0.46	0.21	0.51	0.51	0.09	0.09	0.09	0.12	0.12	0.12
Capacity (c), veh/h	558	2306	731	723	2827	898	170	179	152	211	447	189
Volume-to-Capacity Ratio (X)	0.653	0.800	0.142	0.777	0.735	0.760	0.550	0.641	2.756	0.544	0.466	2.002
Available Capacity (c _a), veh/h	558	2306	731	723	2827	898	170	179	152	211	447	189
Back of Queue (Q), veh/ln (50th percentile)	7.7	28.0	4.2	11.1	5.3	8.4	4.0	5.2	40.7	4.8	4.3	33.0
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	67.1	65.6	43.0	58.1	8.9	11.1	73.6	74.2	77.0	70.7	70.0	75.0
Incremental Delay (d ₂), s/veh	2.2	3.0	0.4	2.5	0.9	3.0	2.2	5.9	808.6	1.6	0.3	469.0
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	69.3	68.7	43.4	60.5	9.8	14.1	75.8	80.1	885.6	72.3	70.3	544.0
Level of Service (LOS)	E	E	D	E	A	B	E	F	F	E	E	F
Approach Delay, s/veh / LOS	67.6		E	19.3		B	616.9		F	326.4		F
Intersection Delay, s/veh / LOS	120.0						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.9	C	3.0	C	3.5	D	3.8	D
Bicycle LOS Score / LOS	1.8	A	1.9	A	1.5	A	1.1	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{2_} Rte 3 @ Carl D Silv	Analysis Year	2020 No Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	2_2020NB_AM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	160	3160	10	20	1200	500	10	10	20	390	10	60

Signal Information				Signal Timing (s)										
Cycle, s	160.0	Reference Phase	2	Green	24.5	50.5	9.5	10.0	29.0	0.0	1	2	3	4
Offset, s	0	Reference Point	End	Yellow	4.5	4.5	4.5	4.0	4.0	0.0	5	6	7	8
Uncoordinated	No	Simult. Gap E/W	On	Red	3.0	3.0	3.0	3.0	3.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On											

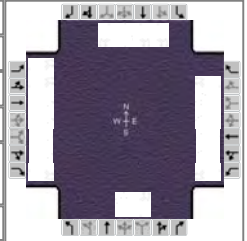
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	3.0		11.0		9.0
Phase Duration, s	32.0	90.0	17.0	75.0		17.0		36.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.1		2.8
Queue Clearance Time (g _s), s	9.0		3.8			3.9		18.6
Green Extension Time (g _e), s	0.2	0.0	2.4	0.0		0.0		0.7
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.00		0.52			0.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	167	3292	9	21	1250	521		21	19	406	10	56
Adjusted Saturation Flow Rate (s), veh/h/ln	1757	1708	1533	1774	1827	1579		1854	1464	1774	1900	1610
Queue Service Time (g _s), s	7.0	62.9	0.6	1.8	18.6	44.3		1.7	1.9	16.6	0.7	4.7
Cycle Queue Clearance Time (g _c), s	7.0	62.9	0.6	1.8	18.6	44.3		1.7	1.9	16.6	0.7	4.7
Green Ratio (g/C)	0.16	0.53	0.53	0.08	0.44	0.44		0.08	0.08	0.20	0.20	0.20
Capacity (c), veh/h	571	3630	815	133	3197	691		139	110	699	374	317
Volume-to-Capacity Ratio (X)	0.292	0.907	0.012	0.157	0.391	0.754		0.150	0.171	0.582	0.028	0.177
Available Capacity (c _a), veh/h	571	3630	815	133	3197	691		116	110	699	374	317
Back of Queue (Q), veh/ln (50th percentile)	3.2	22.0	0.2	0.8	8.4	18.6		0.8	0.7	7.6	0.3	1.9
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	62.9	21.0	24.4	69.3	31.3	37.8		70.6	69.3	58.3	51.9	53.5
Incremental Delay (d ₂), s/veh	0.1	4.4	0.0	0.2	0.4	7.5		0.2	0.3	0.8	0.0	0.1
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	63.0	25.4	24.4	69.5	31.6	45.3		70.8	69.6	59.1	51.9	53.6
Level of Service (LOS)	E	C	C	E	C	D		E	E	E	D	D
Approach Delay, s/veh / LOS	27.2	C		36.0	D		70.2	E		58.3	E	
Intersection Delay, s/veh / LOS	32.8						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	3.0	C	3.8	D	3.9	D
Bicycle LOS Score / LOS	1.9	A	1.2	A	0.6	A	1.3	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{2_pm} Rte 3 @ Carl D Silv	Analysis Year	2020 No Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	2_2020NB_PM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	300	2010	10	40	2990	1030	20	10	30	930	10	330

Signal Information				Signal Phases										
Cycle, s	170.0	Reference Phase	2											
Offset, s	0	Reference Point	End	Green	34.5	43.5	9.5	10.0	36.0	0.0	1	2	3	4
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.5	4.5	4.5	4.0	4.0	0.0	5	6	7	8
Force Mode	Fixed	Simult. Gap N/S	On	Red	3.0	3.0	3.0	3.0	3.0	0.0				

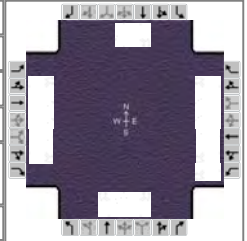
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	3.0		11.0		9.0
Phase Duration, s	42.0	93.0	17.0	68.0		17.0		43.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.1		2.9
Queue Clearance Time (g _s), s	15.8		5.9			4.9		40.5
Green Extension Time (g _e), s	0.5	0.0	3.3	0.0		0.0		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.00		0.98			0.04		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	313	2094	9	42	3115	1073		31	28	969	10	313
Adjusted Saturation Flow Rate (s), veh/h/ln	1757	1691	1610	1723	1881	1610		1768	1579	1810	1900	1610
Queue Service Time (g _s), s	13.8	14.9	0.1	3.9	63.0	63.0		2.9	2.9	38.5	0.7	31.7
Cycle Queue Clearance Time (g _c), s	13.8	14.9	0.1	3.9	63.0	63.0		2.9	2.9	38.5	0.7	31.7
Green Ratio (g/C)	0.21	0.52	0.52	0.07	0.37	0.37		0.07	0.07	0.23	0.23	0.23
Capacity (c), veh/h	744	3502	833	122	2789	597		125	111	820	430	365
Volume-to-Capacity Ratio (X)	0.420	0.598	0.011	0.343	1.117	1.798		0.250	0.252	1.182	0.024	0.857
Available Capacity (c _a), veh/h	744	3502	833	122	2789	597		104	111	820	430	365
Back of Queue (Q), veh/ln (50th percentile)	6.4	3.4	0.1	1.8	41.0	86.1		1.3	1.2	28.5	0.4	14.8
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	63.5	6.9	5.6	75.2	53.5	53.5		76.3	74.8	65.8	51.1	63.1
Incremental Delay (d ₂), s/veh	0.1	0.8	0.0	0.6	58.2	365.8		0.4	0.4	94.3	0.0	17.2
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	63.6	7.6	5.7	75.9	111.7	419.3		76.7	75.2	160.0	51.1	80.3
Level of Service (LOS)	E	A	A	E	F	F		E	E	F	D	F
Approach Delay, s/veh / LOS	14.9		B	189.4		F	76.0		E	139.9		F
Intersection Delay, s/veh / LOS	127.8						F					

Multimodal Results	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	2.3		B	3.0		C	3.8		D	3.9		D
Bicycle LOS Score / LOS	1.5		A	2.2		B	0.6		A	2.6		B

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{3_} Rte 3 @ Gateway E	Analysis Year	2020 No Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	3_2020NB_AM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	40	1430	350	110	1500	10	260	10	120	10	5	20

Signal Information				Signal Phases										
Cycle, s	114.0	Reference Phase	2											
Offset, s	0	Reference Point	End	Green	10.0	31.5	10.0	19.5	7.5	0.0	1	2	3	4
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.0	3.5	4.0	4.5	4.5	0.0	5	6	7	8
Force Mode	Fixed	Simult. Gap N/S	On	Red	3.0	3.0	3.0	3.0	3.0	0.0				

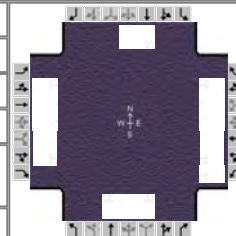
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	3.0		9.0		10.0
Phase Duration, s	17.0	55.0	17.0	55.0		27.0		15.0
Change Period, (Y+R _c), s	7.0	6.5	7.0	7.0		7.5		7.5
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		2.9		3.2
Queue Clearance Time (g _s), s	4.4		5.5			18.6		3.7
Green Extension Time (g _e), s	0.0	0.0	2.1	0.0		0.1		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.00		0.65			1.00		0.34

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	42	1490	330	115	1563	9	271	10	114	10	26	
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1675	1533	1706	1597	1610	1792	1900	1533	1691	1661	
Queue Service Time (g _s), s	2.4	26.1	17.0	3.5	10.3	0.1	16.6	0.5	7.4	0.7	1.7	
Cycle Queue Clearance Time (g _c), s	2.4	26.1	17.0	3.5	10.3	0.1	16.6	0.5	7.4	0.7	1.7	
Green Ratio (g/C)	0.10	0.46	0.46	0.10	0.45	0.45	0.18	0.18	0.18	0.08	0.08	
Capacity (c), veh/h	183	2292	699	344	2165	727	330	350	282	134	109	
Volume-to-Capacity Ratio (X)	0.228	0.650	0.472	0.333	0.722	0.013	0.821	0.030	0.402	0.078	0.238	
Available Capacity (c _a), veh/h	183	2292	699	344	2165	727	330	350	282	134	109	
Back of Queue (Q), veh/ln (50th percentile)	1.1	10.4	6.5	1.5	1.8	0.0	8.6	0.2	2.8	0.3	0.7	
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Uniform Delay (d ₁), s/veh	47.2	25.1	21.5	45.9	3.8	3.0	44.7	38.1	41.0	48.7	49.7	
Incremental Delay (d ₂), s/veh	0.2	1.4	2.3	0.2	2.1	0.0	14.2	0.0	0.3	0.1	0.4	
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	47.4	26.6	23.8	46.1	5.9	3.1	58.9	38.2	41.3	48.7	50.1	
Level of Service (LOS)	D	C	C	D	A	A	E	D	D	D	D	
Approach Delay, s/veh / LOS	26.5	C		8.6	A		53.3	D			49.7	D
Intersection Delay, s/veh / LOS	21.8						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.9	C	2.3	B	3.5	D	3.4	C
Bicycle LOS Score / LOS	1.5	A	1.4	A	1.1	A	0.5	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{3_} Rte 3 @ Gateway E	Analysis Year	2020 No Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	3_2020NB_PM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	30	1630	500	240	1500	0	330	5	230	10	5	5

Signal Information														
Cycle, s	114.0	Reference Phase	2											
Offset, s	0	Reference Point	End											
Uncoordinated	No	Simult. Gap E/W	On	Green	10.0	31.5	10.0	19.5	7.5	0.0				
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	3.5	4.0	4.5	4.5	0.0				
				Red	3.0	3.0	3.0	3.0	3.0	0.0				

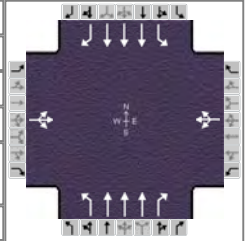
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	3.0		9.0		10.0
Phase Duration, s	17.0	55.0	17.0	55.0		27.0		15.0
Change Period, (Y+R _c), s	7.0	6.5	7.0	7.0		7.5		7.5
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		2.9		3.0
Queue Clearance Time (g _s), s	3.8		10.0			23.0		2.7
Green Extension Time (g _e), s	0.0	0.0	0.0	0.0		0.0		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.00		1.00			1.00		0.02

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	31	1698	486	250	1563	0	344	5	228	10	10	
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1675	1533	1706	1597	1610	1792	1900	1533	1691	1743	
Queue Service Time (g _s), s	1.8	31.6	28.8	8.0	10.3	0.0	21.0	0.3	16.3	0.7	0.6	
Cycle Queue Clearance Time (g _c), s	1.8	31.6	28.8	8.0	10.3	0.0	21.0	0.3	16.3	0.7	0.6	
Green Ratio (g/C)	0.10	0.46	0.46	0.10	0.45	0.45	0.18	0.18	0.18	0.08	0.08	
Capacity (c), veh/h	183	2292	699	344	2165	727	330	350	282	134	115	
Volume-to-Capacity Ratio (X)	0.171	0.741	0.695	0.726	0.722	0.000	1.042	0.015	0.808	0.078	0.091	
Available Capacity (c _a), veh/h	183	2292	699	344	2165	727	330	350	282	134	115	
Back of Queue (Q), veh/ln (50th percentile)	0.8	12.7	11.3	3.6	1.8	0.0	14.8	0.1	7.3	0.3	0.3	
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Uniform Delay (d ₁), s/veh	46.9	26.7	24.7	47.8	3.8	0.0	46.5	38.0	44.6	48.7	49.0	
Incremental Delay (d ₂), s/veh	0.2	2.2	5.6	6.5	2.1	0.0	60.8	0.0	14.8	0.1	0.1	
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	47.1	28.9	30.3	54.4	5.9	0.0	107.3	38.0	59.3	48.7	49.1	
Level of Service (LOS)	D	C	C	D	A		F	D	E	D	D	
Approach Delay, s/veh / LOS	29.5	C		12.6	B		87.7	F		48.9	D	
Intersection Delay, s/veh / LOS	30.2						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.9	C	2.3	B	3.5	D	3.4	C
Bicycle LOS Score / LOS	1.7	A	1.5	A	1.4	A	0.5	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{4_am} Rte 17 @ McLane I	Analysis Year	2020 No Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	4_2020NB_AM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	10	10	10	40	5	10	20	2570	40	30	2080	30

Signal Information													
Cycle, s	130.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On	Green	10.5	60.5	38.5	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.5	4.5	3.5	0.0	0.0	0.0			
				Red	3.0	3.0	3.0	0.0	0.0	0.0			

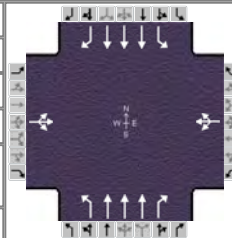
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		8.0		8.0	2.0	3.0	2.0	3.0
Phase Duration, s		45.0		45.0	17.0	68.0	17.0	68.0
Change Period, (Y+R _c), s		6.5		6.5	6.5	7.5	6.5	7.5
Max Allow Headway (MAH), s		3.2		3.2	2.8	0.0	2.8	0.0
Queue Clearance Time (g _s), s		3.7		5.4	3.4		4.1	
Green Extension Time (g _e), s		0.2		0.2	0.0	0.0	0.0	0.0
Phase Call Probability		1.00		1.00	1.00		1.00	
Max Out Probability		0.00		0.00	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	31			57			21	2677	39	31	2167	29
Adjusted Saturation Flow Rate (s), veh/h/ln	1575			1440			1740	1659	1548	1740	1659	1548
Queue Service Time (g _s), s	0.0			1.7			1.4	63.0	0.1	2.1	51.7	1.3
Cycle Queue Clearance Time (g _c), s	1.7			3.4			1.4	63.0	0.1	2.1	51.7	1.3
Green Ratio (g/C)	0.32			0.32			0.09	0.48	0.48	0.10	0.48	0.48
Capacity (c), veh/h	503			474			161	2412	750	174	2412	750
Volume-to-Capacity Ratio (X)	0.062			0.121			0.130	1.110	0.051	0.180	0.898	0.039
Available Capacity (c _a), veh/h	503			474			161	2412	750	174	2412	750
Back of Queue (Q), veh/ln (50th percentile)	0.7			1.3			0.6	21.4	0.1	1.0	21.4	0.5
Queue Storage Ratio (RQ) (50th percentile)	0.00			0.00			0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	32.5			33.2			54.2	12.5	1.0	53.6	31.7	17.6
Incremental Delay (d ₂), s/veh	0.0			0.0			0.1	56.2	0.1	0.2	5.9	0.1
Initial Queue Delay (d ₃), s/veh	0.0			0.0			0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	32.5			33.3			54.3	68.7	1.2	53.8	37.5	17.7
Level of Service (LOS)	C			C			D	F	A	D	D	B
Approach Delay, s/veh / LOS	32.5	C		33.3	C		67.6	E		37.5	D	
Intersection Delay, s/veh / LOS	53.7						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.4	C	3.4	C	2.1	B	2.1	B
Bicycle LOS Score / LOS	0.5	A	0.6	A	2.0	A	1.7	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{4_pm} Rte 17 @ McLane I	Analysis Year	2020 No Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	4_2020NB_PM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	10	5	10	40	5	20	10	2180	20	10	2730	20

Signal Information													
Cycle, s	160.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On	Green	10.5	90.5	38.5	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.5	4.5	3.5	0.0	0.0	0.0			
				Red	3.0	3.0	3.0	0.0	0.0	0.0			

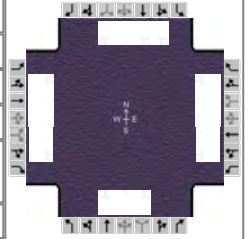
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		8.0		8.0	2.0	3.0	2.0	3.0
Phase Duration, s		45.0		45.0	17.0	98.0	17.0	98.0
Change Period, (Y+R _c), s		6.5		6.5	6.5	7.5	6.5	7.5
Max Allow Headway (MAH), s		3.2		3.2	2.8	0.0	2.8	0.0
Queue Clearance Time (g _s), s		3.9		7.5	2.9		2.9	
Green Extension Time (g _e), s		0.2		0.2	0.0	0.0	0.0	0.0
Phase Call Probability		1.00		1.00	1.00		1.00	
Max Out Probability		0.00		0.00	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	26			68			10	2271	18	10	2844	19
Adjusted Saturation Flow Rate (s), veh/h/ln	1537			1461			1740	1659	1548	1740	1659	1548
Queue Service Time (g _s), s	0.0			3.7			0.9	9.5	0.0	0.9	89.3	0.8
Cycle Queue Clearance Time (g _c), s	1.9			5.5			0.9	9.5	0.0	0.9	89.3	0.8
Green Ratio (g/C)	0.26			0.26			0.08	0.58	0.58	0.08	0.58	0.58
Capacity (c), veh/h	401			388			130	2893	900	141	2893	900
Volume-to-Capacity Ratio (X)	0.065			0.175			0.080	0.785	0.020	0.074	0.983	0.021
Available Capacity (c _a), veh/h	401			388			130	2893	900	141	2893	900
Back of Queue (Q), veh/ln (50th percentile)	0.8			2.2			0.4	1.5	0.0	0.4	38.3	0.3
Queue Storage Ratio (RQ) (50th percentile)	0.00			0.00			0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	46.7			48.1			68.9	1.2	0.0	67.9	33.5	14.2
Incremental Delay (d ₂), s/veh	0.0			0.1			0.1	2.2	0.0	0.1	13.2	0.0
Initial Queue Delay (d ₃), s/veh	0.0			0.0			0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	46.7			48.1			69.0	3.5	0.0	68.0	46.7	14.2
Level of Service (LOS)	D			D			E	A	A	E	D	B
Approach Delay, s/veh / LOS	46.7	D		48.1	D		3.7	A		46.6	D	
Intersection Delay, s/veh / LOS	27.9						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.4	C	3.4	C	2.1	B	2.1	B
Bicycle LOS Score / LOS	0.5	A	0.6	A	1.8	A	2.1	B

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{5_am} Rte 17 @ Sanford I	Analysis Year	2020 No Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	5_2020NB_AM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	10	2110	20	230	2570	240	60	10	170	160	70	20

Signal Information													
Cycle, s	130.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On	Green	23.5	39.5	9.5	11.0	10.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.5	4.5	4.5	4.0	4.0	0.0			
				Red	3.0	3.0	3.0	3.0	3.0	0.0			

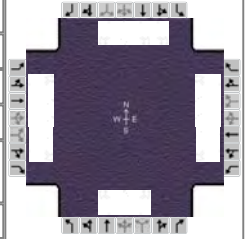
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	3.0		9.0		9.0
Phase Duration, s	17.0	64.0	31.0	78.0		18.0		17.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.0		2.9
Queue Clearance Time (g _s), s	2.7		18.7			14.7		8.1
Green Extension Time (g _e), s	3.7	0.0	0.2	0.0		0.0		0.1
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.55		0.12			1.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	10	2198	19	240	2677	234	63	10	152	167	73	19
Adjusted Saturation Flow Rate (s), veh/h/ln	1740	1659	1548	1740	1659	1548	1740	1827	1548	1689	1827	1548
Queue Service Time (g _s), s	0.7	56.5	0.9	16.7	69.3	10.3	4.4	0.7	12.7	6.1	4.9	1.5
Cycle Queue Clearance Time (g _c), s	0.7	56.5	0.9	16.7	69.3	10.3	4.4	0.7	12.7	6.1	4.9	1.5
Green Ratio (g/C)	0.07	0.43	0.43	0.20	0.54	0.54	0.10	0.10	0.10	0.10	0.10	0.10
Capacity (c), veh/h	127	2163	673	341	2699	863	147	183	155	312	176	119
Volume-to-Capacity Ratio (X)	0.082	1.016	0.028	0.702	0.992	0.271	0.425	0.057	0.982	0.534	0.415	0.157
Available Capacity (c _a), veh/h	127	2163	673	341	2699	863	147	183	155	312	176	119
Back of Queue (Q), veh/ln (50th percentile)	0.4	27.1	0.3	8.3	30.2	3.8	2.3	0.3	7.9	2.9	2.6	0.7
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	56.2	36.8	21.0	48.7	29.5	15.0	56.5	53.9	58.4	56.3	55.5	56.1
Incremental Delay (d ₂), s/veh	1.3	23.5	0.1	11.4	15.5	0.8	8.7	0.6	67.8	6.4	7.1	2.8
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	57.4	60.2	21.1	60.2	45.0	15.8	65.2	54.4	126.2	62.8	62.6	58.9
Level of Service (LOS)	E	F	C	E	D	B	E	D	F	E	E	E
Approach Delay, s/veh / LOS	59.9	E		44.0	D		105.9	F		62.4	E	
Intersection Delay, s/veh / LOS	53.2						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.5	B	2.6	B	3.4	C	3.4	C
Bicycle LOS Score / LOS	1.7	A	2.2	B	0.9	A	0.9	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{5_pm} Rte 17 @ Sanford I	Analysis Year	2020 No Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	5_2020NB_PM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	10	2620	50	260	2110	220	40	10	680	370	20	10

Signal Information				Signal Phases										
Cycle, s	160.0	Reference Phase	2	EB		WB		NB		SB				
Offset, s	0	Reference Point	End	Green	28.5	45.5	22.5	6.0	21.0	0.0	1	2	3	4
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.5	4.5	4.5	4.0	4.0	0.0	5	6	7	8
Force Mode	Fixed	Simult. Gap N/S	On	Red	3.0	3.0	3.0	3.0	3.0	0.0				

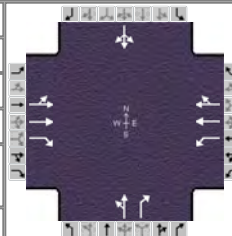
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	3.0		9.0		9.0
Phase Duration, s	30.0	83.0	36.0	89.0		13.0		28.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.0		2.8
Queue Clearance Time (g _s), s	2.8		25.9			10.0		19.6
Green Extension Time (g _e), s	9.1	0.0	0.1	0.0		0.0		0.2
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.22		1.00			1.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	10	2729	48	271	2198	221	42	10	622	385	21	9
Adjusted Saturation Flow Rate (s), veh/h/ln	1740	1659	1548	1740	1659	1548	1740	1827	1548	1689	1827	1548
Queue Service Time (g _s), s	0.8	75.5	2.7	23.9	62.1	12.7	3.8	0.9	8.0	17.6	1.6	0.8
Cycle Queue Clearance Time (g _c), s	0.8	75.5	2.7	23.9	62.1	12.7	3.8	0.9	8.0	17.6	1.6	0.8
Green Ratio (g/C)	0.14	0.47	0.47	0.19	0.51	0.51	0.05	0.05	0.05	0.15	0.15	0.15
Capacity (c), veh/h	245	2348	731	332	2535	808	65	91	77	486	268	203
Volume-to-Capacity Ratio (X)	0.043	1.162	0.066	0.817	0.867	0.273	0.639	0.114	8.033	0.793	0.078	0.046
Available Capacity (c _a), veh/h	245	2348	731	332	2535	808	65	91	77	486	268	203
Back of Queue (Q), veh/ln (50th percentile)	0.4	47.5	1.1	12.4	25.8	4.9	2.4	0.5	71.8	8.5	0.8	0.4
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	59.4	42.3	23.0	62.1	34.5	21.3	75.9	73.6	76.0	66.2	59.1	60.7
Incremental Delay (d ₂), s/veh	0.3	78.1	0.2	19.5	4.3	0.8	39.3	2.5	3191.3	12.5	0.6	0.4
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	59.8	120.4	23.2	81.6	38.8	22.2	115.2	76.1	3267.3	78.8	59.7	61.2
Level of Service (LOS)	E	F	C	F	D	C	F	E	F	E	E	E
Approach Delay, s/veh / LOS	118.5		F	41.8		D	3023.1		F	77.4		E
Intersection Delay, s/veh / LOS	382.6						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.6	B	2.6	B	3.4	C	3.4	C
Bicycle LOS Score / LOS	2.0	B	2.0	A	1.6	A	1.2	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{6_am} Rte 17 @ Short St	Analysis Year	2020 No Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	6_2020NB_AM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	10	1180	60	20	1250	5	100	0	10	5	0	10

Signal Information														
Cycle, s	100.0	Reference Phase	2											
Offset, s	0	Reference Point	End											
Uncoordinated	No	Simult. Gap E/W	On	Green	10.0	32.5	19.0	10.0	0.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.5	4.0	4.0	0.0	0.0				
				Red	3.0	3.0	3.0	3.0	0.0	0.0				

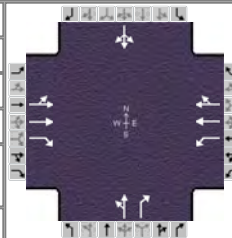
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6		8		4
Case Number		7.3	1.0	4.0		11.0		12.0
Phase Duration, s		40.0	17.0	57.0		26.0		17.0
Change Period, (Y+R _c), s		7.5	7.0	7.5		7.0		7.0
Max Allow Headway (MAH), s		0.0	2.8	0.0		3.1		3.3
Queue Clearance Time (g _s), s			2.6			6.9		2.8
Green Extension Time (g _e), s		0.0	0.0	0.0		0.1		0.0
Phase Call Probability			1.00			1.00		1.00
Max Out Probability			0.00			0.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	644	596	57	21	654	653		104	9		16	
Adjusted Saturation Flow Rate (s), veh/h/ln	1809	1679	1579	1810	1863	1860		1810	1563		1672	
Queue Service Time (g _s), s	11.9	35.0	2.4	0.6	26.0	26.0		4.9	0.5		0.8	
Cycle Queue Clearance Time (g _c), s	32.5	35.0	2.4	0.6	26.0	26.0		4.9	0.5		0.8	
Green Ratio (g/C)	0.35	0.35	0.35	0.48	0.52	0.52		0.21	0.21		0.12	
Capacity (c), veh/h	625	588	553	280	969	921		380	328		201	
Volume-to-Capacity Ratio (X)	1.031	1.014	0.104	0.074	0.675	0.709		0.274	0.029		0.078	
Available Capacity (c _a), veh/h	625	588	553	280	969	921		344	328		167	
Back of Queue (Q), veh/ln (50th percentile)	22.5	20.3	1.0	0.2	11.5	11.7		2.2	0.2		0.3	
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		0.00	
Uniform Delay (d ₁), s/veh	33.3	32.5	21.9	20.4	18.5	17.8		34.8	31.4		40.9	
Incremental Delay (d ₂), s/veh	44.2	40.6	0.4	0.0	3.8	4.6		0.1	0.0		0.1	
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Control Delay (d), s/veh	77.5	73.1	22.3	20.5	22.3	22.4		35.0	31.4		40.9	
Level of Service (LOS)	F	F	C	C	C	C		C	C		D	
Approach Delay, s/veh / LOS	73.1	E		22.3	C		34.7	C		40.9	D	
Intersection Delay, s/veh / LOS	46.8						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.1	B	2.9	C	2.9	C
Bicycle LOS Score / LOS	1.6	A	1.6	A	0.7	A	0.5	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{6_pm} Rte 17 @ Short St	Analysis Year	2020 No Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	6_2020NB_PM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	10	2020	90	10	1100	5	80	5	30	5	5	10

Signal Information														
Cycle, s	110.0	Reference Phase	2											
Offset, s	0	Reference Point	End											
Uncoordinated	No	Simult. Gap E/W	On	Green	11.0	43.5	16.0	11.0	0.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.5	4.0	4.0	0.0	0.0				
				Red	3.0	3.0	3.0	3.0	0.0	0.0				

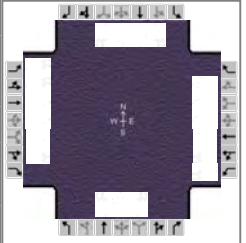
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6		8		4
Case Number		7.3	1.0	4.0		11.0		12.0
Phase Duration, s		51.0	18.0	69.0		23.0		18.0
Change Period, (Y+R _c), s		7.5	7.0	7.5		7.0		7.0
Max Allow Headway (MAH), s		0.0	2.8	0.0		3.1		3.3
Queue Clearance Time (g _s), s			2.3			6.8		3.2
Green Extension Time (g _e), s		0.0	0.0	0.0		0.1		0.0
Phase Call Probability			1.00			1.00		1.00
Max Out Probability			0.00			0.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	1107	1007	85	10	576	575		89	28		21	
Adjusted Saturation Flow Rate (s), veh/h/ln	1845	1695	1548	1757	1863	1860		1815	1610		1723	
Queue Service Time (g _s), s	16.0	46.0	3.7	0.3	20.6	20.6		4.8	1.6		1.2	
Cycle Queue Clearance Time (g _c), s	43.5	46.0	3.7	0.3	20.6	20.6		4.8	1.6		1.2	
Green Ratio (g/C)	0.42	0.42	0.42	0.54	0.58	0.58		0.16	0.16		0.12	
Capacity (c), veh/h	763	709	647	265	1084	1040		297	263		204	
Volume-to-Capacity Ratio (X)	1.452	1.421	0.132	0.039	0.531	0.553		0.298	0.107		0.102	
Available Capacity (c _a), veh/h	763	709	647	265	1084	1040		264	263		172	
Back of Queue (Q), veh/ln (50th percentile)	64.5	57.1	1.4	0.1	8.8	8.8		2.2	0.7		0.5	
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		0.00	
Uniform Delay (d ₁), s/veh	32.8	32.0	19.7	21.7	14.5	13.9		42.2	39.2		44.9	
Incremental Delay (d ₂), s/veh	210.7	197.6	0.4	0.0	1.9	2.1		0.2	0.1		0.1	
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Control Delay (d), s/veh	243.5	229.6	20.1	21.7	16.4	16.1		42.4	39.2		44.9	
Level of Service (LOS)	F	F	C	C	B	B		D	D		D	
Approach Delay, s/veh / LOS	228.5		F	16.3		B	41.6		D	44.9		D
Intersection Delay, s/veh / LOS	150.7						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.1	B	2.9	C	2.9	C
Bicycle LOS Score / LOS	2.3	B	1.4	A	0.7	A	0.5	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{1_am} Rte 3 @ Central Pa	Analysis Year	2020 Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	1_2020B_AM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	280	2930	60	100	1280	30	10	30	170	10	10	90

Signal Information				Signal Timing (s)									
Cycle, s	160.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On	Green	27.5	59.5	12.5	14.0	10.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.5	4.5	4.5	4.0	4.0	0.0			
				Red	3.0	3.0	3.0	3.0	3.0	0.0			

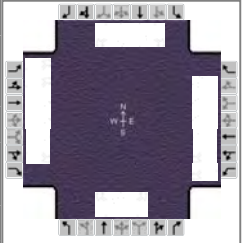
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	4.0		9.0		9.0
Phase Duration, s	35.0	102.0	20.0	87.0		21.0		17.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.0		3.0
Queue Clearance Time (g _s), s	14.5		6.6			18.0		10.6
Green Extension Time (g _e), s	0.5	0.0	2.0	0.0		0.0		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.00		0.40			1.00		1.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	292	3052	57	104	1027	337	10	31	160	10	10	85
Adjusted Saturation Flow Rate (s), veh/h/ln	1740	1691	1594	1658	1810	1780	1810	1845	1563	1757	1696	1548
Queue Service Time (g _s), s	12.5	0.0	0.0	4.6	6.4	7.8	0.8	2.5	16.0	0.9	0.5	8.6
Cycle Queue Clearance Time (g _c), s	12.5	0.0	0.0	4.6	6.4	7.8	0.8	2.5	16.0	0.9	0.5	8.6
Green Ratio (g/C)	0.18	0.61	0.61	0.09	0.51	0.51	0.10	0.10	0.10	0.08	0.08	0.08
Capacity (c), veh/h	631	3076	967	290	2782	884	181	184	156	132	254	116
Volume-to-Capacity Ratio (X)	0.463	0.992	0.059	0.359	0.369	0.381	0.058	0.169	1.026	0.079	0.041	0.736
Available Capacity (c _a), veh/h	631	3076	967	290	2782	884	181	184	156	132	254	116
Back of Queue (Q), veh/ln (50th percentile)	5.8	4.1	0.0	2.0	2.1	2.8	0.4	1.2	9.9	0.4	0.2	4.1
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	63.1	0.0	0.0	66.5	6.3	7.7	65.2	65.9	72.0	68.9	68.7	72.4
Incremental Delay (d ₂), s/veh	0.2	14.5	0.1	0.3	0.4	1.2	0.0	0.2	79.0	0.1	0.0	19.1
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	63.3	14.5	0.1	66.8	6.7	8.8	65.2	66.1	151.0	69.0	68.7	91.5
Level of Service (LOS)	E	B	A	E	A	A	E	E	F	E	E	F
Approach Delay, s/veh / LOS	18.4		B	11.5		B	133.5		F	87.1		F
Intersection Delay, s/veh / LOS	22.4						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.9	C	3.0	C	3.5	D	3.8	D
Bicycle LOS Score / LOS	2.4	B	1.1	A	0.8	A	0.6	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{1_pm} Rte 3 @ Central Pa	Analysis Year	2020 Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	1_2020B_PM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	350	1820	110	540	2580	70	90	110	440	110	200	400

Signal Information				Signal Phases											
Cycle, s	170.0	Reference Phase	2												
Offset, s	0	Reference Point	End	Green	25.5	42.5	33.5	14.0	18.0	0.0					
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.5	4.5	4.5	4.0	4.0	0.0					
Force Mode	Fixed	Simult. Gap N/S	On	Red	3.0	3.0	3.0	3.0	3.0	0.0					

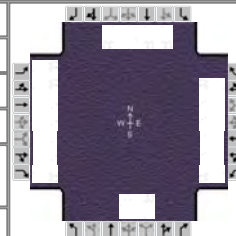
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	4.0		9.0		9.0
Phase Duration, s	33.0	83.0	41.0	91.0		21.0		25.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.0		3.0
Queue Clearance Time (g _s), s	18.6		27.1			18.0		22.0
Green Extension Time (g _e), s	0.4	0.0	4.6	0.0		0.0		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.02		0.78			1.00		1.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	365	1896	104	563	2078	682	94	115	418	115	208	379
Adjusted Saturation Flow Rate (s), veh/h/ln	1757	1675	1594	1757	1863	1828	1810	1900	1610	1792	1900	1610
Queue Service Time (g _s), s	16.6	62.1	9.6	25.1	26.1	30.4	8.4	9.9	16.0	10.2	8.7	20.0
Cycle Queue Clearance Time (g _c), s	16.6	62.1	9.6	25.1	26.1	30.4	8.4	9.9	16.0	10.2	8.7	20.0
Green Ratio (g/C)	0.16	0.46	0.46	0.21	0.51	0.51	0.09	0.09	0.09	0.12	0.12	0.12
Capacity (c), veh/h	558	2306	731	723	2827	898	170	179	152	211	447	189
Volume-to-Capacity Ratio (X)	0.653	0.822	0.142	0.777	0.735	0.760	0.550	0.641	2.756	0.544	0.466	2.002
Available Capacity (c _a), veh/h	558	2306	731	723	2827	898	170	179	152	211	447	189
Back of Queue (Q), veh/ln (50th percentile)	7.7	29.0	4.2	11.1	5.3	8.4	4.0	5.2	40.7	4.8	4.3	33.0
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	67.1	66.5	43.0	58.1	8.9	11.1	73.6	74.2	77.0	70.7	70.0	75.0
Incremental Delay (d ₂), s/veh	2.2	3.5	0.4	2.5	0.9	3.0	2.2	5.9	808.6	1.6	0.3	469.0
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	69.3	69.9	43.4	60.5	9.8	14.1	75.8	80.1	885.6	72.3	70.3	544.0
Level of Service (LOS)	E	E	D	E	A	B	E	F	F	E	E	F
Approach Delay, s/veh / LOS	68.7		E	19.3		B	616.9		F	326.4		F
Intersection Delay, s/veh / LOS	120.0						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.9	C	3.0	C	3.5	D	3.8	D
Bicycle LOS Score / LOS	1.8	A	1.9	A	1.5	A	1.1	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{2_} Rte 3 @ Carl D Silv	Analysis Year	2020 Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	2_2020B_AM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	160	3260	10	20	1230	450	10	10	20	490	10	30

Signal Information				Signal Timing (s)													
Cycle, s	160.0	Reference Phase	2	Green	24.5	50.5	9.5	10.0	29.0	0.0	Green	24.5	50.5	9.5	10.0	29.0	0.0
Offset, s	0	Reference Point	End	Yellow	4.5	4.5	4.5	4.0	4.0	0.0	Yellow	4.5	4.5	4.5	4.0	4.0	0.0
Uncoordinated	No	Simult. Gap E/W	On	Red	3.0	3.0	3.0	3.0	3.0	0.0	Red	3.0	3.0	3.0	3.0	3.0	0.0
Force Mode	Fixed	Simult. Gap N/S	On														

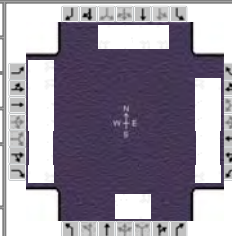
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	3.0		11.0		9.0
Phase Duration, s	32.0	90.0	17.0	75.0		17.0		36.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.1		2.8
Queue Clearance Time (g _s), s	9.0		3.8			3.9		23.6
Green Extension Time (g _e), s	0.2	0.0	2.4	0.0		0.0		0.6
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.00		0.51			0.00		0.14

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	167	3396	9	21	1281	469		21	19	510	10	25
Adjusted Saturation Flow Rate (s), veh/h/ln	1757	1708	1533	1774	1659	1579		1854	1464	1774	1900	1610
Queue Service Time (g _s), s	7.0	68.8	0.6	1.8	21.5	38.0		1.7	1.9	21.6	0.7	2.0
Cycle Queue Clearance Time (g _c), s	7.0	68.8	0.6	1.8	21.5	38.0		1.7	1.9	21.6	0.7	2.0
Green Ratio (g/C)	0.16	0.53	0.53	0.08	0.44	0.44		0.08	0.08	0.20	0.20	0.20
Capacity (c), veh/h	571	3630	815	133	2903	691		139	110	699	374	317
Volume-to-Capacity Ratio (X)	0.292	0.936	0.012	0.157	0.441	0.679		0.150	0.171	0.731	0.028	0.079
Available Capacity (c _a), veh/h	571	3630	815	133	2903	691		116	110	699	374	317
Back of Queue (Q), veh/ln (50th percentile)	3.2	24.4	0.2	0.8	8.9	15.8		0.8	0.7	10.1	0.3	0.8
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	62.9	22.0	24.4	69.3	32.1	36.0		70.6	69.3	60.3	51.9	52.4
Incremental Delay (d ₂), s/veh	0.1	6.0	0.0	0.2	0.5	5.3		0.2	0.3	3.4	0.0	0.0
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	63.0	27.9	24.4	69.5	32.6	41.3		70.8	69.6	63.7	51.9	52.5
Level of Service (LOS)	E	C	C	E	C	D		E	E	E	D	D
Approach Delay, s/veh / LOS	29.6	C		35.4	D		70.2	E		63.0	E	
Intersection Delay, s/veh / LOS	34.6						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	3.0	C	3.8	D	3.9	D
Bicycle LOS Score / LOS	2.0	A	1.2	A	0.6	A	1.4	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{2_pm} Rte 3 @ Carl D Silv	Analysis Year	2020 Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	2_2020B_PM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	300	2060	10	40	3100	830	20	10	30	970	10	220

Signal Information											
Cycle, s	170.0	Reference Phase	2								
Offset, s	0	Reference Point	End	Green	34.5	43.5	9.5	10.0	36.0	0.0	
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.5	4.5	4.5	4.0	4.0	0.0	
Force Mode	Fixed	Simult. Gap N/S	On	Red	3.0	3.0	3.0	3.0	3.0	0.0	

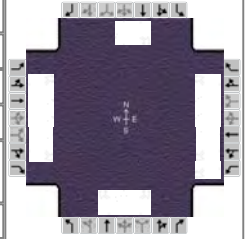
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	1.3	3.0		11.0		9.0
Phase Duration, s	42.0	93.0	17.0	68.0		17.0		43.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.1		2.8
Queue Clearance Time (g _s), s	15.8		2.0			4.9		40.5
Green Extension Time (g _e), s	0.5	0.0	6.4	0.0		0.0		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.00		0.88			0.04		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	313	2146	9	42	3229	865		31	28	1010	10	198
Adjusted Saturation Flow Rate (s), veh/h/ln	1757	1691	1610	1723	1708	1610		1768	1579	1810	1900	1610
Queue Service Time (g _s), s	13.8	15.7	0.1	0.0	63.0	63.0		2.9	2.9	38.5	0.7	18.4
Cycle Queue Clearance Time (g _c), s	13.8	15.7	0.1	0.0	63.0	63.0		2.9	2.9	38.5	0.7	18.4
Green Ratio (g/C)	0.21	0.52	0.52	0.31	0.37	0.37		0.07	0.07	0.23	0.23	0.23
Capacity (c), veh/h	744	3502	833	208	2532	597		125	111	820	430	365
Volume-to-Capacity Ratio (X)	0.420	0.613	0.011	0.200	1.275	1.449		0.250	0.252	1.233	0.024	0.543
Available Capacity (c _a), veh/h	744	3502	833	208	2532	597		104	111	820	430	365
Back of Queue (Q), veh/ln (50th percentile)	6.4	3.5	0.1	1.6	49.3	60.5		1.3	1.2	30.9	0.4	7.7
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	63.5	6.9	5.6	51.9	53.5	53.5		76.3	74.8	65.8	51.1	58.0
Incremental Delay (d ₂), s/veh	0.1	0.8	0.0	0.2	127.1	211.3		0.4	0.4	115.3	0.0	0.9
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	63.6	7.7	5.7	52.1	180.6	264.8		76.7	75.2	181.1	51.1	58.9
Level of Service (LOS)	E	A	A	D	F	F		E	E	F	D	E
Approach Delay, s/veh / LOS	14.8		B	196.9		F	76.0		E	160.1		F
Intersection Delay, s/veh / LOS	133.3						F					

Multimodal Results	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	2.3		B	3.0		C	3.8		D	3.9		D
Bicycle LOS Score / LOS	1.5		A	2.2		B	0.6		A	2.5		B

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{3_} Rte 3 @ Gateway E	Analysis Year	2020 Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	3_2020B_AM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	40	1580	350	110	1760	10	260	10	120	10	5	20

Signal Information														
Cycle, s	114.0	Reference Phase	2											
Offset, s	0	Reference Point	End											
Uncoordinated	No	Simult. Gap E/W	On	Green	10.0	31.5	10.0	19.5	7.5	0.0				
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	3.5	4.0	4.5	4.5	0.0				
				Red	3.0	3.0	3.0	3.0	3.0	0.0				

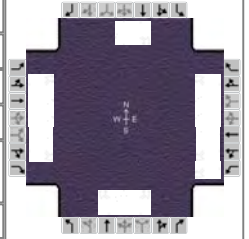
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	3.0		9.0		10.0
Phase Duration, s	17.0	55.0	17.0	55.0		27.0		15.0
Change Period, (Y+R _c), s	7.0	6.5	7.0	7.0		7.5		7.5
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		2.9		3.2
Queue Clearance Time (g _s), s	4.4		5.5			18.6		3.7
Green Extension Time (g _e), s	0.0	0.0	2.4	0.0		0.1		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.00		0.71			1.00		0.34

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	42	1646	330	115	1833	9	271	10	114	10	26	
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1675	1533	1706	1597	1610	1792	1900	1533	1691	1661	
Queue Service Time (g _s), s	2.4	30.2	17.0	3.5	17.9	0.1	16.6	0.5	7.4	0.7	1.7	
Cycle Queue Clearance Time (g _c), s	2.4	30.2	17.0	3.5	17.9	0.1	16.6	0.5	7.4	0.7	1.7	
Green Ratio (g/C)	0.10	0.46	0.46	0.10	0.45	0.45	0.18	0.18	0.18	0.08	0.08	
Capacity (c), veh/h	183	2292	699	344	2165	727	330	350	282	134	109	
Volume-to-Capacity Ratio (X)	0.228	0.718	0.472	0.333	0.847	0.013	0.821	0.030	0.402	0.078	0.238	
Available Capacity (c _a), veh/h	183	2292	699	344	2165	727	330	350	282	134	109	
Back of Queue (Q), veh/ln (50th percentile)	1.1	12.1	6.5	1.5	2.5	0.0	8.6	0.2	2.8	0.3	0.7	
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Uniform Delay (d ₁), s/veh	47.2	26.3	21.5	45.9	4.3	3.0	44.7	38.1	41.0	48.7	49.7	
Incremental Delay (d ₂), s/veh	0.2	2.0	2.3	0.2	4.3	0.0	14.2	0.0	0.3	0.1	0.4	
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	47.4	28.3	23.8	46.1	8.6	3.1	58.9	38.2	41.3	48.7	50.1	
Level of Service (LOS)	D	C	C	D	A	A	E	D	D	D	D	
Approach Delay, s/veh / LOS	27.9	C		10.8	B		53.3	D		49.7	D	
Intersection Delay, s/veh / LOS	22.8						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.9	C	2.3	B	3.5	D	3.4	C
Bicycle LOS Score / LOS	1.6	A	1.6	A	1.1	A	0.5	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{3_pm} Rte 3 @ Gateway E	Analysis Year	2020 Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	3_2020B_PM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	30	1830	500	240	1650	0	330	5	230	10	5	5

Signal Information				Signal Timing (s)									
Cycle, s	114.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On	Green	10.0	31.5	10.0	19.5	7.5	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	3.5	4.0	4.5	4.5	0.0			
				Red	3.0	3.0	3.0	3.0	3.0	0.0			

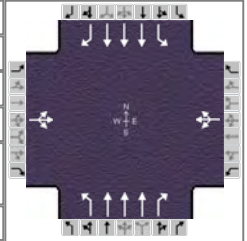
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	3.0		9.0		10.0
Phase Duration, s	17.0	55.0	17.0	55.0		27.0		15.0
Change Period, (Y+R _c), s	7.0	6.5	7.0	7.0		7.5		7.5
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		2.9		3.0
Queue Clearance Time (g _s), s	3.8		10.0			23.0		2.7
Green Extension Time (g _e), s	0.0	0.0	0.0	0.0		0.0		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.00		1.00			1.00		0.02

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	31	1906	486	250	1719	0	344	5	228	10	10	
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1675	1533	1706	1597	1610	1792	1900	1533	1691	1743	
Queue Service Time (g _s), s	1.8	37.9	28.8	8.0	14.0	0.0	21.0	0.3	16.3	0.7	0.6	
Cycle Queue Clearance Time (g _c), s	1.8	37.9	28.8	8.0	14.0	0.0	21.0	0.3	16.3	0.7	0.6	
Green Ratio (g/C)	0.10	0.46	0.46	0.10	0.45	0.45	0.18	0.18	0.18	0.08	0.08	
Capacity (c), veh/h	183	2292	699	344	2165	727	330	350	282	134	115	
Volume-to-Capacity Ratio (X)	0.171	0.832	0.695	0.726	0.794	0.000	1.042	0.015	0.808	0.078	0.091	
Available Capacity (c _a), veh/h	183	2292	699	344	2165	727	330	350	282	134	115	
Back of Queue (Q), veh/ln (50th percentile)	0.8	15.5	11.3	3.6	2.2	0.0	14.8	0.1	7.3	0.3	0.3	
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Uniform Delay (d ₁), s/veh	46.9	28.6	24.7	47.8	4.0	0.0	46.5	38.0	44.6	48.7	49.0	
Incremental Delay (d ₂), s/veh	0.2	3.7	5.6	6.5	3.1	0.0	60.8	0.0	14.8	0.1	0.1	
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	47.1	32.3	30.3	54.4	7.1	0.0	107.3	38.0	59.3	48.7	49.1	
Level of Service (LOS)	D	C	C	D	A		F	D	E	D	D	
Approach Delay, s/veh / LOS	32.1		C	13.1		B	87.7		F	48.9		D
Intersection Delay, s/veh / LOS	31.1						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.9	C	2.3	B	3.5	D	3.4	C
Bicycle LOS Score / LOS	1.8	A	1.6	A	1.4	A	0.5	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{4_am} Rte 17 @ McLane I	Analysis Year	2020 Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	4_2020B_AM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	20	10	10	40	5	10	20	2570	40	30	2090	30

Signal Information													
Cycle, s	130.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On	Green	10.5	60.5	38.5	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.5	4.5	3.5	0.0	0.0	0.0			
				Red	3.0	3.0	3.0	0.0	0.0	0.0			

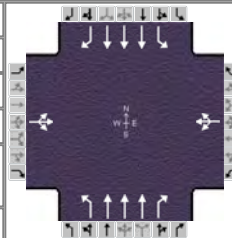
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		8.0		8.0	2.0	3.0	2.0	3.0
Phase Duration, s		45.0		45.0	17.0	68.0	17.0	68.0
Change Period, (Y+R _c), s		6.5		6.5	6.5	7.5	6.5	7.5
Max Allow Headway (MAH), s		3.2		3.2	2.8	0.0	2.8	0.0
Queue Clearance Time (g _s), s		4.2		5.2	3.4		4.1	
Green Extension Time (g _e), s		0.2		0.2	0.0	0.0	0.0	0.0
Phase Call Probability		1.00		1.00	1.00		1.00	
Max Out Probability		0.00		0.00	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	42			57			21	2677	39	31	2177	29
Adjusted Saturation Flow Rate (s), veh/h/ln	1528			1446			1740	1659	1548	1740	1659	1548
Queue Service Time (g _s), s	0.0			1.0			1.4	63.0	0.1	2.1	52.1	1.3
Cycle Queue Clearance Time (g _c), s	2.2			3.2			1.4	63.0	0.1	2.1	52.1	1.3
Green Ratio (g/C)	0.32			0.32			0.09	0.48	0.48	0.10	0.48	0.48
Capacity (c), veh/h	494			476			161	2412	750	174	2412	750
Volume-to-Capacity Ratio (X)	0.084			0.120			0.130	1.110	0.051	0.180	0.903	0.039
Available Capacity (c _a), veh/h	494			476			161	2412	750	174	2412	750
Back of Queue (Q), veh/ln (50th percentile)	1.0			1.3			0.6	21.4	0.1	1.0	21.6	0.5
Queue Storage Ratio (RQ) (50th percentile)	0.00			0.00			0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	32.8			33.2			54.2	12.5	1.0	53.6	31.8	17.6
Incremental Delay (d ₂), s/veh	0.0			0.0			0.1	56.2	0.1	0.2	6.1	0.1
Initial Queue Delay (d ₃), s/veh	0.0			0.0			0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	32.8			33.2			54.3	68.7	1.2	53.8	37.9	17.7
Level of Service (LOS)	C			C			D	F	A	D	D	B
Approach Delay, s/veh / LOS	32.8	C		33.2	C		67.6	E		37.8	D	
Intersection Delay, s/veh / LOS	53.8						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.4	C	3.4	C	2.1	B	2.1	B
Bicycle LOS Score / LOS	0.6	A	0.6	A	2.0	A	1.7	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{4_pm} Rte 17 @ McLane I	Analysis Year	2020 Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	4_2020B_PM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	10	5	10	40	5	20	10	2180	20	10	2730	20

Signal Information													
Cycle, s	160.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On	Green	10.5	90.5	38.5	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.5	4.5	3.5	0.0	0.0	0.0			
				Red	3.0	3.0	3.0	0.0	0.0	0.0			

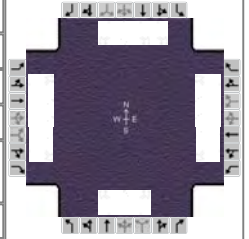
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		8.0		8.0	2.0	3.0	2.0	3.0
Phase Duration, s		45.0		45.0	17.0	98.0	17.0	98.0
Change Period, (Y+R _c), s		6.5		6.5	6.5	7.5	6.5	7.5
Max Allow Headway (MAH), s		3.2		3.2	2.8	0.0	2.8	0.0
Queue Clearance Time (g _s), s		3.9		7.5	2.9		2.9	
Green Extension Time (g _e), s		0.2		0.2	0.0	0.0	0.0	0.0
Phase Call Probability		1.00		1.00	1.00		1.00	
Max Out Probability		0.00		0.00	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	26			68			10	2271	18	10	2844	19
Adjusted Saturation Flow Rate (s), veh/h/ln	1537			1461			1740	1659	1548	1740	1659	1548
Queue Service Time (g _s), s	0.0			3.7			0.9	9.5	0.0	0.9	89.3	0.8
Cycle Queue Clearance Time (g _c), s	1.9			5.5			0.9	9.5	0.0	0.9	89.3	0.8
Green Ratio (g/C)	0.26			0.26			0.08	0.58	0.58	0.08	0.58	0.58
Capacity (c), veh/h	401			388			130	2893	900	141	2893	900
Volume-to-Capacity Ratio (X)	0.065			0.175			0.080	0.785	0.020	0.074	0.983	0.021
Available Capacity (c _a), veh/h	401			388			130	2893	900	141	2893	900
Back of Queue (Q), veh/ln (50th percentile)	0.8			2.2			0.4	1.5	0.0	0.4	38.3	0.3
Queue Storage Ratio (RQ) (50th percentile)	0.00			0.00			0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	46.7			48.1			68.9	1.2	0.0	67.9	33.5	14.2
Incremental Delay (d ₂), s/veh	0.0			0.1			0.1	2.2	0.0	0.1	13.2	0.0
Initial Queue Delay (d ₃), s/veh	0.0			0.0			0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	46.7			48.1			69.0	3.5	0.0	68.0	46.7	14.2
Level of Service (LOS)	D			D			E	A	A	E	D	B
Approach Delay, s/veh / LOS	46.7	D		48.1	D		3.7	A		46.6	D	
Intersection Delay, s/veh / LOS	27.9						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.4	C	3.4	C	2.1	B	2.1	B
Bicycle LOS Score / LOS	0.5	A	0.6	A	1.8	A	2.1	B

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{5_am} Rte 17 @ Sanford I	Analysis Year	2020 Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	5_2020B_AM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	10	2110	20	230	2570	240	60	10	170	160	70	20

Signal Information													
Cycle, s	130.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On	Green	23.5	39.5	9.5	11.0	10.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.5	4.5	4.5	4.0	4.0	0.0			
				Red	3.0	3.0	3.0	3.0	3.0	0.0			

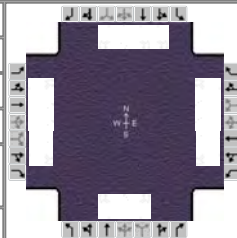
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	3.0		9.0		9.0
Phase Duration, s	17.0	64.0	31.0	78.0		18.0		17.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.0		2.9
Queue Clearance Time (g _s), s	2.7		18.7			14.7		8.1
Green Extension Time (g _e), s	3.7	0.0	0.2	0.0		0.0		0.1
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.55		0.12			1.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	10	2198	19	240	2677	234	63	10	152	167	73	19
Adjusted Saturation Flow Rate (s), veh/h/ln	1740	1659	1548	1740	1659	1548	1740	1827	1548	1689	1827	1548
Queue Service Time (g _s), s	0.7	56.5	0.9	16.7	69.3	10.3	4.4	0.7	12.7	6.1	4.9	1.5
Cycle Queue Clearance Time (g _c), s	0.7	56.5	0.9	16.7	69.3	10.3	4.4	0.7	12.7	6.1	4.9	1.5
Green Ratio (g/C)	0.07	0.43	0.43	0.20	0.54	0.54	0.10	0.10	0.10	0.10	0.10	0.10
Capacity (c), veh/h	127	2163	673	341	2699	863	147	183	155	312	176	119
Volume-to-Capacity Ratio (X)	0.082	1.016	0.028	0.702	0.992	0.271	0.425	0.057	0.982	0.534	0.415	0.157
Available Capacity (c _a), veh/h	127	2163	673	341	2699	863	147	183	155	312	176	119
Back of Queue (Q), veh/ln (50th percentile)	0.4	27.1	0.3	8.3	30.2	3.8	2.3	0.3	7.9	2.9	2.6	0.7
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	56.2	36.8	21.0	48.7	29.5	15.0	56.5	53.9	58.4	56.3	55.5	56.1
Incremental Delay (d ₂), s/veh	1.3	23.5	0.1	11.4	15.5	0.8	8.7	0.6	67.8	6.4	7.1	2.8
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	57.4	60.2	21.1	60.2	45.0	15.8	65.2	54.4	126.2	62.8	62.6	58.9
Level of Service (LOS)	E	F	C	E	D	B	E	D	F	E	E	E
Approach Delay, s/veh / LOS	59.9	E		44.0	D		105.9	F		62.4	E	
Intersection Delay, s/veh / LOS	53.2						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.5	B	2.6	B	3.4	C	3.4	C
Bicycle LOS Score / LOS	1.7	A	2.2	B	0.9	A	0.9	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{5_pm} Rte 17 @ Sanford I	Analysis Year	2020 Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	5_2020B_PM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	10	2620	50	260	2110	220	40	10	680	370	20	10

Signal Information													
Cycle, s	160.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On	Green	28.5	45.5	22.5	6.0	21.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.5	4.5	4.5	4.0	4.0	0.0			
				Red	3.0	3.0	3.0	3.0	3.0	0.0			

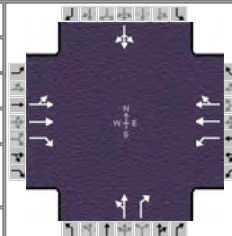
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	3.0		9.0		9.0
Phase Duration, s	30.0	83.0	36.0	89.0		13.0		28.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.0		2.8
Queue Clearance Time (g _s), s	2.8		25.9			10.0		19.6
Green Extension Time (g _e), s	9.1	0.0	0.1	0.0		0.0		0.2
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.22		1.00			1.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	10	2729	48	271	2198	221	42	10	622	385	21	9
Adjusted Saturation Flow Rate (s), veh/h/ln	1740	1659	1548	1740	1659	1548	1740	1827	1548	1689	1827	1548
Queue Service Time (g _s), s	0.8	75.5	2.7	23.9	62.1	12.7	3.8	0.9	8.0	17.6	1.6	0.8
Cycle Queue Clearance Time (g _c), s	0.8	75.5	2.7	23.9	62.1	12.7	3.8	0.9	8.0	17.6	1.6	0.8
Green Ratio (g/C)	0.14	0.47	0.47	0.19	0.51	0.51	0.05	0.05	0.05	0.15	0.15	0.15
Capacity (c), veh/h	245	2348	731	332	2535	808	65	91	77	486	268	203
Volume-to-Capacity Ratio (X)	0.043	1.162	0.066	0.817	0.867	0.273	0.639	0.114	8.033	0.793	0.078	0.046
Available Capacity (c _a), veh/h	245	2348	731	332	2535	808	65	91	77	486	268	203
Back of Queue (Q), veh/ln (50th percentile)	0.4	47.5	1.1	12.4	25.8	4.9	2.4	0.5	71.8	8.5	0.8	0.4
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	59.4	42.3	23.0	62.1	34.5	21.3	75.9	73.6	76.0	66.2	59.1	60.7
Incremental Delay (d ₂), s/veh	0.3	78.1	0.2	19.5	4.3	0.8	39.3	2.5	3191.3	12.5	0.6	0.4
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	59.8	120.4	23.2	81.6	38.8	22.2	115.2	76.1	3267.3	78.8	59.7	61.2
Level of Service (LOS)	E	F	C	F	D	C	F	E	F	E	E	E
Approach Delay, s/veh / LOS	118.5		F	41.8		D	3023.1		F	77.4		E
Intersection Delay, s/veh / LOS	382.6						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.6	B	2.6	B	3.4	C	3.4	C
Bicycle LOS Score / LOS	2.0	B	2.0	A	1.6	A	1.2	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{6_am} Rte 17 @ Short St	Analysis Year	2020 Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	6_2020B_AM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	10	1160	60	20	1020	5	100	0	10	5	0	10

Signal Information														
Cycle, s	100.0	Reference Phase	2											
Offset, s	0	Reference Point	End											
Uncoordinated	No	Simult. Gap E/W	On	Green	10.0	32.5	19.0	10.0	0.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.5	4.0	4.0	0.0	0.0				
				Red	3.0	3.0	3.0	3.0	0.0	0.0				

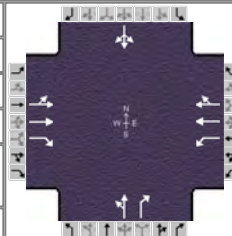
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6		8		4
Case Number		7.3	1.0	4.0		11.0		12.0
Phase Duration, s		40.0	17.0	57.0		26.0		17.0
Change Period, (Y+R _c), s		7.5	7.0	7.5		7.0		7.0
Max Allow Headway (MAH), s		0.0	2.8	0.0		3.1		3.3
Queue Clearance Time (g _s), s			2.6			6.9		2.8
Green Extension Time (g _e), s		0.0	0.0	0.0		0.1		0.0
Phase Call Probability			1.00			1.00		1.00
Max Out Probability			0.00			0.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	634	584	57	21	534	533		104	9		16	
Adjusted Saturation Flow Rate (s), veh/h/ln	1818	1679	1579	1810	1863	1859		1810	1563		1672	
Queue Service Time (g _s), s	11.9	34.7	2.4	0.6	19.3	19.3		4.9	0.5		0.8	
Cycle Queue Clearance Time (g _c), s	32.5	34.7	2.4	0.6	19.3	19.3		4.9	0.5		0.8	
Green Ratio (g/C)	0.35	0.35	0.35	0.48	0.52	0.52		0.21	0.21		0.12	
Capacity (c), veh/h	627	588	553	280	969	920		380	328		201	
Volume-to-Capacity Ratio (X)	1.011	0.995	0.104	0.074	0.552	0.579		0.274	0.029		0.078	
Available Capacity (c _a), veh/h	627	588	553	280	969	920		344	328		167	
Back of Queue (Q), veh/ln (50th percentile)	21.6	19.4	1.0	0.2	8.4	8.5		2.2	0.2		0.3	
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		0.00	
Uniform Delay (d ₁), s/veh	33.3	32.4	21.9	20.4	16.8	16.2		34.8	31.4		40.9	
Incremental Delay (d ₂), s/veh	38.7	35.9	0.4	0.0	2.3	2.7		0.1	0.0		0.1	
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Control Delay (d), s/veh	72.1	68.3	22.3	20.5	19.1	18.8		35.0	31.4		40.9	
Level of Service (LOS)	F	E	C	C	B	B		C	C		D	
Approach Delay, s/veh / LOS	68.1		E	19.0		B	34.7		C	40.9		D
Intersection Delay, s/veh / LOS	45.0						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.1	B	2.9	C	2.9	C
Bicycle LOS Score / LOS	1.5	A	1.4	A	0.7	A	0.5	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{6_pm} Rte 17 @ Short St	Analysis Year	2020 Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	6_2020B_PM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	10	1810	90	10	940	5	80	5	30	5	5	10

Signal Information														
Cycle, s	110.0	Reference Phase	2											
Offset, s	0	Reference Point	End											
Uncoordinated	No	Simult. Gap E/W	On	Green	11.0	43.5	16.0	11.0	0.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.5	4.0	4.0	0.0	0.0				
				Red	3.0	3.0	3.0	3.0	0.0	0.0				

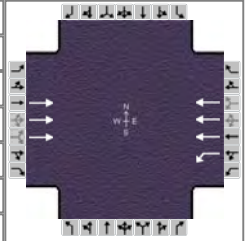
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6		8		4
Case Number		7.3	1.0	4.0		11.0		12.0
Phase Duration, s		51.0	18.0	69.0		23.0		18.0
Change Period, (Y+R _c), s		7.5	7.0	7.5		7.0		7.0
Max Allow Headway (MAH), s		0.0	2.8	0.0		3.1		3.3
Queue Clearance Time (g _s), s			2.3			6.8		3.2
Green Extension Time (g _e), s		0.0	0.0	0.0		0.1		0.0
Phase Call Probability			1.00			1.00		1.00
Max Out Probability			0.00			0.00		0.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	993	903	85	10	493	492		89	28		21	
Adjusted Saturation Flow Rate (s), veh/h/ln	1847	1695	1548	1757	1863	1859		1815	1610		1723	
Queue Service Time (g _s), s	16.0	46.0	3.7	0.3	16.5	16.5		4.8	1.6		1.2	
Cycle Queue Clearance Time (g _c), s	43.5	46.0	3.7	0.3	16.5	16.5		4.8	1.6		1.2	
Green Ratio (g/C)	0.42	0.42	0.42	0.54	0.58	0.58		0.16	0.16		0.12	
Capacity (c), veh/h	763	709	647	265	1084	1039		297	263		204	
Volume-to-Capacity Ratio (X)	1.301	1.274	0.132	0.039	0.455	0.473		0.298	0.107		0.102	
Available Capacity (c _a), veh/h	763	709	647	265	1084	1039		264	263		172	
Back of Queue (Q), veh/ln (50th percentile)	50.6	44.5	1.4	0.1	7.0	7.1		2.2	0.7		0.5	
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		0.00	
Uniform Delay (d ₁), s/veh	32.8	32.0	19.7	21.7	13.7	13.1		42.2	39.2		44.9	
Incremental Delay (d ₂), s/veh	144.8	134.1	0.4	0.0	1.4	1.5		0.2	0.1		0.1	
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Control Delay (d), s/veh	177.6	166.1	20.1	21.7	15.0	14.6		42.4	39.2		44.9	
Level of Service (LOS)	F	F	C	C	B	B		D	D		D	
Approach Delay, s/veh / LOS	165.6		F	14.9		B	41.6		D	44.9		D
Intersection Delay, s/veh / LOS	112.0						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.1	B	2.9	C	2.9	C
Bicycle LOS Score / LOS	2.1	B	1.3	A	0.7	A	0.5	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Michael Baker Jr.			Duration, h	0.25
Analyst	ZPH	Analysis Date	Apr 29, 2014	Area Type	Other
Jurisdiction		Time Period	AM Peak	PHF	0.92
Intersection	7-AM-Ramp F	Analysis Year	2020 Build	Analysis Period	1 > 7:00
File Name	7_2020B_AM_NotOpt.xus				
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h		1370		120	2550							

Signal Information												
Cycle, s	130.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
		Green	11.3	103.7	0.0	0.0	0.0	0.0				
		Yellow	4.5	4.5	0.0	0.0	0.0	0.0				
		Red	3.0	3.0	0.0	0.0	0.0	0.0				

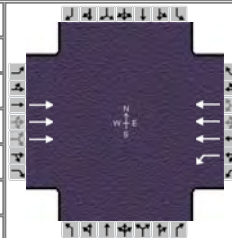
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6				
Case Number		8.3	2.0	4.0				
Phase Duration, s		111.2	18.8	130.0				
Change Period, (Y+R _c), s		7.5	7.5	7.5				
Max Allow Headway (MAH), s		0.0	3.1	0.0				
Queue Clearance Time (g _s), s			11.2					
Green Extension Time (g _e), s		0.0	0.2	0.0				
Phase Call Probability			0.99					
Max Out Probability			0.00					

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2		1	6							
Adjusted Flow Rate (v), veh/h		1489		130	2772							
Adjusted Saturation Flow Rate (s), veh/h/ln		1725		1810	1725							
Queue Service Time (g _s), s		10.6		9.2	8.6							
Cycle Queue Clearance Time (g _c), s		10.6		9.2	8.6							
Green Ratio (g/C)		0.80		0.09	0.94							
Capacity (c), veh/h		4129		157	4877							
Volume-to-Capacity Ratio (X)		0.361		0.831	0.568							
Available Capacity (c _a), veh/h		4129		327	4877							
Back of Queue (Q), veh/ln (50th percentile)		3.0		4.4	0.2							
Queue Storage Ratio (RQ) (50th percentile)		0.00		0.00	0.00							
Uniform Delay (d ₁), s/veh		3.7		58.4	0.5							
Incremental Delay (d ₂), s/veh		0.2		4.3	0.5							
Initial Queue Delay (d ₃), s/veh		0.0		0.0	0.0							
Control Delay (d), s/veh		4.0		62.7	1.0							
Level of Service (LOS)		A		E	A							
Approach Delay, s/veh / LOS	4.0	A		3.7	A		0.0			0.0		
Intersection Delay, s/veh / LOS			3.8						A			

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.8	A	0.5	A	3.3	C	3.2	C
Bicycle LOS Score / LOS	1.3	A	2.1	B				

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Michael Baker Jr.			Duration, h	0.25
Analyst	ZPH	Analysis Date	Apr 29, 2014	Area Type	Other
Jurisdiction		Time Period	PM Peak	PHF	0.92
Intersection	7-PM-Ramp F	Analysis Year	2020 Build	Analysis Period	1 > 7:00
File Name	7_2020B_PM_NotOpt.xus				
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h		1630		150	2040							

Signal Information												
Cycle, s	160.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
		Green	16.5	128.5	0.0	0.0	0.0	0.0				
		Yellow	4.5	4.5	0.0	0.0	0.0	0.0				
		Red	3.0	3.0	0.0	0.0	0.0	0.0				

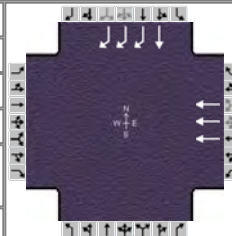
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6				
Case Number		8.3	2.0	4.0				
Phase Duration, s		136.0	24.0	160.0				
Change Period, (Y+R _c), s		7.5	7.5	7.5				
Max Allow Headway (MAH), s		0.0	3.1	0.0				
Queue Clearance Time (g _s), s			16.2					
Green Extension Time (g _e), s		0.0	0.3	0.0				
Phase Call Probability			1.00					
Max Out Probability			0.00					

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2		1	6							
Adjusted Flow Rate (v), veh/h		1772		163	2217							
Adjusted Saturation Flow Rate (s), veh/h/ln		1725		1810	1725							
Queue Service Time (g _s), s		16.4		14.2	5.6							
Cycle Queue Clearance Time (g _c), s		16.4		14.2	5.6							
Green Ratio (g/C)		0.80		0.10	0.95							
Capacity (c), veh/h		4157		186	4933							
Volume-to-Capacity Ratio (X)		0.426		0.875	0.450							
Available Capacity (c _a), veh/h		4157		492	4933							
Back of Queue (Q), veh/ln (50th percentile)		5.2		6.8	0.1							
Queue Storage Ratio (RQ) (50th percentile)		0.00		0.00	0.00							
Uniform Delay (d ₁), s/veh		4.7		70.7	0.3							
Incremental Delay (d ₂), s/veh		0.3		5.0	0.3							
Initial Queue Delay (d ₃), s/veh		0.0		0.0	0.0							
Control Delay (d), s/veh		5.0		75.7	0.6							
Level of Service (LOS)		A		E	A							
Approach Delay, s/veh / LOS	5.0	A		5.7	A		0.0			0.0		
Intersection Delay, s/veh / LOS	5.4						A					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.8	A	0.5	A	3.3	C	3.2	C
Bicycle LOS Score / LOS	1.5	A	1.8	A				

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Michael Baker Jr			Duration, h	0.25
Analyst	ZPH	Analysis Date	Apr 29, 2014	Area Type	Other
Jurisdiction		Time Period	AM Peak	PHF	0.92
Intersection	SB ramp and WB Rt 3 Alt 1	Analysis Year	2020 Build_not Opt	Analysis Period	1 > 7:00
File Name	1B_2020B_AM_NotOpt.xus				
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h					1050						0	650

Signal Information													
Cycle, s	160.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On	Green	0.0	30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
				Red	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

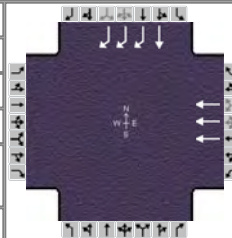
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase				6				4
Case Number				8.0				11.0
Phase Duration, s				125.0				35.0
Change Period, (Y+R _c), s				5.0				5.0
Max Allow Headway (MAH), s				0.0				3.4
Queue Clearance Time (g _s), s								27.7
Green Extension Time (g _e), s				0.0				2.3
Phase Call Probability								1.00
Max Out Probability								0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement					6						4	14
Adjusted Flow Rate (v), veh/h					1141						0	707
Adjusted Saturation Flow Rate (s), veh/h/ln					1725						1900	1425
Queue Service Time (g _s), s					11.3						0.0	25.7
Cycle Queue Clearance Time (g _c), s					11.3						0.0	25.7
Green Ratio (g/C)					0.75						0.19	0.19
Capacity (c), veh/h					3881						356	802
Volume-to-Capacity Ratio (X)					0.294						0.000	0.881
Available Capacity (c _a), veh/h					3881						1663	3741
Back of Queue (Q), veh/ln (50th percentile)					4.0						0.0	9.4
Queue Storage Ratio (RQ) (50th percentile)					0.00						0.00	0.00
Uniform Delay (d ₁), s/veh					6.4						0.0	63.3
Incremental Delay (d ₂), s/veh					0.2						0.0	1.3
Initial Queue Delay (d ₃), s/veh					0.0						0.0	0.0
Control Delay (d), s/veh					6.6						0.0	64.6
Level of Service (LOS)					A							E
Approach Delay, s/veh / LOS	0.0			6.6	A	0.0			64.6	E		
Intersection Delay, s/veh / LOS	28.8						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.0	A	2.1	B	2.0	A	2.9	C
Bicycle LOS Score / LOS			1.1	A			1.7	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Michael Baker Jr			Duration, h	0.25
Analyst	ZPH	Analysis Date	Apr 29, 2014	Area Type	Other
Jurisdiction		Time Period	PM Peak	PHF	0.92
Intersection	SB Ramp and WB Rt 3 Alt	Analysis Year	2020 Build_not opt	Analysis Period	1 > 7:00
File Name	1B_2020B_PM_NotOpt.xus				
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h					1590						0	2400

Signal Information												
Cycle, s	170.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
		Green	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Yellow	0.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Red	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

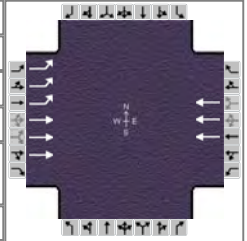
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase				6				4
Case Number				8.0				11.0
Phase Duration, s				62.5				107.5
Change Period, (Y+R _c), s				7.5				7.5
Max Allow Headway (MAH), s				0.0				3.4
Queue Clearance Time (g _s), s								102.0
Green Extension Time (g _e), s				0.0				0.0
Phase Call Probability								1.00
Max Out Probability								1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement					6						4	14
Adjusted Flow Rate (v), veh/h					1728						0	2609
Adjusted Saturation Flow Rate (s), veh/h/ln					1691						1900	1357
Queue Service Time (g _s), s					55.0						0.0	100.0
Cycle Queue Clearance Time (g _c), s					55.0						0.0	100.0
Green Ratio (g/C)					0.32						0.59	0.59
Capacity (c), veh/h					1642						1118	2395
Volume-to-Capacity Ratio (X)					1.053						0.000	1.089
Available Capacity (c _a), veh/h					1642						1118	2395
Back of Queue (Q), veh/ln (50th percentile)					29.0						0.0	42.3
Queue Storage Ratio (RQ) (50th percentile)					0.00						0.00	0.00
Uniform Delay (d ₁), s/veh					57.5						0.0	35.0
Incremental Delay (d ₂), s/veh					37.6						0.0	47.9
Initial Queue Delay (d ₃), s/veh					0.0						0.0	0.0
Control Delay (d), s/veh					95.1						0.0	82.9
Level of Service (LOS)					F							F
Approach Delay, s/veh / LOS	0.0			95.1	F	0.0			82.9	F		
Intersection Delay, s/veh / LOS	87.7						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.0	A	2.1	B	2.0	A	2.9	C
Bicycle LOS Score / LOS			1.4	A			4.8	E

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Michael Baker Jr.			Duration, h	0.25
Analyst	ZPH	Analysis Date	Apr 29, 2014	Area Type	Other
Jurisdiction		Time Period	AM Peak	PHF	0.92
Intersection	3A-AM	Analysis Year	2020 Build not Opt	Analysis Period	1 > 7:00
File Name	3A_2020B_AM_NotOpt.xus				
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	2320	1100			890							

Signal Information												
Cycle, s	160.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
		Green	87.0	58.0	0.0	0.0	0.0	0.0				
		Yellow	4.5	4.5	0.0	0.0	0.0	0.0				
		Red	3.0	3.0	0.0	0.0	0.0	0.0				

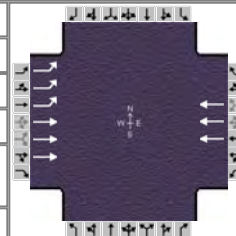
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6				
Case Number	2.0	4.0		8.3				
Phase Duration, s	94.5	160.0		65.5				
Change Period, (Y+R _c), s	7.5	7.5		7.5				
Max Allow Headway (MAH), s	3.1	0.0		0.0				
Queue Clearance Time (g _s), s	75.7							
Green Extension Time (g _e), s	11.2	0.0		0.0				
Phase Call Probability	1.00							
Max Out Probability	0.12							

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6							
Adjusted Flow Rate (v), veh/h	2522	1196			967							
Adjusted Saturation Flow Rate (s), veh/h/ln	1673	1643			1643							
Queue Service Time (g _s), s	73.7	2.4			24.9							
Cycle Queue Clearance Time (g _c), s	73.7	2.4			24.9							
Green Ratio (g/C)	0.54	0.95			0.36							
Capacity (c), veh/h	2729	4698			1788							
Volume-to-Capacity Ratio (X)	0.924	0.254			0.541							
Available Capacity (c _a), veh/h	3279	4698			1788							
Back of Queue (Q), veh/ln (50th percentile)	30.1	0.1			10.3							
Queue Storage Ratio (RQ) (50th percentile)	1.95	0.00			0.00							
Uniform Delay (d ₁), s/veh	33.5	0.2			40.4							
Incremental Delay (d ₂), s/veh	4.1	0.1			1.2							
Initial Queue Delay (d ₃), s/veh	0.0	0.0			0.0							
Control Delay (d), s/veh	37.6	0.4			41.6							
Level of Service (LOS)	D	A			D							
Approach Delay, s/veh / LOS	25.6	C		41.6	D		0.0			0.0		
Intersection Delay, s/veh / LOS	28.9						C					

Multimodal Results	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	0.5	A		2.8	C		3.2	C		3.5	D	
Bicycle LOS Score / LOS	2.5	B		1.0	A							

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Michael baker Jr.			Duration, h	0.25
Analyst	ZPH	Analysis Date	Apr 29, 2014	Area Type	Other
Jurisdiction		Time Period	PM Peak	PHF	0.92
Intersection	3A-PM	Analysis Year	2020 Build not Opt	Analysis Period	1> 7:00
File Name	3A_2020B_PM_NotOpt.xus				
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	1080	2100			1350							

Signal Information												
Cycle, s	170.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
		Green	44.0	111.0	0.0	0.0	0.0	0.0				
		Yellow	4.5	4.5	0.0	0.0	0.0	0.0				
		Red	3.0	3.0	0.0	0.0	0.0	0.0				

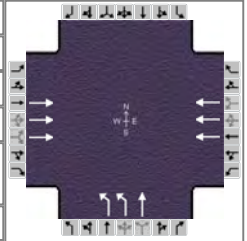
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6				
Case Number	2.0	4.0		8.3				
Phase Duration, s	51.5	170.0		118.5				
Change Period, (Y+R _c), s	7.5	7.5		7.5				
Max Allow Headway (MAH), s	3.1	0.0		0.0				
Queue Clearance Time (g _s), s	40.5							
Green Extension Time (g _e), s	3.5	0.0		0.0				
Phase Call Probability	1.00							
Max Out Probability	0.00							

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6							
Adjusted Flow Rate (v), veh/h	1174	2283			1467							
Adjusted Saturation Flow Rate (s), veh/h/ln	1673	1643			1643							
Queue Service Time (g _s), s	38.5	6.5			25.0							
Cycle Queue Clearance Time (g _c), s	38.5	6.5			25.0							
Green Ratio (g/C)	0.26	0.96			0.65							
Capacity (c), veh/h	1299	4712			3219							
Volume-to-Capacity Ratio (X)	0.904	0.484			0.456							
Available Capacity (c _a), veh/h	4385	4712			3219							
Back of Queue (Q), veh/ln (50th percentile)	16.4	0.2			9.4							
Queue Storage Ratio (RQ) (50th percentile)	1.07	0.00			0.00							
Uniform Delay (d ₁), s/veh	61.0	0.3			14.6							
Incremental Delay (d ₂), s/veh	1.0	0.4			0.5							
Initial Queue Delay (d ₃), s/veh	0.0	0.0			0.0							
Control Delay (d), s/veh	62.0	0.7			15.0							
Level of Service (LOS)	E	A			B							
Approach Delay, s/veh / LOS	21.5	C		15.0	B		0.0			0.0		
Intersection Delay, s/veh / LOS	19.6						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	0.5	A	2.8	C	3.2	C	3.5	D
Bicycle LOS Score / LOS	2.4	B	1.3	A				

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Michael Baker Jr			Duration, h	0.25
Analyst	ZPH	Analysis Date	Apr 29, 2014	Area Type	Other
Jurisdiction		Time Period	AM Peak	PHF	0.92
Intersection	4A-AM	Analysis Year	2020 Build NOt Opt	Analysis Period	1> 7:00
File Name	4A_2020B_AM_NotOpt.xus				
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h		1100			890		310	0				

Signal Information												
Cycle, s	160.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
		Green	126.5	18.5	0.0	0.0	0.0	0.0				
		Yellow	4.5	4.5	0.0	0.0	0.0	0.0				
		Red	3.0	3.0	0.0	0.0	0.0	0.0				

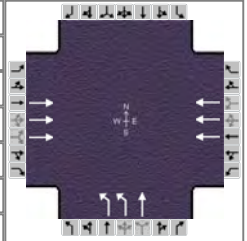
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		8		
Case Number		8.0		8.0		10.0		
Phase Duration, s		134.0		134.0		26.0		
Change Period, (Y+R _c), s		7.5		7.5		7.5		
Max Allow Headway (MAH), s		0.0		0.0		3.1		
Queue Clearance Time (g _s), s						17.7		
Green Extension Time (g _e), s		0.0		0.0		0.8		
Phase Call Probability						1.00		
Max Out Probability						0.00		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2			6		3	8				
Adjusted Flow Rate (v), veh/h		1196			967		337	0				
Adjusted Saturation Flow Rate (s), veh/h/ln		1643			1643		1689	1827				
Queue Service Time (g _s), s		10.7			8.2		15.7	0.0				
Cycle Queue Clearance Time (g _c), s		10.7			8.2		15.7	0.0				
Green Ratio (g/C)		0.79			0.79		0.12	0.12				
Capacity (c), veh/h		3898			3898		390	211				
Volume-to-Capacity Ratio (X)		0.307			0.248		0.864	0.000				
Available Capacity (c _a), veh/h		3898			3898		919	497				
Back of Queue (Q), veh/ln (50th percentile)		3.3			2.5		6.9	0.0				
Queue Storage Ratio (RQ) (50th percentile)		0.00			0.00		0.00	0.00				
Uniform Delay (d ₁), s/veh		4.6			4.4		69.5	0.0				
Incremental Delay (d ₂), s/veh		0.2			0.2		2.3	0.0				
Initial Queue Delay (d ₃), s/veh		0.0			0.0		0.0	0.0				
Control Delay (d), s/veh		4.8			4.5		71.8	0.0				
Level of Service (LOS)		A			A		E					
Approach Delay, s/veh / LOS	4.8	A		4.5	A		71.8	E		0.0		
Intersection Delay, s/veh / LOS	13.7						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.8	A	1.8	A	3.2	C	3.2	C
Bicycle LOS Score / LOS	1.1	A	1.0	A	1.0	A		

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Michael Baker Jr, Inc			Duration, h	0.25
Analyst	ZPH	Analysis Date	Apr 29, 2014	Area Type	Other
Jurisdiction		Time Period	PM Peak	PHF	0.92
Intersection	4A-PM	Analysis Year	2020 Build	Analysis Period	1 > 7:00
File Name	4A_2020B_PM_NotOpt.xus				
Project Description					



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h		2100			1350		540	0				

Signal Information												
Cycle, s	170.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
		Green	122.6	32.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Yellow	4.5	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Red	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

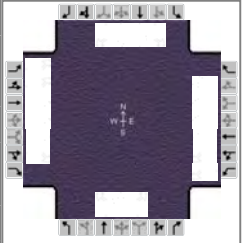
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		8		
Case Number		8.0		8.0		10.0		
Phase Duration, s		130.1		130.1		39.9		
Change Period, (Y+R _c), s		7.5		7.5		7.5		
Max Allow Headway (MAH), s		0.0		0.0		3.1		
Queue Clearance Time (g _s), s						30.9		
Green Extension Time (g _e), s		0.0		0.0		1.5		
Phase Call Probability						1.00		
Max Out Probability						0.00		

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2			6		3	8				
Adjusted Flow Rate (v), veh/h		2283			1467		587	0				
Adjusted Saturation Flow Rate (s), veh/h/ln		1643			1643		1689	1827				
Queue Service Time (g _s), s		40.9			20.1		28.9	0.0				
Cycle Queue Clearance Time (g _c), s		40.9			20.1		28.9	0.0				
Green Ratio (g/C)		0.72			0.72		0.19	0.19				
Capacity (c), veh/h		3554			3554		644	348				
Volume-to-Capacity Ratio (X)		0.642			0.413		0.911	0.000				
Available Capacity (c _a), veh/h		3554			3554		1640	887				
Back of Queue (Q), veh/ln (50th percentile)		14.6			7.1		12.7	0.0				
Queue Storage Ratio (RQ) (50th percentile)		0.00			0.00		0.00	0.00				
Uniform Delay (d ₁), s/veh		12.3			9.4		67.4	0.0				
Incremental Delay (d ₂), s/veh		0.9			0.4		2.2	0.0				
Initial Queue Delay (d ₃), s/veh		0.0			0.0		0.0	0.0				
Control Delay (d), s/veh		13.2			9.8		69.6	0.0				
Level of Service (LOS)		B			A		E					
Approach Delay, s/veh / LOS	13.2	B		9.8	A		69.6	E		0.0		
Intersection Delay, s/veh / LOS	19.7						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.9	A	1.9	A	3.2	C	3.2	C
Bicycle LOS Score / LOS	1.7	A	1.3	A	1.5	A		

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{1_am} Rte 3 @ Central Pa	Analysis Year	2040 No Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	1_2040NB_AM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	360	3600	70	130	1630	40	10	40	220	10	20	110

Signal Information				Signal Phases									
Cycle, s	160.0	Reference Phase	2										
Offset, s	0	Reference Point	End	Green	27.5	59.5	12.5	14.0	10.0	0.0	0.0	0.0	0.0
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.5	4.5	4.5	4.0	4.0	0.0	0.0	0.0	0.0
Force Mode	Fixed	Simult. Gap N/S	On	Red	3.0	3.0	3.0	3.0	3.0	0.0	0.0	0.0	0.0

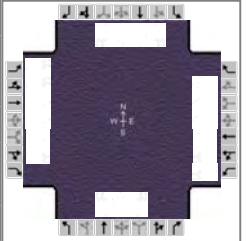
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	4.0		9.0		9.0
Phase Duration, s	35.0	102.0	20.0	87.0		21.0		17.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.0		3.0
Queue Clearance Time (g _s), s	18.3		8.1			18.0		12.9
Green Extension Time (g _e), s	0.5	0.0	2.1	0.0		0.0		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.00		0.71			1.00		1.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	375	3750	68	135	1310	429	10	42	213	10	21	106
Adjusted Saturation Flow Rate (s), veh/h/ln	1740	1691	1594	1658	1810	1778	1810	1845	1563	1757	1696	1548
Queue Service Time (g _s), s	16.3	0.0	0.0	6.1	9.4	11.4	0.8	3.3	16.0	0.9	0.9	10.9
Cycle Queue Clearance Time (g _c), s	16.3	0.0	0.0	6.1	9.4	11.4	0.8	3.3	16.0	0.9	0.9	10.9
Green Ratio (g/C)	0.18	0.61	0.61	0.09	0.51	0.51	0.10	0.10	0.10	0.08	0.08	0.08
Capacity (c), veh/h	631	3076	967	290	2782	884	181	184	156	132	254	116
Volume-to-Capacity Ratio (X)	0.595	1.219	0.070	0.467	0.471	0.486	0.058	0.226	1.359	0.079	0.082	0.915
Available Capacity (c _a), veh/h	631	3076	967	290	2782	884	181	184	156	132	254	116
Back of Queue (Q), veh/ln (50th percentile)	7.6	29.0	0.0	2.6	2.8	3.7	0.4	1.6	15.0	0.4	0.4	6.2
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	64.8	0.0	0.0	67.2	6.6	8.1	65.2	66.3	72.0	68.9	68.9	73.5
Incremental Delay (d ₂), s/veh	1.1	101.7	0.1	0.4	0.5	1.8	0.0	0.2	197.4	0.1	0.1	56.7
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	65.8	101.7	0.1	67.6	7.1	9.8	65.2	66.5	269.4	69.0	68.9	130.2
Level of Service (LOS)	E	F	A	E	A	A	E	E	F	E	E	F
Approach Delay, s/veh / LOS	96.9		F	12.1		B	229.4		F	116.3		F
Intersection Delay, s/veh / LOS	78.1						E					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.9	C	3.0	C	3.5	D	3.8	D
Bicycle LOS Score / LOS	2.8	C	1.3	A	0.9	A	0.6	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{1_pm} Rte 3 @ Central Pa	Analysis Year	2040 No Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	1_2040NB_PM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	440	2250	140	680	3280	90	110	140	550	140	250	510

Signal Information				Signal Phases											
Cycle, s	170.0	Reference Phase	2												
Offset, s	0	Reference Point	End	Green	25.5	42.5	33.5	14.0	18.0	0.0					
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.5	4.5	4.5	4.0	4.0	0.0					
Force Mode	Fixed	Simult. Gap N/S	On	Red	3.0	3.0	3.0	3.0	3.0	0.0					

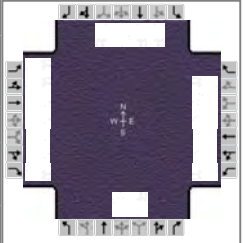
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	4.0		9.0		9.0
Phase Duration, s	33.0	83.0	41.0	91.0		21.0		25.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.0		3.0
Queue Clearance Time (g _s), s	23.4		36.0			18.0		22.0
Green Extension Time (g _e), s	0.2	0.0	0.0	0.0		0.0		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	1.00		1.00			1.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	458	2344	135	708	2637	873	115	146	532	146	260	494
Adjusted Saturation Flow Rate (s), veh/h/ln	1757	1675	1594	1757	1863	1827	1810	1900	1610	1792	1900	1610
Queue Service Time (g _s), s	21.4	78.0	12.6	34.0	59.0	66.1	10.4	12.8	16.0	13.3	11.0	20.0
Cycle Queue Clearance Time (g _c), s	21.4	78.0	12.6	34.0	59.0	66.1	10.4	12.8	16.0	13.3	11.0	20.0
Green Ratio (g/C)	0.16	0.46	0.46	0.21	0.51	0.51	0.09	0.09	0.09	0.12	0.12	0.12
Capacity (c), veh/h	558	2306	731	723	2827	898	170	179	152	211	447	189
Volume-to-Capacity Ratio (X)	0.821	1.017	0.185	0.979	0.933	0.973	0.673	0.816	3.512	0.692	0.583	2.606
Available Capacity (c _a), veh/h	558	2306	731	723	2827	898	170	179	152	211	447	189
Back of Queue (Q), veh/ln (50th percentile)	10.4	40.3	5.6	16.6	11.7	20.6	5.3	7.4	55.0	6.6	5.5	47.2
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	69.2	72.0	44.3	61.3	12.0	14.6	74.5	75.6	77.0	72.0	71.0	75.0
Incremental Delay (d ₂), s/veh	8.9	23.0	0.6	18.5	3.8	15.5	8.2	23.0	1147.0	7.9	1.3	738.0
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	78.1	95.0	44.9	79.8	15.8	30.1	82.7	98.6	1224.0	79.9	72.3	813.0
Level of Service (LOS)	E	F	D	E	B	C	F	F	F	E	E	F
Approach Delay, s/veh / LOS	90.0		F	29.5		C	852.0		F	479.9		F
Intersection Delay, s/veh / LOS	169.1						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.9	C	3.0	C	3.5	D	3.8	D
Bicycle LOS Score / LOS	2.1	B	2.2	B	1.8	A	1.2	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{2_} Rte 3 @ Carl D Silv	Analysis Year	2040 No Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	2_2040NB_AM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	200	3980	20	30	1510	630	20	10	30	480	10	80

Signal Information				Signal Phases										
Cycle, s	160.0	Reference Phase	2											
Offset, s	0	Reference Point	End	Green	24.5	50.5	9.5	10.0	29.0	0.0	1	2	3	4
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.5	4.5	4.5	4.0	4.0	0.0	5	6	7	8
Force Mode	Fixed	Simult. Gap N/S	On	Red	3.0	3.0	3.0	3.0	3.0	0.0				

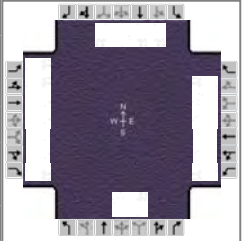
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	3.0		11.0		9.0
Phase Duration, s	32.0	90.0	17.0	75.0		17.0		36.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.1		2.8
Queue Clearance Time (g _s), s	10.8		4.7			5.0		23.1
Green Extension Time (g _e), s	0.3	0.0	2.7	0.0		0.0		0.7
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.00		0.73			0.05		0.12

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	208	4146	20	31	1573	656		31	29	500	10	77
Adjusted Saturation Flow Rate (s), veh/h/ln	1757	1708	1533	1774	1827	1579		1839	1464	1774	1900	1610
Queue Service Time (g _s), s	8.8	85.0	1.3	2.7	24.7	64.0		2.6	3.0	21.1	0.7	6.5
Cycle Queue Clearance Time (g _c), s	8.8	85.0	1.3	2.7	24.7	64.0		2.6	3.0	21.1	0.7	6.5
Green Ratio (g/C)	0.16	0.53	0.53	0.08	0.44	0.44		0.08	0.08	0.20	0.20	0.20
Capacity (c), veh/h	571	3630	815	133	3197	691		138	110	699	374	317
Volume-to-Capacity Ratio (X)	0.365	1.142	0.024	0.235	0.492	0.950		0.227	0.266	0.716	0.028	0.243
Available Capacity (c _a), veh/h	571	3630	815	133	3197	691		115	110	699	374	317
Back of Queue (Q), veh/ln (50th percentile)	4.1	45.4	0.5	1.2	11.2	29.4		1.2	1.2	9.8	0.3	2.7
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	63.7	23.3	24.7	69.7	33.0	43.3		71.2	69.8	60.1	51.9	54.2
Incremental Delay (d ₂), s/veh	0.1	67.7	0.1	0.3	0.5	24.0		0.3	0.5	3.0	0.0	0.1
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	63.8	91.1	24.7	70.0	33.6	67.3		71.5	70.3	63.1	51.9	54.3
Level of Service (LOS)	E	F	C	E	C	E		E	E	E	D	D
Approach Delay, s/veh / LOS	89.5		F	43.9		D	70.9		E	61.7		E
Intersection Delay, s/veh / LOS	72.9						E					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	3.0	C	3.8	D	3.9	D
Bicycle LOS Score / LOS	2.3	B	1.4	A	0.6	A	1.5	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{2_pm} Rte 3 @ Carl D Silv	Analysis Year	2040 No Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	2_2040NB_PM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	380	2530	20	50	3770	1300	30	10	40	1170	20	430

Signal Information				Signal Phases										
Cycle, s	170.0	Reference Phase	2											
Offset, s	0	Reference Point	End	Green	34.5	43.5	9.5	10.0	36.0	0.0	1	2	3	4
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.5	4.5	4.5	4.0	4.0	0.0	5	6	7	8
Force Mode	Fixed	Simult. Gap N/S	On	Red	3.0	3.0	3.0	3.0	3.0	0.0				

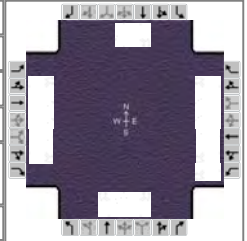
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	3.0		11.0		9.0
Phase Duration, s	42.0	93.0	17.0	68.0		17.0		43.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.1		2.9
Queue Clearance Time (g _s), s	19.8		6.9			6.0		40.5
Green Extension Time (g _e), s	0.7	0.0	2.5	0.0		0.0		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.00		1.00			0.26		1.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	396	2635	20	52	3927	1354		42	39	1219	21	417
Adjusted Saturation Flow Rate (s), veh/h/ln	1757	1691	1610	1723	1881	1610		1761	1579	1810	1900	1610
Queue Service Time (g _s), s	17.8	25.9	0.3	4.9	63.0	63.0		3.9	4.0	38.5	1.5	38.5
Cycle Queue Clearance Time (g _c), s	17.8	25.9	0.3	4.9	63.0	63.0		3.9	4.0	38.5	1.5	38.5
Green Ratio (g/C)	0.21	0.52	0.52	0.07	0.37	0.37		0.07	0.07	0.23	0.23	0.23
Capacity (c), veh/h	744	3502	833	122	2789	597		124	111	820	430	365
Volume-to-Capacity Ratio (X)	0.532	0.753	0.024	0.428	1.408	2.269		0.335	0.346	1.487	0.048	1.143
Available Capacity (c _a), veh/h	744	3502	833	122	2789	597		104	111	820	430	365
Back of Queue (Q), veh/ln (50th percentile)	8.3	4.6	0.1	2.2	65.7	121.0		1.8	1.6	43.5	0.7	25.2
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	65.2	7.7	5.6	75.7	53.5	53.5		76.9	75.3	65.8	51.4	65.8
Incremental Delay (d ₂), s/veh	0.4	1.5	0.1	0.9	185.9	576.6		0.6	0.7	225.7	0.0	91.8
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	65.6	9.2	5.7	76.6	239.4	630.1		77.5	75.9	291.4	51.4	157.6
Level of Service (LOS)	E	A	A	E	F	F		E	E	F	D	F
Approach Delay, s/veh / LOS	16.5		B	337.0		F	76.7		E	254.7		F
Intersection Delay, s/veh / LOS	224.9						F					

Multimodal Results	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	2.3		B	3.0		C	3.8		D	3.9		D
Bicycle LOS Score / LOS	1.7		A	2.7		B	0.6		A	3.2		C

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{3_} Rte 3 @ Gateway E	Analysis Year	2040 No Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	3_2040NB_AM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	40	1710	430	140	1800	10	310	10	140	10	5	30

Signal Information														
Cycle, s	114.0	Reference Phase	2											
Offset, s	0	Reference Point	End											
Uncoordinated	No	Simult. Gap E/W	On	Green	10.0	31.5	10.0	19.5	7.5	0.0				
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	3.5	4.0	4.5	4.5	0.0				
				Red	3.0	3.0	3.0	3.0	3.0	0.0				

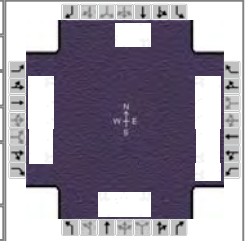
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	3.0		9.0		10.0
Phase Duration, s	17.0	55.0	17.0	55.0		27.0		15.0
Change Period, (Y+R _c), s	7.0	6.5	7.0	7.0		7.5		7.5
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		2.9		3.3
Queue Clearance Time (g _s), s	4.4		6.5			22.4		4.4
Green Extension Time (g _e), s	0.0	0.0	2.1	0.0		0.0		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.00		0.87			1.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	42	1781	414	146	1875	9	323	10	134	10	36	
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1675	1533	1706	1597	1610	1792	1900	1533	1691	1646	
Queue Service Time (g _s), s	2.4	34.0	22.9	4.5	19.8	0.1	20.4	0.5	8.9	0.7	2.4	
Cycle Queue Clearance Time (g _c), s	2.4	34.0	22.9	4.5	19.8	0.1	20.4	0.5	8.9	0.7	2.4	
Green Ratio (g/C)	0.10	0.46	0.46	0.10	0.45	0.45	0.18	0.18	0.18	0.08	0.08	
Capacity (c), veh/h	183	2292	699	344	2165	727	330	350	282	134	108	
Volume-to-Capacity Ratio (X)	0.228	0.777	0.591	0.424	0.866	0.013	0.978	0.030	0.476	0.078	0.337	
Available Capacity (c _a), veh/h	183	2292	699	344	2165	727	330	350	282	134	108	
Back of Queue (Q), veh/ln (50th percentile)	1.1	13.7	8.8	1.9	2.7	0.0	13.0	0.2	3.4	0.3	1.0	
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Uniform Delay (d ₁), s/veh	47.2	27.5	23.1	46.3	4.5	3.0	46.3	38.1	41.6	48.7	50.1	
Incremental Delay (d ₂), s/veh	0.2	2.7	3.6	0.3	5.0	0.0	43.4	0.0	0.5	0.1	0.7	
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	47.4	30.1	26.7	46.6	9.4	3.1	89.7	38.2	42.0	48.7	50.7	
Level of Service (LOS)	D	C	C	D	A	A	F	D	D	D	D	
Approach Delay, s/veh / LOS	29.8	C		12.1	B		74.9	E		50.3	D	
Intersection Delay, s/veh / LOS	26.9						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.9	C	2.3	B	3.5	D	3.4	C
Bicycle LOS Score / LOS	1.7	A	1.6	A	1.3	A	0.6	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{3_} Rte 3 @ Gateway E	Analysis Year	2040 No Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	3_2040NB_PM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	40	1970	600	290	1820	0	400	5	280	10	5	5

Signal Information				Signal Timing (s)										
Cycle, s	114.0	Reference Phase	2	Green	10.0	31.5	10.0	19.5	7.5	0.0	1	2	3	4
Offset, s	0	Reference Point	End	Yellow	4.0	3.5	4.0	4.5	4.5	0.0	5	6	7	8
Uncoordinated	No	Simult. Gap E/W	On	Red	3.0	3.0	3.0	3.0	3.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On											

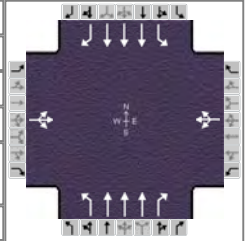
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	3.0		9.0		10.0
Phase Duration, s	17.0	55.0	17.0	55.0		27.0		15.0
Change Period, (Y+R _c), s	7.0	6.5	7.0	7.0		7.5		7.5
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		2.9		3.0
Queue Clearance Time (g _s), s	4.4		11.9			23.0		2.7
Green Extension Time (g _e), s	0.0	0.0	0.0	0.0		0.0		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.00		1.00			1.00		0.02

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	42	2052	591	302	1896	0	417	5	280	10	10	
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1675	1533	1706	1597	1610	1792	1900	1533	1691	1743	
Queue Service Time (g _s), s	2.4	42.8	38.8	9.9	20.8	0.0	21.0	0.3	20.8	0.7	0.6	
Cycle Queue Clearance Time (g _c), s	2.4	42.8	38.8	9.9	20.8	0.0	21.0	0.3	20.8	0.7	0.6	
Green Ratio (g/C)	0.10	0.46	0.46	0.10	0.45	0.45	0.18	0.18	0.18	0.08	0.08	
Capacity (c), veh/h	183	2292	699	344	2165	727	330	350	282	134	115	
Volume-to-Capacity Ratio (X)	0.228	0.895	0.844	0.878	0.876	0.000	1.263	0.015	0.992	0.078	0.091	
Available Capacity (c _a), veh/h	183	2292	699	344	2165	727	330	350	282	134	115	
Back of Queue (Q), veh/ln (50th percentile)	1.1	17.8	16.1	5.1	2.8	0.0	22.1	0.1	11.9	0.3	0.3	
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Uniform Delay (d ₁), s/veh	47.2	30.1	27.4	48.6	4.6	0.0	46.5	38.0	46.4	48.7	49.0	
Incremental Delay (d ₂), s/veh	0.2	6.0	11.9	21.0	5.3	0.0	140.2	0.0	51.2	0.1	0.1	
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	47.4	36.0	39.3	69.7	9.9	0.0	186.7	38.0	97.6	48.7	49.1	
Level of Service (LOS)	D	D	D	E	A		F	D	F	D	D	
Approach Delay, s/veh / LOS	36.9		D	18.1		B	150.0		F	48.9		D
Intersection Delay, s/veh / LOS	43.8						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.9	C	2.3	B	3.5	D	3.4	C
Bicycle LOS Score / LOS	2.0	A	1.7	A	1.6	A	0.5	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{4_am} Rte 17 @ McLane I	Analysis Year	2040 No Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	4_2040NB_AM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	30	10	10	50	5	20	30	3670	60	40	2960	40

Signal Information													
Cycle, s	130.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On	Green	10.5	60.5	38.5	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.5	4.5	3.5	0.0	0.0	0.0			
				Red	3.0	3.0	3.0	0.0	0.0	0.0			

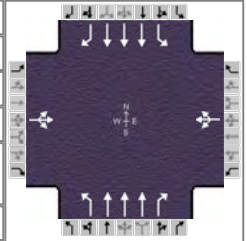
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		8.0		8.0	2.0	3.0	2.0	3.0
Phase Duration, s		45.0		45.0	17.0	68.0	17.0	68.0
Change Period, (Y+R _c), s		6.5		6.5	6.5	7.5	6.5	7.5
Max Allow Headway (MAH), s		3.2		3.2	2.8	0.0	2.8	0.0
Queue Clearance Time (g _s), s		4.9		6.5	4.2		4.9	
Green Extension Time (g _e), s		0.2		0.2	0.0	0.0	0.0	0.0
Phase Call Probability		1.00		1.00	1.00		1.00	
Max Out Probability		0.00		0.00	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	52			78			31	3823	59	42	3083	40
Adjusted Saturation Flow Rate (s), veh/h/ln	1487			1458			1740	1659	1548	1740	1659	1548
Queue Service Time (g _s), s	0.0			1.6			2.2	63.0	0.2	2.9	63.0	1.8
Cycle Queue Clearance Time (g _c), s	2.9			4.5			2.2	63.0	0.2	2.9	63.0	1.8
Green Ratio (g/C)	0.32			0.32			0.09	0.48	0.48	0.10	0.48	0.48
Capacity (c), veh/h	485			478			161	2412	750	174	2412	750
Volume-to-Capacity Ratio (X)	0.107			0.163			0.195	1.585	0.079	0.239	1.278	0.053
Available Capacity (c _a), veh/h	485			478			161	2412	750	174	2412	750
Back of Queue (Q), veh/ln (50th percentile)	1.2			1.8			1.0	68.1	0.1	1.3	53.2	0.7
Queue Storage Ratio (RQ) (50th percentile)	0.00			0.00			0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	33.0			33.6			54.5	12.5	1.0	53.9	33.5	17.7
Incremental Delay (d ₂), s/veh	0.0			0.1			0.2	265.3	0.2	0.3	128.7	0.1
Initial Queue Delay (d ₃), s/veh	0.0			0.0			0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	33.1			33.7			54.8	277.8	1.2	54.2	162.2	17.9
Level of Service (LOS)	C			C			D	F	A	D	F	B
Approach Delay, s/veh / LOS	33.1	C		33.7	C		271.8	F		158.9	F	
Intersection Delay, s/veh / LOS	218.0						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.4	C	3.4	C	2.1	B	2.1	B
Bicycle LOS Score / LOS	0.6	A	0.6	A	2.6	B	2.2	B

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{4_pm} Rte 17 @ McLane I	Analysis Year	2040 No Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	4_2040NB_PM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	20	5	10	60	10	30	20	3110	30	20	3890	30

Signal Information													
Cycle, s	160.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On	Green	10.5	90.5	38.5	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.5	4.5	3.5	0.0	0.0	0.0			
				Red	3.0	3.0	3.0	0.0	0.0	0.0			

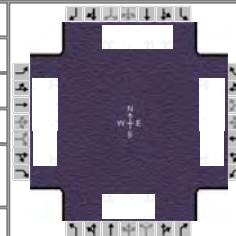
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		8.0		8.0	2.0	3.0	2.0	3.0
Phase Duration, s		45.0		45.0	17.0	98.0	17.0	98.0
Change Period, (Y+R _c), s		6.5		6.5	6.5	7.5	6.5	7.5
Max Allow Headway (MAH), s		3.2		3.2	2.8	0.0	2.8	0.0
Queue Clearance Time (g _s), s		4.9		10.7	3.8		3.8	
Green Extension Time (g _e), s		0.3		0.3	0.0	0.0	0.0	0.0
Phase Call Probability		1.00		1.00	1.00		1.00	
Max Out Probability		0.00		0.00	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	36			104			21	3240	28	21	4052	29
Adjusted Saturation Flow Rate (s), veh/h/ln	1442			1478			1740	1659	1548	1740	1659	1548
Queue Service Time (g _s), s	0.0			5.7			1.8	93.0	0.0	1.8	93.0	1.3
Cycle Queue Clearance Time (g _c), s	2.9			8.7			1.8	93.0	0.0	1.8	93.0	1.3
Green Ratio (g/C)	0.26			0.26			0.08	0.58	0.58	0.08	0.58	0.58
Capacity (c), veh/h	382			392			130	2893	900	141	2893	900
Volume-to-Capacity Ratio (X)	0.095			0.266			0.160	1.120	0.031	0.147	1.401	0.032
Available Capacity (c _a), veh/h	382			392			130	2893	900	141	2893	900
Back of Queue (Q), veh/ln (50th percentile)	1.2			3.4			0.8	17.1	0.0	0.8	85.1	0.5
Queue Storage Ratio (RQ) (50th percentile)	0.00			0.00			0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	47.0			49.2			69.3	2.5	0.0	68.3	33.5	14.3
Incremental Delay (d ₂), s/veh	0.0			0.1			0.2	59.3	0.1	0.2	182.5	0.1
Initial Queue Delay (d ₃), s/veh	0.0			0.0			0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	47.1			49.3			69.5	61.8	0.1	68.5	216.0	14.4
Level of Service (LOS)	D			D			E	F	A	E	F	B
Approach Delay, s/veh / LOS	47.1	D		49.3	D		61.3	E		213.8	F	
Intersection Delay, s/veh / LOS	144.1						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.4	C	3.4	C	2.1	B	2.1	B
Bicycle LOS Score / LOS	0.5	A	0.7	A	2.3	B	2.7	B

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{5_am} Rte 17 @ Sanford I	Analysis Year	2040 No Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	5_2040NB_AM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	20	2950	30	310	3620	340	90	10	230	230	100	30

Signal Information													
Cycle, s	130.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On	Green	9.5	39.5	23.5	11.0	10.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.5	4.5	4.5	4.0	4.0	0.0			
				Red	3.0	3.0	3.0	3.0	3.0	0.0			

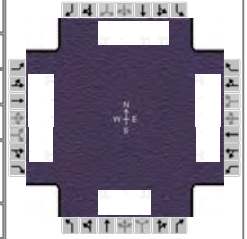
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	3.0		9.0		9.0
Phase Duration, s	31.0	78.0	17.0	64.0		18.0		17.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.0		2.9
Queue Clearance Time (g _s), s	3.3		13.5			15.0		11.0
Green Extension Time (g _e), s	11.2	0.0	0.0	0.0		0.0		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.34		1.00			1.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	21	3073	29	323	3771	339	94	10	215	240	104	29
Adjusted Saturation Flow Rate (s), veh/h/ln	1740	1659	1548	1740	1659	1548	1740	1827	1548	1689	1827	1548
Queue Service Time (g _s), s	1.3	70.5	1.1	11.5	56.5	20.0	6.8	0.7	13.0	9.0	7.1	2.3
Cycle Queue Clearance Time (g _c), s	1.3	70.5	1.1	11.5	56.5	20.0	6.8	0.7	13.0	9.0	7.1	2.3
Green Ratio (g/C)	0.18	0.54	0.54	0.09	0.43	0.43	0.10	0.10	0.10	0.10	0.10	0.10
Capacity (c), veh/h	315	2699	840	154	2163	697	147	183	155	312	176	119
Volume-to-Capacity Ratio (X)	0.066	1.139	0.035	2.098	1.743	0.486	0.637	0.057	1.386	0.768	0.593	0.245
Available Capacity (c _a), veh/h	315	2699	840	154	2163	697	147	183	155	312	176	119
Back of Queue (Q), veh/ln (50th percentile)	0.6	43.6	0.4	27.1	89.7	7.8	3.8	0.3	14.1	4.6	4.0	1.1
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	44.2	29.8	13.9	59.3	36.8	25.2	57.6	53.9	58.5	57.6	56.5	56.4
Incremental Delay (d ₂), s/veh	0.4	67.4	0.1	515.5	336.5	2.4	19.2	0.6	208.5	16.5	13.9	4.8
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	44.6	97.2	14.0	574.8	373.2	27.6	76.8	54.4	267.0	74.1	70.4	61.3
Level of Service (LOS)	D	F	B	F	F	C	E	D	F	E	E	E
Approach Delay, s/veh / LOS	96.1		F	361.5		F	204.1		F	72.1		E
Intersection Delay, s/veh / LOS	241.8						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.4	B	2.6	B	3.4	C	3.4	C
Bicycle LOS Score / LOS	2.2	B	2.9	C	1.0	A	1.1	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{5_pm} Rte 17 @ Sanford I	Analysis Year	2040 No Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	5_2040NB_PM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	10	3660	70	370	2960	300	50	10	950	510	30	10

Signal Information													
Cycle, s	160.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On	Green	22.5	50.5	17.5	11.0	22.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.5	4.5	4.5	4.0	4.0	0.0			
				Red	3.0	3.0	3.0	3.0	3.0	0.0			

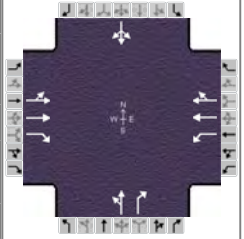
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	3.0		9.0		9.0
Phase Duration, s	25.0	83.0	30.0	88.0		18.0		29.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.0		2.8
Queue Clearance Time (g _s), s	2.9		26.5			15.0		26.0
Green Extension Time (g _e), s	12.0	0.0	0.0	0.0		0.0		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.75		1.00			1.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	10	3813	69	385	3083	304	52	10	903	531	31	9
Adjusted Saturation Flow Rate (s), veh/h/ln	1740	1659	1548	1740	1659	1548	1740	1827	1548	1689	1827	1548
Queue Service Time (g _s), s	0.9	75.5	3.9	24.5	80.5	18.9	4.6	0.8	13.0	24.0	2.4	0.8
Cycle Queue Clearance Time (g _c), s	0.9	75.5	3.9	24.5	80.5	18.9	4.6	0.8	13.0	24.0	2.4	0.8
Green Ratio (g/C)	0.11	0.47	0.47	0.15	0.50	0.50	0.08	0.08	0.08	0.15	0.15	0.15
Capacity (c), veh/h	190	2348	731	266	2504	798	120	148	126	507	280	213
Volume-to-Capacity Ratio (X)	0.055	1.624	0.094	1.447	1.231	0.381	0.435	0.070	7.179	1.048	0.112	0.044
Available Capacity (c _a), veh/h	190	2348	731	266	2504	798	120	148	126	507	280	213
Back of Queue (Q), veh/ln (50th percentile)	0.4	91.9	1.5	27.3	57.2	7.4	2.4	0.4	102.9	14.1	1.2	0.4
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	63.8	42.3	23.4	67.8	39.8	23.4	71.5	68.8	73.5	68.0	58.6	59.9
Incremental Delay (d ₂), s/veh	0.5	282.6	0.3	220.9	107.8	1.4	11.1	0.9	2797.2	53.2	0.8	0.4
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	64.4	324.8	23.6	288.6	147.6	24.7	82.6	69.7	2870.7	121.2	59.4	60.3
Level of Service (LOS)	E	F	C	F	F	C	F	E	F	F	E	E
Approach Delay, s/veh / LOS	318.8		F	152.1		F	2690.1		F	116.8		F
Intersection Delay, s/veh / LOS	486.7						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.6	B	2.6	B	3.4	C	3.4	C
Bicycle LOS Score / LOS	2.6	B	2.6	B	2.1	B	1.4	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{6_am} Rte 17 @ Short St	Analysis Year	2040 No Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	6_2040NB_AM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	10	1570	70	20	1650	5	130	0	20	5	0	20

Signal Information																		
Cycle, s	100.0	Reference Phase	2															
Offset, s	0	Reference Point	End															
Uncoordinated	No	Simult. Gap E/W	On	Green	10.0	32.5	19.0	10.0	0.0	0.0	1		2		3		4	
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.5	4.0	4.0	0.0	0.0	5		6		7		8	
				Red	3.0	3.0	3.0	3.0	0.0	0.0								

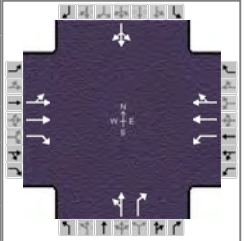
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6		8		4
Case Number		7.3	1.0	4.0		11.0		12.0
Phase Duration, s		40.0	17.0	57.0		26.0		17.0
Change Period, (Y+R _c), s		7.5	7.0	7.5		7.0		7.0
Max Allow Headway (MAH), s		0.0	2.8	0.0		3.1		3.3
Queue Clearance Time (g _s), s			2.6			8.6		3.4
Green Extension Time (g _e), s		0.0	0.0	0.0		0.2		0.0
Phase Call Probability			1.00			1.00		1.00
Max Out Probability			0.00			0.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	808	838	68	21	862	862		135	20		26	
Adjusted Saturation Flow Rate (s), veh/h/ln	1598	1679	1579	1810	1863	1861		1810	1563		1646	
Queue Service Time (g _s), s	8.1	35.0	2.9	0.6	41.4	41.4		6.6	1.0		1.4	
Cycle Queue Clearance Time (g _c), s	32.5	35.0	2.9	0.6	41.4	41.4		6.6	1.0		1.4	
Green Ratio (g/C)	0.35	0.35	0.35	0.48	0.52	0.52		0.21	0.21		0.12	
Capacity (c), veh/h	556	588	553	280	969	921		380	328		198	
Volume-to-Capacity Ratio (X)	1.453	1.427	0.123	0.074	0.890	0.936		0.356	0.060		0.132	
Available Capacity (c _a), veh/h	556	588	553	280	969	921		344	328		165	
Back of Queue (Q), veh/ln (50th percentile)	46.3	46.6	1.1	0.2	20.0	21.3		2.9	0.4		0.6	
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		0.00	
Uniform Delay (d ₁), s/veh	32.6	32.5	22.1	20.4	22.5	21.5		35.5	31.6		41.2	
Incremental Delay (d ₂), s/veh	213.7	201.8	0.5	0.0	12.1	17.7		0.2	0.0		0.1	
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Control Delay (d), s/veh	246.2	234.3	22.5	20.5	34.6	39.1		35.7	31.6		41.3	
Level of Service (LOS)	F	F	C	C	C	D		D	C		D	
Approach Delay, s/veh / LOS	231.6	F		36.7	D		35.2	D		41.3	D	
Intersection Delay, s/veh / LOS	128.4						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.1	B	2.9	C	2.9	C
Bicycle LOS Score / LOS	1.9	A	1.9	A	0.7	A	0.5	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{6_pm} Rte 17 @ Short St	Analysis Year	2040 No Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	6_2040NB_PM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	10	2670	120	20	1450	5	110	5	40	5	5	10

Signal Information														
Cycle, s	110.0	Reference Phase	2											
Offset, s	0	Reference Point	End											
Uncoordinated	No	Simult. Gap E/W	On	Green	11.0	43.5	16.0	11.0	0.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.5	4.0	4.0	0.0	0.0				
				Red	3.0	3.0	3.0	3.0	0.0	0.0				

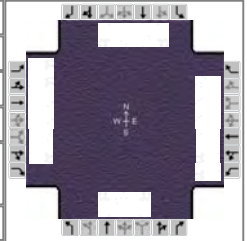
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6		8		4
Case Number		7.3	1.0	4.0		11.0		12.0
Phase Duration, s		51.0	18.0	69.0		23.0		18.0
Change Period, (Y+R _c), s		7.5	7.0	7.5		7.0		7.0
Max Allow Headway (MAH), s		0.0	2.8	0.0		3.1		3.3
Queue Clearance Time (g _s), s			2.6			8.6		3.2
Green Extension Time (g _e), s		0.0	0.0	0.0		0.2		0.0
Phase Call Probability			1.00			1.00		1.00
Max Out Probability			0.00			0.01		0.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	1462	1330	117	21	758	757		120	39		21	
Adjusted Saturation Flow Rate (s), veh/h/ln	1842	1695	1548	1757	1863	1860		1813	1610		1723	
Queue Service Time (g _s), s	16.0	46.0	5.2	0.6	31.6	31.6		6.6	2.3		1.2	
Cycle Queue Clearance Time (g _c), s	43.5	46.0	5.2	0.6	31.6	31.6		6.6	2.3		1.2	
Green Ratio (g/C)	0.42	0.42	0.42	0.54	0.58	0.58		0.16	0.16		0.12	
Capacity (c), veh/h	761	709	647	265	1084	1040		297	263		204	
Volume-to-Capacity Ratio (X)	1.920	1.876	0.180	0.079	0.700	0.728		0.404	0.146		0.102	
Available Capacity (c _a), veh/h	761	709	647	265	1084	1040		264	263		172	
Back of Queue (Q), veh/ln (50th percentile)	108.5	96.8	2.0	0.2	13.8	13.9		3.0	0.9		0.5	
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		0.00	
Uniform Delay (d ₁), s/veh	32.8	32.0	20.1	21.8	16.9	16.2		43.0	39.4		44.9	
Incremental Delay (d ₂), s/veh	418.9	399.6	0.6	0.0	3.8	4.5		0.3	0.1		0.1	
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Control Delay (d), s/veh	451.7	431.6	20.7	21.8	20.7	20.7		43.3	39.5		44.9	
Level of Service (LOS)	F	F	C	C	C	C		D	D		D	
Approach Delay, s/veh / LOS	425.2	F		20.7	C		42.4	D		44.9	D	
Intersection Delay, s/veh / LOS	276.0						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.1	B	2.9	C	2.9	C
Bicycle LOS Score / LOS	2.9	C	1.8	A	0.7	A	0.5	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{1_am} Rte 3 @ Central Pa	Analysis Year	2040 Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	1_2040B_AM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	360	3740	70	130	1630	40	10	40	220	10	20	110

Signal Information				Signal Phases											
Cycle, s	160.0	Reference Phase	2												
Offset, s	0	Reference Point	End	Green	27.5	59.5	12.5	14.0	10.0	0.0					
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.5	4.5	4.5	4.0	4.0	0.0					
Force Mode	Fixed	Simult. Gap N/S	On	Red	3.0	3.0	3.0	3.0	3.0	0.0					

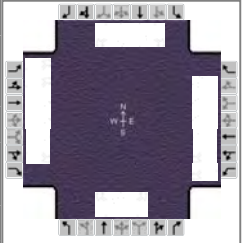
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	4.0		9.0		9.0
Phase Duration, s	35.0	102.0	20.0	87.0		21.0		17.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.0		3.0
Queue Clearance Time (g _s), s	18.3		8.1			18.0		12.9
Green Extension Time (g _e), s	0.5	0.0	2.1	0.0		0.0		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.00		0.71			1.00		1.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	375	3896	68	135	1310	429	10	42	213	10	21	106
Adjusted Saturation Flow Rate (s), veh/h/ln	1740	1691	1594	1658	1810	1778	1810	1845	1563	1757	1696	1548
Queue Service Time (g _s), s	16.3	0.0	0.0	6.1	9.4	11.4	0.8	3.3	16.0	0.9	0.9	10.9
Cycle Queue Clearance Time (g _c), s	16.3	0.0	0.0	6.1	9.4	11.4	0.8	3.3	16.0	0.9	0.9	10.9
Green Ratio (g/C)	0.18	0.61	0.61	0.09	0.51	0.51	0.10	0.10	0.10	0.08	0.08	0.08
Capacity (c), veh/h	631	3076	967	290	2782	884	181	184	156	132	254	116
Volume-to-Capacity Ratio (X)	0.595	1.266	0.070	0.467	0.471	0.486	0.058	0.226	1.359	0.079	0.082	0.915
Available Capacity (c _a), veh/h	631	3076	967	290	2782	884	181	184	156	132	254	116
Back of Queue (Q), veh/ln (50th percentile)	7.6	34.9	0.0	2.6	2.8	3.7	0.4	1.6	15.0	0.4	0.4	6.2
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	64.8	0.0	0.0	67.2	6.6	8.1	65.2	66.3	72.0	68.9	68.9	73.5
Incremental Delay (d ₂), s/veh	1.1	122.6	0.1	0.4	0.5	1.8	0.0	0.2	197.4	0.1	0.1	56.7
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	65.8	122.6	0.1	67.6	7.1	9.8	65.2	66.5	269.4	69.0	68.9	130.2
Level of Service (LOS)	E	F	A	E	A	A	E	E	F	E	E	F
Approach Delay, s/veh / LOS	115.8		F	12.1		B	229.4		F	116.3		F
Intersection Delay, s/veh / LOS	91.0						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.9	C	3.0	C	3.5	D	3.8	D
Bicycle LOS Score / LOS	2.9	C	1.3	A	0.9	A	0.6	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{1_pm} Rte 3 @ Central Pa	Analysis Year	2040 Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	1_2040B_PM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	440	2310	140	680	3280	90	110	140	550	140	250	510

Signal Information				Signal Timing (s)													
Cycle, s	170.0	Reference Phase	2	Green	25.5	42.5	33.5	14.0	18.0	0.0	Yellow	4.5	4.5	4.5	4.0	4.0	0.0
Offset, s	0	Reference Point	End	Red	3.0	3.0	3.0	3.0	3.0	0.0							
Uncoordinated	No	Simult. Gap E/W	On														
Force Mode	Fixed	Simult. Gap N/S	On														

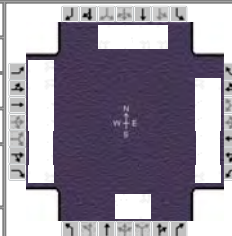
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	4.0		9.0		9.0
Phase Duration, s	33.0	83.0	41.0	91.0		21.0		25.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.0		3.0
Queue Clearance Time (g _s), s	23.4		36.0			18.0		22.0
Green Extension Time (g _e), s	0.2	0.0	0.0	0.0		0.0		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	1.00		1.00			1.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	458	2406	135	708	2637	873	115	146	532	146	260	494
Adjusted Saturation Flow Rate (s), veh/h/ln	1757	1675	1594	1757	1863	1827	1810	1900	1610	1792	1900	1610
Queue Service Time (g _s), s	21.4	78.0	12.6	34.0	59.0	66.1	10.4	12.8	16.0	13.3	11.0	20.0
Cycle Queue Clearance Time (g _c), s	21.4	78.0	12.6	34.0	59.0	66.1	10.4	12.8	16.0	13.3	11.0	20.0
Green Ratio (g/C)	0.16	0.46	0.46	0.21	0.51	0.51	0.09	0.09	0.09	0.12	0.12	0.12
Capacity (c), veh/h	558	2306	731	723	2827	898	170	179	152	211	447	189
Volume-to-Capacity Ratio (X)	0.821	1.044	0.185	0.979	0.933	0.973	0.673	0.816	3.512	0.692	0.583	2.606
Available Capacity (c _a), veh/h	558	2306	731	723	2827	898	170	179	152	211	447	189
Back of Queue (Q), veh/ln (50th percentile)	10.4	42.1	5.6	16.6	11.7	20.6	5.3	7.4	55.0	6.6	5.5	47.2
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	69.2	72.0	44.3	61.3	12.0	14.6	74.5	75.6	77.0	72.0	71.0	75.0
Incremental Delay (d ₂), s/veh	8.9	31.4	0.6	18.5	3.8	15.5	8.2	23.0	1147.0	7.9	1.3	738.0
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	78.1	103.4	44.9	79.8	15.8	30.1	82.7	98.6	1224.0	79.9	72.3	813.0
Level of Service (LOS)	E	F	D	E	B	C	F	F	F	E	E	F
Approach Delay, s/veh / LOS	96.9		F	29.5		C	852.0		F	479.9		F
Intersection Delay, s/veh / LOS	170.8						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.9	C	3.0	C	3.5	D	3.8	D
Bicycle LOS Score / LOS	2.1	B	2.2	B	1.8	A	1.2	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{2_} Rte 3 @ Carl D Silv	Analysis Year	2040 Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	2_2040B_AM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	200	4120	20	30	1550	555	20	10	30	630	10	40

Signal Information				Signal Phases											
Cycle, s	160.0	Reference Phase	2												
Offset, s	0	Reference Point	End	Green	24.5	50.5	9.5	10.0	29.0	0.0					
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.5	4.5	4.5	4.0	4.0	0.0					
Force Mode	Fixed	Simult. Gap N/S	On	Red	3.0	3.0	3.0	3.0	3.0	0.0					

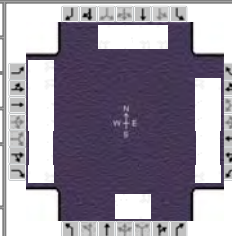
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	1.3	3.0		11.0		9.0
Phase Duration, s	32.0	90.0	17.0	75.0		17.0		36.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.1		2.8
Queue Clearance Time (g _s), s	10.8		2.0			5.0		31.2
Green Extension Time (g _e), s	0.3	0.0	3.6	0.0		0.0		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.00		0.48			0.05		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	208	4292	20	31	1615	578		31	29	656	10	35
Adjusted Saturation Flow Rate (s), veh/h/ln	1757	1708	1533	1774	1659	1579		1839	1464	1774	1900	1610
Queue Service Time (g _s), s	8.8	85.0	1.3	0.0	28.9	52.0		2.6	3.0	29.2	0.7	2.9
Cycle Queue Clearance Time (g _c), s	8.8	85.0	1.3	0.0	28.9	52.0		2.6	3.0	29.2	0.7	2.9
Green Ratio (g/C)	0.16	0.53	0.53	0.38	0.44	0.44		0.08	0.08	0.20	0.20	0.20
Capacity (c), veh/h	571	3630	815	178	2903	691		138	110	699	374	317
Volume-to-Capacity Ratio (X)	0.365	1.182	0.024	0.176	0.556	0.837		0.227	0.266	0.939	0.028	0.112
Available Capacity (c _a), veh/h	571	3630	815	178	2903	691		115	110	699	374	317
Back of Queue (Q), veh/ln (50th percentile)	4.1	49.8	0.5	1.2	11.9	22.4		1.2	1.2	15.2	0.3	1.2
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	63.7	23.3	24.7	68.5	34.3	39.9		71.2	69.8	63.3	51.9	52.8
Incremental Delay (d ₂), s/veh	0.1	85.2	0.1	0.2	0.8	11.6		0.3	0.5	20.3	0.0	0.1
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	63.8	108.5	24.7	68.6	35.0	51.5		71.5	70.3	83.7	51.9	52.8
Level of Service (LOS)	E	F	C	E	D	D		E	E	F	D	D
Approach Delay, s/veh / LOS	106.1		F	39.8		D	70.9		E	81.6		F
Intersection Delay, s/veh / LOS	83.9						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	3.0	C	3.8	D	3.9	D
Bicycle LOS Score / LOS	2.4	B	1.4	A	0.6	A	1.6	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{2_pm} Rte 3 @ Carl D Silv	Analysis Year	2040 Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	2_2040B_PM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	380	2590	20	50	3920	1450	30	10	40	1240	20	280

Signal Information				Signal Timing (s)													
Cycle, s	170.0	Reference Phase	2	Green	34.5	43.5	9.5	10.0	36.0	0.0	Green	34.5	43.5	9.5	10.0	36.0	0.0
Offset, s	0	Reference Point	End	Yellow	4.5	4.5	4.5	4.0	4.0	0.0	Yellow	4.5	4.5	4.5	4.0	4.0	0.0
Uncoordinated	No	Simult. Gap E/W	On	Red	3.0	3.0	3.0	3.0	3.0	0.0	Red	3.0	3.0	3.0	3.0	3.0	0.0
Force Mode	Fixed	Simult. Gap N/S	On														

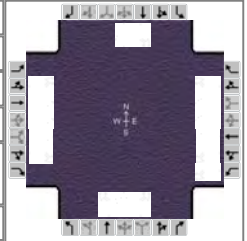
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	1.3	3.0		11.0		9.0
Phase Duration, s	42.0	93.0	17.0	68.0		17.0		43.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.1		2.8
Queue Clearance Time (g _s), s	19.8		2.0			6.0		40.5
Green Extension Time (g _e), s	0.7	0.0	7.3	0.0		0.0		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.00		0.98			0.26		1.00

Movement Group Results	EB			WB			NB			SB			
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R	
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14	
Adjusted Flow Rate (v), veh/h	396	2698	20	52	4083	1510		42	39	1292	21	260	
Adjusted Saturation Flow Rate (s), veh/h/ln	1757	1691	1610	1723	1708	1610		1761	1579	1810	1900	1610	
Queue Service Time (g _s), s	17.8	27.7	0.3	0.0	63.0	63.0		3.9	4.0	38.5	1.5	25.4	
Cycle Queue Clearance Time (g _c), s	17.8	27.7	0.3	0.0	63.0	63.0		3.9	4.0	38.5	1.5	25.4	
Green Ratio (g/C)	0.21	0.52	0.52	0.31	0.37	0.37		0.07	0.07	0.23	0.23	0.23	
Capacity (c), veh/h	744	3502	833	189	2532	597		124	111	820	430	365	
Volume-to-Capacity Ratio (X)	0.532	0.770	0.024	0.275	1.613	2.531		0.335	0.346	1.576	0.048	0.714	
Available Capacity (c _a), veh/h	744	3502	833	189	2532	597		104	111	820	430	365	
Back of Queue (Q), veh/ln (50th percentile)	8.3	4.7	0.1	2.2	75.8	140.5		1.8	1.6	48.0	0.7	11.0	
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	
Uniform Delay (d ₁), s/veh	65.2	7.8	5.6	63.3	53.5	53.5		76.9	75.3	65.8	51.4	60.7	
Incremental Delay (d ₂), s/veh	0.4	1.7	0.1	0.3	277.6	694.0		0.6	0.7	265.1	0.0	5.6	
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	65.6	9.5	5.7	63.6	331.1	747.5		77.5	75.9	330.8	51.4	66.3	
Level of Service (LOS)	E	A	A	E	F	F		E	E	F	D	E	
Approach Delay, s/veh / LOS	16.6		B	440.0		F		76.7		E	283.3		F
Intersection Delay, s/veh / LOS	286.9						F						

Multimodal Results	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	2.3		B	3.0		C	3.8		D	3.9		D
Bicycle LOS Score / LOS	1.8		A	2.8		C	0.6		A	3.1		C

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{3_} Rte 3 @ Gateway E	Analysis Year	2040 Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	3_2040B_AM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	40	1930	430	140	2160	10	310	10	140	10	5	30

Signal Information														
Cycle, s	114.0	Reference Phase	2											
Offset, s	0	Reference Point	End											
Uncoordinated	No	Simult. Gap E/W	On	Green	10.0	31.5	10.0	19.5	7.5	0.0				
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	3.5	4.0	4.5	4.5	0.0				
				Red	3.0	3.0	3.0	3.0	3.0	0.0				

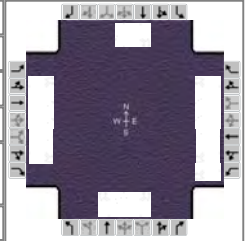
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	3.0		9.0		10.0
Phase Duration, s	17.0	55.0	17.0	55.0		27.0		15.0
Change Period, (Y+R _c), s	7.0	6.5	7.0	7.0		7.5		7.5
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		2.9		3.3
Queue Clearance Time (g _s), s	4.4		6.5			22.4		4.4
Green Extension Time (g _e), s	0.0	0.0	2.4	0.0		0.0		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.00		0.91			1.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	42	2010	414	146	2250	9	323	10	134	10	36	
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1675	1533	1706	1597	1610	1792	1900	1533	1691	1646	
Queue Service Time (g _s), s	2.4	41.3	22.9	4.5	51.5	0.1	20.4	0.5	8.9	0.7	2.4	
Cycle Queue Clearance Time (g _c), s	2.4	41.3	22.9	4.5	51.5	0.1	20.4	0.5	8.9	0.7	2.4	
Green Ratio (g/C)	0.10	0.46	0.46	0.10	0.45	0.45	0.18	0.18	0.18	0.08	0.08	
Capacity (c), veh/h	183	2292	699	344	2165	727	330	350	282	134	108	
Volume-to-Capacity Ratio (X)	0.228	0.877	0.591	0.424	1.039	0.013	0.978	0.030	0.476	0.078	0.337	
Available Capacity (c _a), veh/h	183	2292	699	344	2165	727	330	350	282	134	108	
Back of Queue (Q), veh/ln (50th percentile)	1.1	17.1	8.8	1.9	8.1	0.0	13.0	0.2	3.4	0.3	1.0	
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Uniform Delay (d ₁), s/veh	47.2	29.6	23.1	46.3	5.5	3.0	46.3	38.1	41.6	48.7	50.1	
Incremental Delay (d ₂), s/veh	0.2	5.1	3.6	0.3	30.5	0.0	43.4	0.0	0.5	0.1	0.7	
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	47.4	34.8	26.7	46.6	36.0	3.1	89.7	38.2	42.0	48.7	50.7	
Level of Service (LOS)	D	C	C	D	F	A	F	D	D	D	D	
Approach Delay, s/veh / LOS	33.6	C		36.5	D		74.9	E		50.3	D	
Intersection Delay, s/veh / LOS	38.6						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.9	C	2.3	B	3.5	D	3.4	C
Bicycle LOS Score / LOS	1.8	A	1.8	A	1.3	A	0.6	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{3_pm} Rte 3 @ Gateway E	Analysis Year	2040 Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	3_2040B_PM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	40	2270	600	290	2030	0	400	5	280	10	5	5

Signal Information				Signal Timing (s)										
Cycle, s	114.0	Reference Phase	2	Green	10.0	31.5	10.0	19.5	7.5	0.0	1	2	3	4
Offset, s	0	Reference Point	End	Yellow	4.0	3.5	4.0	4.5	4.5	0.0	5	6	7	8
Uncoordinated	No	Simult. Gap E/W	On	Red	3.0	3.0	3.0	3.0	3.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On											

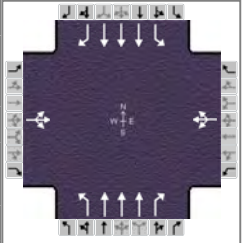
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	3.0		9.0		10.0
Phase Duration, s	17.0	55.0	17.0	55.0		27.0		15.0
Change Period, (Y+R _c), s	7.0	6.5	7.0	7.0		7.5		7.5
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		2.9		3.0
Queue Clearance Time (g _s), s	4.4		11.9			23.0		2.7
Green Extension Time (g _e), s	0.0	0.0	0.0	0.0		0.0		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.00		1.00			1.00		0.02

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	42	2365	591	302	2115	0	417	5	280	10	10	
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1675	1533	1706	1597	1610	1792	1900	1533	1691	1743	
Queue Service Time (g _s), s	2.4	52.0	38.8	9.9	41.3	0.0	21.0	0.3	20.8	0.7	0.6	
Cycle Queue Clearance Time (g _c), s	2.4	52.0	38.8	9.9	41.3	0.0	21.0	0.3	20.8	0.7	0.6	
Green Ratio (g/C)	0.10	0.46	0.46	0.10	0.45	0.45	0.18	0.18	0.18	0.08	0.08	
Capacity (c), veh/h	183	2292	699	344	2165	727	330	350	282	134	115	
Volume-to-Capacity Ratio (X)	0.228	1.032	0.844	0.878	0.977	0.000	1.263	0.015	0.992	0.078	0.091	
Available Capacity (c _a), veh/h	183	2292	699	344	2165	727	330	350	282	134	115	
Back of Queue (Q), veh/ln (50th percentile)	1.1	26.0	16.1	5.1	4.9	0.0	22.1	0.1	11.9	0.3	0.3	
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Uniform Delay (d ₁), s/veh	47.2	31.0	27.4	48.6	5.5	0.0	46.5	38.0	46.4	48.7	49.0	
Incremental Delay (d ₂), s/veh	0.2	27.5	11.9	21.0	14.6	0.0	140.2	0.0	51.2	0.1	0.1	
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	47.4	58.5	39.3	69.7	20.1	0.0	186.7	38.0	97.6	48.7	49.1	
Level of Service (LOS)	D	F	D	E	C		F	D	F	D	D	
Approach Delay, s/veh / LOS	54.6		D	26.3		C	150.0		F	48.9		D
Intersection Delay, s/veh / LOS	54.3						D					

Multimodal Results	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	2.9		C	2.3		B	3.5		D	3.4		C
Bicycle LOS Score / LOS	2.1		B	1.8		A	1.6		A	0.5		A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{4_am} Rte 17 @ McLane I	Analysis Year	2040 Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	4_2040B_AM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	30	10	10	50	5	20	30	3670	60	40	2960	40

Signal Information													
Cycle, s	130.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On	Green	10.5	60.5	38.5	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.5	4.5	3.5	0.0	0.0	0.0			
				Red	3.0	3.0	3.0	0.0	0.0	0.0			

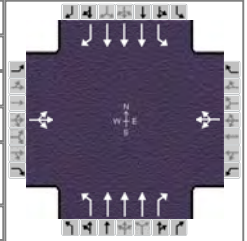
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		8.0		8.0	2.0	3.0	2.0	3.0
Phase Duration, s		45.0		45.0	17.0	68.0	17.0	68.0
Change Period, (Y+R _c), s		6.5		6.5	6.5	7.5	6.5	7.5
Max Allow Headway (MAH), s		3.2		3.2	2.8	0.0	2.8	0.0
Queue Clearance Time (g _s), s		4.9		6.5	4.2		4.9	
Green Extension Time (g _e), s		0.2		0.2	0.0	0.0	0.0	0.0
Phase Call Probability		1.00		1.00	1.00		1.00	
Max Out Probability		0.00		0.00	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	52			78			31	3823	59	42	3083	40
Adjusted Saturation Flow Rate (s), veh/h/ln	1487			1458			1740	1659	1548	1740	1659	1548
Queue Service Time (g _s), s	0.0			1.6			2.2	63.0	0.2	2.9	63.0	1.8
Cycle Queue Clearance Time (g _c), s	2.9			4.5			2.2	63.0	0.2	2.9	63.0	1.8
Green Ratio (g/C)	0.32			0.32			0.09	0.48	0.48	0.10	0.48	0.48
Capacity (c), veh/h	485			478			161	2412	750	174	2412	750
Volume-to-Capacity Ratio (X)	0.107			0.163			0.195	1.585	0.079	0.239	1.278	0.053
Available Capacity (c _a), veh/h	485			478			161	2412	750	174	2412	750
Back of Queue (Q), veh/ln (50th percentile)	1.2			1.8			1.0	68.1	0.1	1.3	53.2	0.7
Queue Storage Ratio (RQ) (50th percentile)	0.00			0.00			0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	33.0			33.6			54.5	12.5	1.0	53.9	33.5	17.7
Incremental Delay (d ₂), s/veh	0.0			0.1			0.2	265.3	0.2	0.3	128.7	0.1
Initial Queue Delay (d ₃), s/veh	0.0			0.0			0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	33.1			33.7			54.8	277.8	1.2	54.2	162.2	17.9
Level of Service (LOS)	C			C			D	F	A	D	F	B
Approach Delay, s/veh / LOS	33.1	C		33.7	C		271.8	F		158.9	F	
Intersection Delay, s/veh / LOS	218.0						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.4	C	3.4	C	2.1	B	2.1	B
Bicycle LOS Score / LOS	0.6	A	0.6	A	2.6	B	2.2	B

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{4_pm} Rte 17 @ McLane I	Analysis Year	2040 Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	4_2040B_PM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	20	5	10	60	10	30	20	3110	30	20	3890	30

Signal Information													
Cycle, s	160.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On	Green	10.5	90.5	38.5	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.5	4.5	3.5	0.0	0.0	0.0			
				Red	3.0	3.0	3.0	0.0	0.0	0.0			

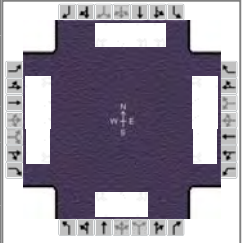
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		8.0		8.0	2.0	3.0	2.0	3.0
Phase Duration, s		45.0		45.0	17.0	98.0	17.0	98.0
Change Period, (Y+R _c), s		6.5		6.5	6.5	7.5	6.5	7.5
Max Allow Headway (MAH), s		3.2		3.2	2.8	0.0	2.8	0.0
Queue Clearance Time (g _s), s		4.9		10.7	3.8		3.8	
Green Extension Time (g _e), s		0.3		0.3	0.0	0.0	0.0	0.0
Phase Call Probability		1.00		1.00	1.00		1.00	
Max Out Probability		0.00		0.00	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	36			104			21	3240	28	21	4052	29
Adjusted Saturation Flow Rate (s), veh/h/ln	1442			1478			1740	1659	1548	1740	1659	1548
Queue Service Time (g _s), s	0.0			5.7			1.8	93.0	0.0	1.8	93.0	1.3
Cycle Queue Clearance Time (g _c), s	2.9			8.7			1.8	93.0	0.0	1.8	93.0	1.3
Green Ratio (g/C)	0.26			0.26			0.08	0.58	0.58	0.08	0.58	0.58
Capacity (c), veh/h	382			392			130	2893	900	141	2893	900
Volume-to-Capacity Ratio (X)	0.095			0.266			0.160	1.120	0.031	0.147	1.401	0.032
Available Capacity (c _a), veh/h	382			392			130	2893	900	141	2893	900
Back of Queue (Q), veh/ln (50th percentile)	1.2			3.4			0.8	17.1	0.0	0.8	85.1	0.5
Queue Storage Ratio (RQ) (50th percentile)	0.00			0.00			0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	47.0			49.2			69.3	2.5	0.0	68.3	33.5	14.3
Incremental Delay (d ₂), s/veh	0.0			0.1			0.2	59.3	0.1	0.2	182.5	0.1
Initial Queue Delay (d ₃), s/veh	0.0			0.0			0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	47.1			49.3			69.5	61.8	0.1	68.5	216.0	14.4
Level of Service (LOS)	D			D			E	F	A	E	F	B
Approach Delay, s/veh / LOS	47.1	D		49.3	D		61.3	E		213.8	F	
Intersection Delay, s/veh / LOS	144.1						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.4	C	3.4	C	2.1	B	2.1	B
Bicycle LOS Score / LOS	0.5	A	0.7	A	2.3	B	2.7	B

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{5_am} Rte 17 @ Sanford I	Analysis Year	2040 Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	5_2040B_AM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	20	2950	30	310	3620	340	90	10	230	230	100	30

Signal Information													
Cycle, s	130.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On	Green	9.5	39.5	23.5	11.0	10.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.5	4.5	4.5	4.0	4.0	0.0			
				Red	3.0	3.0	3.0	3.0	3.0	0.0			

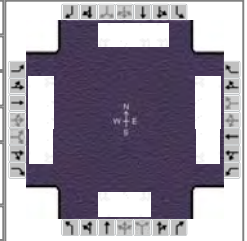
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	3.0		9.0		9.0
Phase Duration, s	31.0	78.0	17.0	64.0		18.0		17.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.0		2.9
Queue Clearance Time (g _s), s	3.3		13.5			15.0		11.0
Green Extension Time (g _e), s	11.2	0.0	0.0	0.0		0.0		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.34		1.00			1.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	21	3073	29	323	3771	339	94	10	215	240	104	29
Adjusted Saturation Flow Rate (s), veh/h/ln	1740	1659	1548	1740	1659	1548	1740	1827	1548	1689	1827	1548
Queue Service Time (g _s), s	1.3	70.5	1.1	11.5	56.5	20.0	6.8	0.7	13.0	9.0	7.1	2.3
Cycle Queue Clearance Time (g _c), s	1.3	70.5	1.1	11.5	56.5	20.0	6.8	0.7	13.0	9.0	7.1	2.3
Green Ratio (g/C)	0.18	0.54	0.54	0.09	0.43	0.43	0.10	0.10	0.10	0.10	0.10	0.10
Capacity (c), veh/h	315	2699	840	154	2163	697	147	183	155	312	176	119
Volume-to-Capacity Ratio (X)	0.066	1.139	0.035	2.098	1.743	0.486	0.637	0.057	1.386	0.768	0.593	0.245
Available Capacity (c _a), veh/h	315	2699	840	154	2163	697	147	183	155	312	176	119
Back of Queue (Q), veh/ln (50th percentile)	0.6	43.6	0.4	27.1	89.7	7.8	3.8	0.3	14.1	4.6	4.0	1.1
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	44.2	29.8	13.9	59.3	36.8	25.2	57.6	53.9	58.5	57.6	56.5	56.4
Incremental Delay (d ₂), s/veh	0.4	67.4	0.1	515.5	336.5	2.4	19.2	0.6	208.5	16.5	13.9	4.8
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	44.6	97.2	14.0	574.8	373.2	27.6	76.8	54.4	267.0	74.1	70.4	61.3
Level of Service (LOS)	D	F	B	F	F	C	E	D	F	E	E	E
Approach Delay, s/veh / LOS	96.1		F	361.5		F	204.1		F	72.1		E
Intersection Delay, s/veh / LOS	241.8						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.4	B	2.6	B	3.4	C	3.4	C
Bicycle LOS Score / LOS	2.2	B	2.9	C	1.0	A	1.1	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{5_pm} Rte 17 @ Sanford I	Analysis Year	2040 Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	5_2040B_PM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	10	3660	70	370	2960	300	50	10	950	510	30	10

Signal Information													
Cycle, s	160.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On	Green	22.5	50.5	17.5	11.0	22.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.5	4.5	4.5	4.0	4.0	0.0			
				Red	3.0	3.0	3.0	3.0	3.0	0.0			

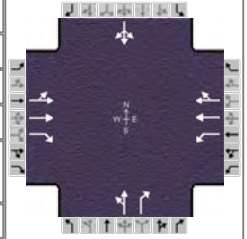
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	2.0	3.0	2.0	3.0		9.0		9.0
Phase Duration, s	25.0	83.0	30.0	88.0		18.0		29.0
Change Period, (Y+R _c), s	7.5	7.5	7.5	7.5		7.0		7.0
Max Allow Headway (MAH), s	2.8	0.0	2.8	0.0		3.0		2.8
Queue Clearance Time (g _s), s	2.9		26.5			15.0		26.0
Green Extension Time (g _e), s	12.0	0.0	0.0	0.0		0.0		0.0
Phase Call Probability	1.00		1.00			1.00		1.00
Max Out Probability	0.75		1.00			1.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	10	3813	69	385	3083	304	52	10	903	531	31	9
Adjusted Saturation Flow Rate (s), veh/h/ln	1740	1659	1548	1740	1659	1548	1740	1827	1548	1689	1827	1548
Queue Service Time (g _s), s	0.9	75.5	3.9	24.5	80.5	18.9	4.6	0.8	13.0	24.0	2.4	0.8
Cycle Queue Clearance Time (g _c), s	0.9	75.5	3.9	24.5	80.5	18.9	4.6	0.8	13.0	24.0	2.4	0.8
Green Ratio (g/C)	0.11	0.47	0.47	0.15	0.50	0.50	0.08	0.08	0.08	0.15	0.15	0.15
Capacity (c), veh/h	190	2348	731	266	2504	798	120	148	126	507	280	213
Volume-to-Capacity Ratio (X)	0.055	1.624	0.094	1.447	1.231	0.381	0.435	0.070	7.179	1.048	0.112	0.044
Available Capacity (c _a), veh/h	190	2348	731	266	2504	798	120	148	126	507	280	213
Back of Queue (Q), veh/ln (50th percentile)	0.4	91.9	1.5	27.3	57.2	7.4	2.4	0.4	102.9	14.1	1.2	0.4
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	63.8	42.3	23.4	67.8	39.8	23.4	71.5	68.8	73.5	68.0	58.6	59.9
Incremental Delay (d ₂), s/veh	0.5	282.6	0.3	220.9	107.8	1.4	11.1	0.9	2797.2	53.2	0.8	0.4
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	64.4	324.8	23.6	288.6	147.6	24.7	82.6	69.7	2870.7	121.2	59.4	60.3
Level of Service (LOS)	E	F	C	F	F	C	F	E	F	F	E	E
Approach Delay, s/veh / LOS	318.8		F	152.1		F	2690.1		F	116.8		F
Intersection Delay, s/veh / LOS	486.7						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.6	B	2.6	B	3.4	C	3.4	C
Bicycle LOS Score / LOS	2.6	B	2.6	B	2.1	B	1.4	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.96
Intersection	{6_am} Rte 17 @ Short St	Analysis Year	2040 Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	6_2040B_AM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	10	1400	70	20	1350	5	130	0	20	5	0	20

Signal Information														
Cycle, s	100.0	Reference Phase	2											
Offset, s	0	Reference Point	End											
Uncoordinated	No	Simult. Gap E/W	On	Green	10.0	32.5	19.0	10.0	0.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.5	4.0	4.0	0.0	0.0				
				Red	3.0	3.0	3.0	3.0	0.0	0.0				

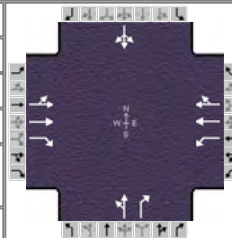
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6		8		4
Case Number		7.3	1.0	4.0		11.0		12.0
Phase Duration, s		40.0	17.0	57.0		26.0		17.0
Change Period, (Y+R _c), s		7.5	7.0	7.5		7.0		7.0
Max Allow Headway (MAH), s		0.0	2.8	0.0		3.1		3.3
Queue Clearance Time (g _s), s			2.6			8.6		3.4
Green Extension Time (g _e), s		0.0	0.0	0.0		0.2		0.0
Phase Call Probability			1.00			1.00		1.00
Max Out Probability			0.00			0.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	765	704	68	21	706	705		135	20		26	
Adjusted Saturation Flow Rate (s), veh/h/ln	1811	1679	1579	1810	1863	1860		1810	1563		1646	
Queue Service Time (g _s), s	11.9	35.0	2.9	0.6	29.3	29.3		6.6	1.0		1.4	
Cycle Queue Clearance Time (g _c), s	32.5	35.0	2.9	0.6	29.3	29.3		6.6	1.0		1.4	
Green Ratio (g/C)	0.35	0.35	0.35	0.48	0.52	0.52		0.21	0.21		0.12	
Capacity (c), veh/h	625	588	553	280	969	921		380	328		198	
Volume-to-Capacity Ratio (X)	1.224	1.198	0.123	0.074	0.729	0.766		0.356	0.060		0.132	
Available Capacity (c _a), veh/h	625	588	553	280	969	921		344	328		165	
Back of Queue (Q), veh/ln (50th percentile)	34.7	30.8	1.1	0.2	13.2	13.4		2.9	0.4		0.6	
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		0.00	
Uniform Delay (d ₁), s/veh	33.3	32.5	22.1	20.4	19.4	18.6		35.5	31.6		41.2	
Incremental Delay (d ₂), s/veh	114.5	105.0	0.5	0.0	4.8	6.1		0.2	0.0		0.1	
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Control Delay (d), s/veh	147.8	137.5	22.5	20.5	24.2	24.6		35.7	31.6		41.3	
Level of Service (LOS)	F	F	C	C	C	C		D	C		D	
Approach Delay, s/veh / LOS	137.5	F		24.3	C		35.2	D		41.3	D	
Intersection Delay, s/veh / LOS	80.2						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.1	B	2.9	C	2.9	C
Bicycle LOS Score / LOS	1.8	A	1.7	A	0.7	A	0.5	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Baker			Duration, h	0.25
Analyst	ZPH, CRD update	Analysis Date	Nov 13, 2013	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.96
Intersection	{6_pm} Rte 17 @ Short St	Analysis Year	2040 Build w/ Exist Timings	Analysis Period	1> 7:00
File Name	6_2040B_PM_NotOpt.xus				
Project Description	I-95 Interchange Modification Report				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	10	2370	120	20	1210	5	110	5	40	5	5	10

Signal Information														
Cycle, s	110.0	Reference Phase	2											
Offset, s	0	Reference Point	End											
Uncoordinated	No	Simult. Gap E/W	On	Green	11.0	43.5	16.0	11.0	0.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.5	4.0	4.0	0.0	0.0				
				Red	3.0	3.0	3.0	3.0	0.0	0.0				

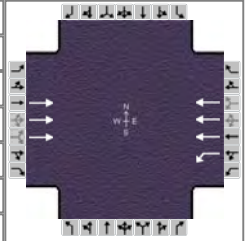
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6		8		4
Case Number		7.3	1.0	4.0		11.0		12.0
Phase Duration, s		51.0	18.0	69.0		23.0		18.0
Change Period, (Y+R _c), s		7.5	7.0	7.5		7.0		7.0
Max Allow Headway (MAH), s		0.0	2.8	0.0		3.1		3.3
Queue Clearance Time (g _s), s			2.6			8.6		3.2
Green Extension Time (g _e), s		0.0	0.0	0.0		0.2		0.0
Phase Call Probability			1.00			1.00		1.00
Max Out Probability			0.00			0.01		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	1298	1181	117	21	633	632		120	39		21	
Adjusted Saturation Flow Rate (s), veh/h/ln	1845	1695	1548	1757	1863	1860		1813	1610		1723	
Queue Service Time (g _s), s	16.0	46.0	5.2	0.6	23.7	23.7		6.6	2.3		1.2	
Cycle Queue Clearance Time (g _c), s	43.5	46.0	5.2	0.6	23.7	23.7		6.6	2.3		1.2	
Green Ratio (g/C)	0.42	0.42	0.42	0.54	0.58	0.58		0.16	0.16		0.12	
Capacity (c), veh/h	763	709	647	265	1084	1040		297	263		204	
Volume-to-Capacity Ratio (X)	1.702	1.666	0.180	0.079	0.584	0.608		0.404	0.146		0.102	
Available Capacity (c _a), veh/h	763	709	647	265	1084	1040		264	263		172	
Back of Queue (Q), veh/ln (50th percentile)	88.0	78.4	2.0	0.2	10.2	10.2		3.0	0.9		0.5	
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		0.00	
Uniform Delay (d ₁), s/veh	32.8	32.0	20.1	21.8	15.2	14.6		43.0	39.4		44.9	
Incremental Delay (d ₂), s/veh	321.6	305.9	0.6	0.0	2.3	2.6		0.3	0.1		0.1	
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Control Delay (d), s/veh	354.4	337.9	20.7	21.8	17.5	17.2		43.3	39.5		44.9	
Level of Service (LOS)	F	F	C	C	B	B		D	D		D	
Approach Delay, s/veh / LOS	331.9		F	17.4		B	42.4		D	44.9		D
Intersection Delay, s/veh / LOS	219.5						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.1	B	2.9	C	2.9	C
Bicycle LOS Score / LOS	2.6	B	1.5	A	0.7	A	0.5	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Michael Baker Jr.			Duration, h	0.25
Analyst	ZPH	Analysis Date	Apr 29, 2014	Area Type	Other
Jurisdiction		Time Period	AM Peak	PHF	0.92
Intersection	7-AM-Ramp F	Analysis Year	2040 Build	Analysis Period	1 > 7:00
File Name	7_2040B_AM_NotOpt.xus				
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h		1890		150	4290							

Signal Information												
Cycle, s	130.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
		Green	13.7	101.3	0.0	0.0	0.0	0.0				
		Yellow	4.5	4.5	0.0	0.0	0.0	0.0				
		Red	3.0	3.0	0.0	0.0	0.0	0.0				

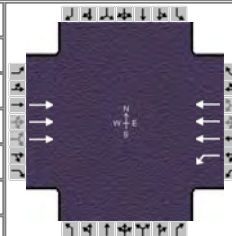
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6				
Case Number		8.3	2.0	4.0				
Phase Duration, s		108.8	21.2	130.0				
Change Period, (Y+R _c), s		7.5	7.5	7.5				
Max Allow Headway (MAH), s		0.0	3.1	0.0				
Queue Clearance Time (g _s), s			13.5					
Green Extension Time (g _e), s		0.0	0.2	0.0				
Phase Call Probability			1.00					
Max Out Probability			0.00					

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2		1	6							
Adjusted Flow Rate (v), veh/h		2054		163	4663							
Adjusted Saturation Flow Rate (s), veh/h/ln		1725		1810	1725							
Queue Service Time (g _s), s		18.9		11.5	68.2							
Cycle Queue Clearance Time (g _c), s		18.9		11.5	68.2							
Green Ratio (g/C)		0.78		0.11	0.94							
Capacity (c), veh/h		4034		190	4877							
Volume-to-Capacity Ratio (X)		0.509		0.857	0.956							
Available Capacity (c _a), veh/h		4034		327	4877							
Back of Queue (Q), veh/ln (50th percentile)		5.7		5.5	2.8							
Queue Storage Ratio (RQ) (50th percentile)		0.00		0.00	0.00							
Uniform Delay (d ₁), s/veh		5.2		57.2	2.2							
Incremental Delay (d ₂), s/veh		0.5		4.3	6.1							
Initial Queue Delay (d ₃), s/veh		0.0		0.0	0.0							
Control Delay (d), s/veh		5.7		61.5	8.3							
Level of Service (LOS)		A		E	A							
Approach Delay, s/veh / LOS	5.7	A		10.1	B		0.0			0.0		
Intersection Delay, s/veh / LOS	8.8						A					

Multimodal Results	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	1.8	A		0.5	A		3.3	C		3.2	C	
Bicycle LOS Score / LOS	1.6	A		3.1	C							

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Michael Baker Jr.			Duration, h	0.25
Analyst	ZPH	Analysis Date	Apr 29, 2014	Area Type	Other
Jurisdiction		Time Period	PM Peak	PHF	0.92
Intersection	7-PM-Ramp F	Analysis Year	2040 Build	Analysis Period	1 > 7:00
File Name	7_2040B_PM_NotOpt.xus				
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h		2220		200	3630							

Signal Information												
Cycle, s	160.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
		Green	21.3	123.7	0.0	0.0	0.0	0.0				
		Yellow	4.5	4.5	0.0	0.0	0.0	0.0				
		Red	3.0	3.0	0.0	0.0	0.0	0.0				

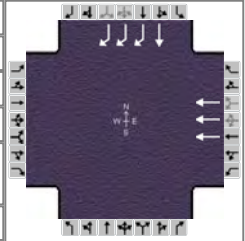
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6				
Case Number		8.3	2.0	4.0				
Phase Duration, s		131.2	28.8	160.0				
Change Period, (Y+R _c), s		7.5	7.5	7.5				
Max Allow Headway (MAH), s		0.0	3.1	0.0				
Queue Clearance Time (g _s), s			20.9					
Green Extension Time (g _e), s		0.0	0.4	0.0				
Phase Call Probability			1.00					
Max Out Probability			0.00					

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2		1	6							
Adjusted Flow Rate (v), veh/h		2413		217	3946							
Adjusted Saturation Flow Rate (s), veh/h/ln		1725		1810	1725							
Queue Service Time (g _s), s		31.7		18.9	24.1							
Cycle Queue Clearance Time (g _c), s		31.7		18.9	24.1							
Green Ratio (g/C)		0.77		0.13	0.95							
Capacity (c), veh/h		4001		241	4933							
Volume-to-Capacity Ratio (X)		0.603		0.902	0.800							
Available Capacity (c _a), veh/h		4001		492	4933							
Back of Queue (Q), veh/ln (50th percentile)		10.8		9.1	0.7							
Queue Storage Ratio (RQ) (50th percentile)		0.00		0.00	0.00							
Uniform Delay (d ₁), s/veh		7.7		68.3	0.7							
Incremental Delay (d ₂), s/veh		0.7		5.0	1.4							
Initial Queue Delay (d ₃), s/veh		0.0		0.0	0.0							
Control Delay (d), s/veh		8.4		73.3	2.2							
Level of Service (LOS)		A		E	A							
Approach Delay, s/veh / LOS	8.4		A	5.9		A	0.0			0.0		
Intersection Delay, s/veh / LOS	6.8						A					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.9	A	0.5	A	3.3	C	3.2	C
Bicycle LOS Score / LOS	1.8	A	2.8	C				

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Michael Baker Jr			Duration, h	0.25
Analyst	ZPH	Analysis Date	Apr 29, 2014	Area Type	Other
Jurisdiction		Time Period	AM Peak	PHF	0.92
Intersection	SB ramp and WB Rt 3 Alt 1	Analysis Year	2040 Build_not Opt	Analysis Period	1> 7:00
File Name	1B_2040B_AM_NotOpt.xus				
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h					1300						0	835

Signal Information												
Cycle, s	160.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
Green	0.0	37.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

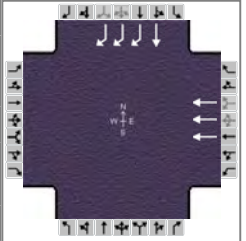
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase				6				4
Case Number				8.0				11.0
Phase Duration, s				117.1				42.9
Change Period, (Y+R _c), s				5.0				5.0
Max Allow Headway (MAH), s				0.0				3.4
Queue Clearance Time (g _s), s								34.9
Green Extension Time (g _e), s				0.0				3.0
Phase Call Probability								1.00
Max Out Probability								0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement					6					4	14	
Adjusted Flow Rate (v), veh/h					1413					0	908	
Adjusted Saturation Flow Rate (s), veh/h/ln					1725					1900	1425	
Queue Service Time (g _s), s					18.0					0.0	32.9	
Cycle Queue Clearance Time (g _c), s					18.0					0.0	32.9	
Green Ratio (g/C)					0.70					0.24	0.24	
Capacity (c), veh/h					3625					450	1014	
Volume-to-Capacity Ratio (X)					0.390					0.000	0.895	
Available Capacity (c _a), veh/h					3625					1663	3741	
Back of Queue (Q), veh/ln (50th percentile)					6.7					0.0	11.9	
Queue Storage Ratio (RQ) (50th percentile)					0.00					0.00	0.00	
Uniform Delay (d ₁), s/veh					9.9					0.0	59.1	
Incremental Delay (d ₂), s/veh					0.3					0.0	1.2	
Initial Queue Delay (d ₃), s/veh					0.0					0.0	0.0	
Control Delay (d), s/veh					10.2					0.0	60.3	
Level of Service (LOS)					B						E	
Approach Delay, s/veh / LOS	0.0			10.2	B	0.0			60.3	E		
Intersection Delay, s/veh / LOS	29.8						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.0	A	2.1	B	2.0	A	2.9	C
Bicycle LOS Score / LOS			1.3	A			2.0	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Michael Baker Jr			Duration, h	0.25
Analyst	ZPH	Analysis Date	Apr 29, 2014	Area Type	Other
Jurisdiction		Time Period	PM Peak	PHF	0.92
Intersection	SB Ramp and WB Rt 3 Alt	Analysis Year	2040 Build_not opt	Analysis Period	1> 7:00
File Name	1B_2040B_PM_NotOpt.xus				
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h					1955						0	3070

Signal Information													
Cycle, s	170.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On										
Force Mode	Fixed	Simult. Gap N/S	On										
		Green	0.0	100.0	0.0	0.0	0.0	0.0	0.0				
		Yellow	0.0	4.5	0.0	0.0	0.0	0.0	0.0				
		Red	0.0	3.0	0.0	0.0	0.0	0.0	0.0				

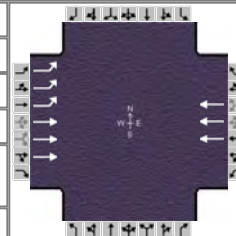
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase				6				4
Case Number				8.0				11.0
Phase Duration, s				62.5				107.5
Change Period, (Y+R _c), s				7.5				7.5
Max Allow Headway (MAH), s				0.0				3.4
Queue Clearance Time (g _s), s								102.0
Green Extension Time (g _e), s				0.0				0.0
Phase Call Probability								1.00
Max Out Probability								1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement					6					4	14	
Adjusted Flow Rate (v), veh/h					2125					0	3337	
Adjusted Saturation Flow Rate (s), veh/h/ln					1691					1900	1357	
Queue Service Time (g _s), s					55.0					0.0	100.0	
Cycle Queue Clearance Time (g _c), s					55.0					0.0	100.0	
Green Ratio (g/C)					0.32					0.59	0.59	
Capacity (c), veh/h					1642					1118	2395	
Volume-to-Capacity Ratio (X)					1.294					0.000	1.393	
Available Capacity (c _a), veh/h					1642					1118	2395	
Back of Queue (Q), veh/ln (50th percentile)					44.2					0.0	71.5	
Queue Storage Ratio (RQ) (50th percentile)					0.00					0.00	0.00	
Uniform Delay (d ₁), s/veh					57.5					0.0	35.0	
Incremental Delay (d ₂), s/veh					137.2					0.0	179.6	
Initial Queue Delay (d ₃), s/veh					0.0					0.0	0.0	
Control Delay (d), s/veh					194.7					0.0	214.6	
Level of Service (LOS)					F						F	
Approach Delay, s/veh / LOS	0.0			194.7	F	0.0			214.6	F		
Intersection Delay, s/veh / LOS	206.9						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.0	A	2.1	B	2.0	A	2.9	C
Bicycle LOS Score / LOS			1.7	A			6.0	F

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Michael Baker Jr.			Duration, h	0.25
Analyst	ZPH	Analysis Date	Apr 29, 2014	Area Type	Other
Jurisdiction		Time Period	AM Peak	PHF	0.92
Intersection	3A-AM	Analysis Year	2040 Build not Opt	Analysis Period	1 > 7:00
File Name	3A_2040B_AM_NotOpt.xus				
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	2990	2060			1090							

Signal Information												
Cycle, s	160.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
		Green	104.5	40.5	0.0	0.0	0.0	0.0				
		Yellow	4.5	4.5	0.0	0.0	0.0	0.0				
		Red	3.0	3.0	0.0	0.0	0.0	0.0				

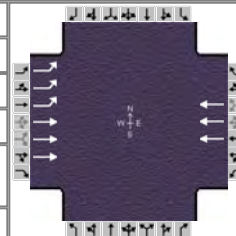
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6				
Case Number	2.0	4.0		8.3				
Phase Duration, s	112.0	160.0		48.0				
Change Period, (Y+R _c), s	7.5	7.5		7.5				
Max Allow Headway (MAH), s	3.1	0.0		0.0				
Queue Clearance Time (g _s), s	104.0							
Green Extension Time (g _e), s	0.5	0.0		0.0				
Phase Call Probability	1.00							
Max Out Probability	1.00							

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6							
Adjusted Flow Rate (v), veh/h	3250	2239			1185							
Adjusted Saturation Flow Rate (s), veh/h/ln	1673	1643			1643							
Queue Service Time (g _s), s	102.0	6.2			37.8							
Cycle Queue Clearance Time (g _c), s	102.0	6.2			37.8							
Green Ratio (g/C)	0.65	0.95			0.25							
Capacity (c), veh/h	3278	4698			1249							
Volume-to-Capacity Ratio (X)	0.992	0.477			0.949							
Available Capacity (c _a), veh/h	3279	4698			1249							
Back of Queue (Q), veh/ln (50th percentile)	42.1	0.2			17.5							
Queue Storage Ratio (RQ) (50th percentile)	2.73	0.00			0.00							
Uniform Delay (d ₁), s/veh	27.3	0.3			58.7							
Incremental Delay (d ₂), s/veh	13.7	0.3			15.8							
Initial Queue Delay (d ₃), s/veh	0.0	0.0			0.0							
Control Delay (d), s/veh	41.1	0.7			74.6							
Level of Service (LOS)	D	A			E							
Approach Delay, s/veh / LOS	24.6	C		74.6	E		0.0			0.0		
Intersection Delay, s/veh / LOS	33.5						C					

Multimodal Results	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	0.5	A		2.9	C		3.2	C		3.5	D	
Bicycle LOS Score / LOS	3.5	D		1.1	A							

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Michael baker Jr.			Duration, h	0.25
Analyst	ZPH	Analysis Date	Apr 29, 2014	Area Type	Other
Jurisdiction		Time Period	PM Peak	PHF	0.92
Intersection	3A-PM	Analysis Year	2040 Build not Opt	Analysis Period	1> 7:00
File Name	3A_2040B_PM_NotOpt.xus				
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	1390	2610			1605							

Signal Information												
Cycle, s	170.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
		Green	56.1	98.9	0.0	0.0	0.0	0.0				
		Yellow	4.5	4.5	0.0	0.0	0.0	0.0				
		Red	3.0	3.0	0.0	0.0	0.0	0.0				

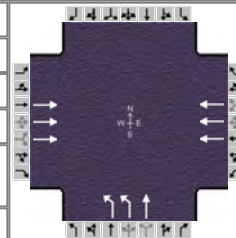
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6				
Case Number	2.0	4.0		8.3				
Phase Duration, s	63.6	170.0		106.4				
Change Period, (Y+R _c), s	7.5	7.5		7.5				
Max Allow Headway (MAH), s	3.1	0.0		0.0				
Queue Clearance Time (g _s), s	51.1							
Green Extension Time (g _e), s	5.0	0.0		0.0				
Phase Call Probability	1.00							
Max Out Probability	0.00							

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6							
Adjusted Flow Rate (v), veh/h	1511	2837			1745							
Adjusted Saturation Flow Rate (s), veh/h/ln	1673	1643			1643							
Queue Service Time (g _s), s	49.1	10.2			38.9							
Cycle Queue Clearance Time (g _c), s	49.1	10.2			38.9							
Green Ratio (g/C)	0.33	0.96			0.58							
Capacity (c), veh/h	1655	4712			2869							
Volume-to-Capacity Ratio (X)	0.913	0.602			0.608							
Available Capacity (c _a), veh/h	4385	4712			2869							
Back of Queue (Q), veh/ln (50th percentile)	20.7	0.3			15.2							
Queue Storage Ratio (RQ) (50th percentile)	1.35	0.00			0.00							
Uniform Delay (d ₁), s/veh	54.6	0.4			23.0							
Incremental Delay (d ₂), s/veh	0.9	0.6			1.0							
Initial Queue Delay (d ₃), s/veh	0.0	0.0			0.0							
Control Delay (d), s/veh	55.5	1.0			24.0							
Level of Service (LOS)	E	A			C							
Approach Delay, s/veh / LOS	19.9	B		24.0	C		0.0			0.0		
Intersection Delay, s/veh / LOS	21.1						C					

Multimodal Results	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	0.5	A		2.8	C		3.2	C		3.5	D	
Bicycle LOS Score / LOS	2.9	C		1.4	A							

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Michael Baker Jr			Duration, h	0.25
Analyst	ZPH	Analysis Date	Apr 29, 2014	Area Type	Other
Jurisdiction		Time Period	AM Peak	PHF	0.92
Intersection	4A-AM	Analysis Year	2040 Build NOt Opt	Analysis Period	1> 7:00
File Name	4A_2040B_AM_NotOpt.xus				
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h		2060			1090		390	0				

Signal Information												
Cycle, s	160.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
		Green	122.3	22.7	0.0	0.0	0.0	0.0				
		Yellow	4.5	4.5	0.0	0.0	0.0	0.0				
		Red	3.0	3.0	0.0	0.0	0.0	0.0				

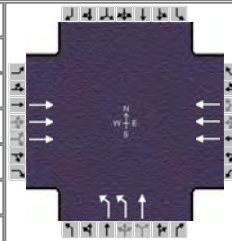
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		8		
Case Number		8.0		8.0		10.0		
Phase Duration, s		129.8		129.8		30.2		
Change Period, (Y+R _c), s		7.5		7.5		7.5		
Max Allow Headway (MAH), s		0.0		0.0		3.1		
Queue Clearance Time (g _s), s						21.7		
Green Extension Time (g _e), s		0.0		0.0		1.0		
Phase Call Probability						1.00		
Max Out Probability						0.00		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2			6		3	8				
Adjusted Flow Rate (v), veh/h		2239			1185		424	0				
Adjusted Saturation Flow Rate (s), veh/h/ln		1643			1643		1689	1827				
Queue Service Time (g _s), s		31.4			11.9		19.7	0.0				
Cycle Queue Clearance Time (g _c), s		31.4			11.9		19.7	0.0				
Green Ratio (g/C)		0.76			0.76		0.14	0.14				
Capacity (c), veh/h		3768			3768		479	259				
Volume-to-Capacity Ratio (X)		0.594			0.314		0.885	0.000				
Available Capacity (c _a), veh/h		3768			3768		919	497				
Back of Queue (Q), veh/ln (50th percentile)		10.3			3.9		8.6	0.0				
Queue Storage Ratio (RQ) (50th percentile)		0.00			0.00		0.00	0.00				
Uniform Delay (d ₁), s/veh		8.1			5.8		67.4	0.0				
Incremental Delay (d ₂), s/veh		0.7			0.2		2.2	0.0				
Initial Queue Delay (d ₃), s/veh		0.0			0.0		0.0	0.0				
Control Delay (d), s/veh		8.8			6.1		69.6	0.0				
Level of Service (LOS)		A			A		E					
Approach Delay, s/veh / LOS	8.8	A		6.1	A		69.6	E		0.0		
Intersection Delay, s/veh / LOS	14.7						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.9	A	1.9	A	3.2	C	3.2	C
Bicycle LOS Score / LOS	1.7	A	1.1	A	1.2	A		

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Michael Baker Jr, Inc			Duration, h	0.25
Analyst	ZPH	Analysis Date	Apr 29, 2014	Area Type	Other
Jurisdiction		Time Period	PM Peak	PHF	0.92
Intersection	4A-PM	Analysis Year	2040 Build	Analysis Period	1 > 7:00
File Name	4A_2040B_PM_NotOpt.xus				
Project Description					



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h		2610			1605		690	0				

Signal Information											
Cycle, s	170.0	Reference Phase	2	→ ←							1 → 2 ↘ 3 4
Offset, s	0	Reference Point	End	↔ ↑							← ↙ 6 7 ↗ 8
Uncoordinated	No	Simult. Gap E/W	On	Green	114.2	40.8	0.0	0.0	0.0	0.0	
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.5	4.5	0.0	0.0	0.0	0.0	
				Red	3.0	3.0	0.0	0.0	0.0	0.0	

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		8		
Case Number		8.0		8.0		10.0		
Phase Duration, s		121.7		121.7		48.3		
Change Period, (Y+R _c), s		7.5		7.5		7.5		
Max Allow Headway (MAH), s		0.0		0.0		3.1		
Queue Clearance Time (g _s), s						38.9		
Green Extension Time (g _e), s		0.0		0.0		2.0		
Phase Call Probability						1.00		
Max Out Probability						0.00		

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2			6		3	8				
Adjusted Flow Rate (v), veh/h		2837			1745		750	0				
Adjusted Saturation Flow Rate (s), veh/h/ln		1643			1643		1689	1827				
Queue Service Time (g _s), s		75.7			30.6		36.9	0.0				
Cycle Queue Clearance Time (g _c), s		75.7			30.6		36.9	0.0				
Green Ratio (g/C)		0.67			0.67		0.24	0.24				
Capacity (c), veh/h		3311			3311		811	439				
Volume-to-Capacity Ratio (X)		0.857			0.527		0.924	0.000				
Available Capacity (c _a), veh/h		3311			3311		1640	887				
Back of Queue (Q), veh/ln (50th percentile)		28.6			11.3		16.0	0.0				
Queue Storage Ratio (RQ) (50th percentile)		0.00			0.00		0.00	0.00				
Uniform Delay (d ₁), s/veh		21.6			14.2		63.1	0.0				
Incremental Delay (d ₂), s/veh		3.1			0.6		2.0	0.0				
Initial Queue Delay (d ₃), s/veh		0.0			0.0		0.0	0.0				
Control Delay (d), s/veh		24.7			14.8		65.1	0.0				
Level of Service (LOS)		C			B		E					
Approach Delay, s/veh / LOS	24.7	C		14.8	B		65.1	E		0.0		
Intersection Delay, s/veh / LOS	27.1						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.9	A	1.9	A	3.2	C	3.2	C
Bicycle LOS Score / LOS	2.0	B	1.4	A	1.7	A		



APPENDIX D
MSAT INFORMATION / SAMPLE INPUTS

MOVESRu nID	iteration D	yearID	monthID	dayID	hourID	stateID	countyID	zoneID	pollutant D	process ID	source TypeID	fuel TypeID	model YearID	road TypeID	emissionQua nt
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MOVES RunID	iteration ID	year ID	month ID	day ID	hourID	stateID	countyID	pollutant ID	fuelType ID	roadType ID	emission	Quant
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MOVES RunID	iteration ID	year ID	month ID	day ID	hour ID	state ID	county ID	pollutant ID	fuel Type ID	model Year ID	road Type ID	emission Quant
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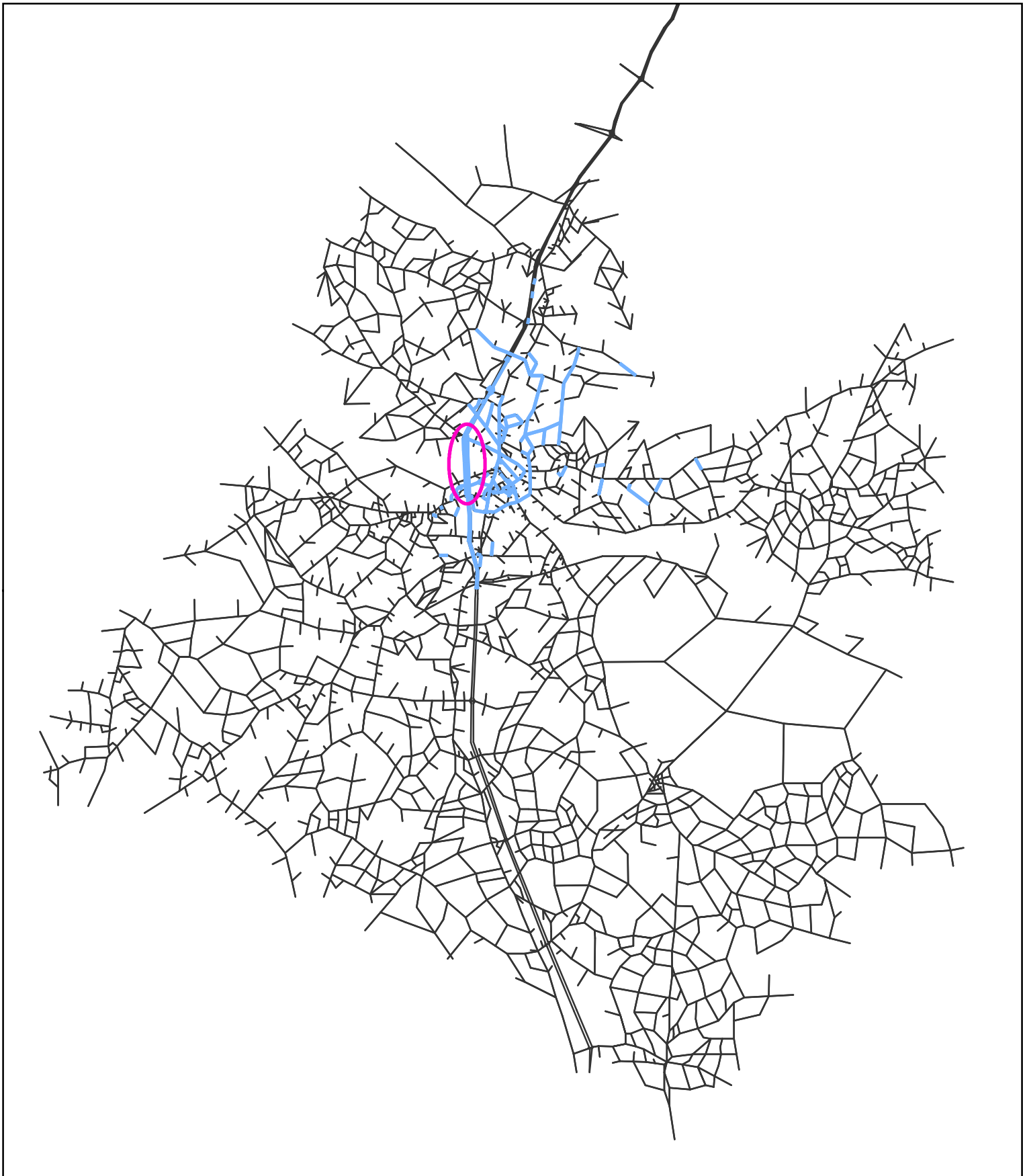





Figure D-1
 MSAT Affected Network
 I-95 Rappahannock River Crossing
 VDOT Project 0095-111-259, P101, UPC 101595
 Stafford and Spotsylvania Counties and the City of Fredericksburg, Virginia
 (Source: FAMPO)

-  Study Area
-  Full FAMPO Network
-  MSAT Affected Network

**Network and map not to scale*



APPENDIX E
LIST OF ASSUMPTIONS

Assumptions Used For Air Quality Analysis

1. For the CAL3QHC models' meteorology condition within the study area, Wind Stability Class D was used to represent a neutral stability as well as low wind speeds. Class D conditions are typically associated with urban settings and were applied to the CO hot-spot analysis. Wind direction was modeled from all directions using a 10-degree increment angle (0-360 degrees).
2. The site characteristic (surface roughness) for the project was modeled as an "urban" land environment using a 175 cm coefficient, which typically is a measure of the height of obstacles to the wind flow.
3. For all queue link parameters, the "average" driver behavior was selected for existing and build scenarios.
4. Based on the Consultant Guide, a background CO concentration of 2.9 ppm was assumed and added to the CO concentrations predicted by the computer modeling effort for existing and build conditions. The project study area is located in northern Virginia and reports a background concentration of 2.9 ppm. Additionally, 0.7 persistence factor was used to project 8-hour CO concentrations, with an assumed background concentration of 2.3 ppm, as stipulated in VDOT and EPA guidance.
5. In support of the MOVES model, data was obtained from the Virginia Department of Environmental Quality (VDEQ) and from VDOT Air Quality Staff. The data provided includes fuel information, age distributions by vehicle class, vehicle population by vehicle class, as well as other general support data.
6. For the MOVES models, the peak hour traffic volumes and the posted speed for that hour were used. In addition, the urban restricted and unrestricted road types were selected for appropriate roads. Source type hour fractions for each roadway link are based on a combination of count data and the vehicle populations data set provided by VDOT.
7. Roadway grades used in the MOVES modeling were based on a combination of resources including: profiles developed in conjunction with the proposed improvements, USGS elevation data from GIS files, and/or USGS contour mapping as needed.
8. If the projected CO concentrations are below the National Ambient Air Quality Standards (NAAQS) for CO, than it is assumed that all other parts of the corridor will also remain below the thresholds.
9. The approach to conduct the MSAT quantitative analysis consisted of the following procedures:

- a. Based on traffic projections for the analysis years, identify the segments directly associated with the project and those roadways in the affected network where the Annual Average Daily Traffic (AADT) is expected to change +/- 5% for the Build alternative compared to the No-Build alternative. The affected network can be referenced in the appendix of the air study.
- b. Use of the following information:
 - i. AADT's, peak hour volumes and diurnal traffic distribution for I-95 and other roadways in the affected network.
 - ii. Estimate speeds for congested periods and for free-flow conditions.
- c. Speeds distribution will be based on the congested speed provided in Travel Demand Model. The time periods provided are Off-peak, AM-peak and PM-peak. Both peak periods cover a three hour period, while the off-peak covers the remaining 18 hours. The speeds provided will be applied to each hour in the time period to determine the hourly speed distribution.
- d. Road type distribution will be based on the functional class of the roadways and the area designation from the Travel Demand Model. Interstates were assigned to MOVES road type category 4, while the majority of the other roads were assigned to MOVES road type category 5.
- e. Run MOVES2010b interface with revised local parameters (if necessary) for the four quarters of each analysis year.
- f. Compute annual MSAT emissions and compare existing, interim, and design year for the no-build and build conditions.
- g. Consider mitigation if meaningful increases in MSAT emissions are identified.
- h. As described above, the report will include extensive discussions of the uncertainties and limitations when performing a quantitative MSAT analysis.



APPENDIX F
REFERENCES

Reference Materials Used For Air Quality Analysis

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APPENDIX G
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