

Pennsylvania Department of Transportation

INTERSTATE 80 RECONSTRUCTION PROJECT

FINAL AIR QUALITY TECHNICAL REPORT

Submitted to:



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February 2016

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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. 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 National Ambient Air Quality Standards (NAAQS) 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 Pennsylvania Department of Transportation (PennDOT) 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).

Previously, Monroe County was designated as "maintenance" in regards to the eight-hour ozone standard and was subject to regional transportation conformity requirements. However, as of July 20, 2013, Monroe County has been designated as "attainment" for the eight-hour ozone standard; therefore, the project is not subject to regional or project level transportation conformity requirements.

The purpose of the project is to provide a safe and efficient transportation route on this National Highway System component for both local and regional connections by reducing future congestion on I-80 in the 2045 design year to level-of-service E or better, improving safety, and bringing the I-80 roadway and bridge structures up to current design standards.

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 Pennsylvania Department of Transportation (PennDOT), in cooperation with the Federal Highway Administration (FHWA), is studying potential environmental impacts as a result of adding two additional general purpose lanes in each direction as part of the I-80 Reconstruction Project. The project involves the addition of travel lanes to mainline Interstate 80, as well as interchange improvements at Route 209 (Exit 304), West Main Street (Business Route 209/Exit 305), Park Avenue (Route 611/Exit 306), and Broad Street (Route 911/Exit 307). These improvements are being proposed to provide greater operational efficiency for existing and Design Year traffic volumes.

Figure 1 shows the regional location of the project. The study area consists of lands surrounding the proposed project elements on which there are human activities that could potentially be affected by the project.

Alternatives Considered

Five preliminary build alternatives were assessed in the Phase I Alternatives Analysis Report. Three alternatives have been carried forward for Phase II analysis: Alternatives 2-A, 2-B, and 2-D. A brief discussion of each of the alternatives considered for the analysis can be referenced below.

Alternative 2-A

Mainline I-80 will generally follow the existing alignment and the proposed typical section consists of three 12 foot lanes each direction with a 26-foot median (including 12-foot inside shoulders) and flanking 12-foot outside shoulders. Interchange improvements will occur at the SR 611 Interchange (Exit 303), US 209/Business, and US 209/Dreher Avenue Interchange areas (Exits 304, 305, and 306).

Alternative 2-B

After completion of the Phase I Alternatives Analysis, Alternatives 1F and 1G were combined into Alternative 2-B due to similarities in provided movements. As part of this Alternative, interchange improvements will occur at the SR 611 Interchange (Exit 303), US 209/Business, 209/Dreher Avenue Interchanges (Exits 304, 305, and 306), and SR 191 Interchange (Exit 307), respectively.

Due to the proximity of Exit 305 to Exit 304, the two interchanges function as one. In comparison to Phase I, the movements at Exit 305 have had horizontal and vertical changes. The connection of the ramps to West Main St. has changed slightly to reduce overall impacts and improve the geometry of West Main St. In addition, improvements to West Main St. will start at Bridge St. and terminate just east of Exit 305. Exit 306 was removed to simplify and reduce the number of exits within the corridor.

At the SR 191 Interchange (Exit 307), the eastbound on and off ramps to I-80 have been relocated to tie into the PA-611 Bridge. The new locations of these ramps reduce the overall impact as well as pull the eastbound and westbound movements closer together.

Alternative 2-D

In comparison to Phase I Alternatives Analysis, Alternative 2-D is similar to Alternative 1B. As part of this Alternative, interchange improvements will occur at the SR 611 Interchange (Exit 303), US 209/Business, 209/Dreher Avenue Interchanges (Exits 304, 305, and 306), and SR 191 Interchange areas (Exit 307).

The SR 611 Interchange (Exit 303) diamond configuration was moved west to tie into the main intersection with the shopping center on PA-611. As such, the improvements on PA-611 will extend east and tie into the existing roadway configuration.

At the US 209/Business 209/Dreher Avenue Interchanges (Exits 304, 305, and 306), significant horizontal and vertical changes have occurred for ramps as well as the mainline. With Exit 303 relocated to the west, there is now adequate spacing to place the I-80 westbound exit ramp to PA-611 at Exit 303 rather than begin it at Exit 304. Similarly, the roadway improvements on West Main St. are identical to Alternative 2-B, which will begin at Bridge St and terminate east of Exit 305. At Exit 305, the roadway improvements are identical to Alternative 2-B. In addition, consistent with Alternative 2-B, Exit 306 was removed to simplify and reduce the number of exits within the corridor and improvements at the SR 191 Interchange are identical.

It should be noted that the above alternatives considered in this analysis are based on the preliminary engineering plans that were on display during the December 2014 open-house meetings. Since December 2014, several minor modifications to the alignments have occurred and are not included in this study. Most of the modifications are to Alternative 2-D which was not studied in detail in support of this air study. There was also a minor modification to the roadway profile for CD road between Main Street and Dreher Avenue for Alternative 2-B which was considered inconsequential and not included in the air study.

III. Regulations / Criteria

Under the National Environmental Policy Act (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 National Ambient Air Quality Standards (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.

Table 1
National Ambient Air Quality Standards

Pollutant [links to historical tables of NAAQS reviews]		Primary/ Secondary	Averaging Time	Level	Form	
Carbon Monoxide (CO)		primary	8 hours	9 ppm	Not to be exceeded more than once per year	
			1 hour	35 ppm		
Lead (Pb)		primary and secondary	Rolling 3 month period	0.15 $\mu\text{g}/\text{m}^3$ ⁽¹⁾	Not to be exceeded	
Nitrogen Dioxide (NO₂)		primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years	
		primary and secondary	1 year	53 ppb ⁽²⁾	Annual Mean	
Ozone (O₃)		primary and secondary	8 hours	0.070 ppm ⁽³⁾	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years	
Particle Pollution (PM)		PM _{2.5}	primary	1 year	12.0 $\mu\text{g}/\text{m}^3$	annual mean, averaged over 3 years
			secondary	1 year	15.0 $\mu\text{g}/\text{m}^3$	annual mean, averaged over 3 years
			primary and secondary	24 hours	35 $\mu\text{g}/\text{m}^3$	98th percentile, averaged over 3 years
		PM ₁₀	primary and secondary	24 hours	150 $\mu\text{g}/\text{m}^3$	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO₂)		primary	1 hour	75 ppb ⁽⁴⁾	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years	
		secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year	

(1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 $\mu\text{g}/\text{m}^3$ as a calendar quarter average) also remain in effect.

(2) The level of the annual NO₂ standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.

(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O₃ standards additionally remain in effect in some areas. Revocation of the previous (2008) O₃ standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.

(4) The previous SO₂ standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which implementation plans providing for attainment of the current (2010) standard have not been submitted and approved and which is designated nonattainment under the previous SO₂ standards or is not meeting the requirements of a SIP call under the previous SO₂ standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the require NAAQS.

Source: Table and footnotes above are excerpted from the US Environmental Protection Agency
Website: <http://http://www3.epa.gov/ttn/naaqs/criteria.html>

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 implementation plan (SIP).

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 requirements apply for plans and programs, while project-level hot-spot analysis requirements apply for projects.

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.

IV. Carbon Monoxide Analysis

The purpose of this hot-spot analysis is to identify “worst-case” carbon monoxide (CO) concentrations throughout the project corridor to demonstrate compliance with the CO NAAQS as a result of the proposed improvements.

A quantitative CO hot-spot study was conducted based upon the thresholds established in Figure 2 from PennDOT’s *Project-Level Air Quality Handbook, Publication 321*:

- 1) The project area is non-exempt from project-level analysis per Table 2 of 40 CFR 93.126;
- 2) The Design Year traffic in the project area is greater than 125,000 AADT (Design Year Build (2045) AADT is estimated to range from 131,295 to 132,814 along the I-80 mainline in the project area); and
- 3) Opening/Design Year LOS at any signalized intersection (overall) or mainline un-signalized approach is LOS D, E or F. Several freeway segments, ramp merges, ramp diverges, and ramp terminus intersections (signalized and un-signalized) will have LOS D or E in

the various 2045 Design Year Build Alternatives. One freeway segment at the western project limits will have LOS F in all three 2045 Design Year Build Alternatives. For more details, see Tables 10-13 in Appendix C.

A quantitative CO hot-spot study was conducted based upon the above criteria being met. 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 PennDOT's *Project-Level Air Quality Handbook, Publication 321, (December 2015)*.

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 (MOVES2014) model. Specific modeling inputs including vehicle age distribution and fuel type formulations were obtained from PennDOT. In addition, the roadway grade information required for input into MOVES2014 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 MOVES model, the peak hour traffic volumes and the posted speed for that hour were used, which represent the system wide worst case traffic. In addition, the urban restricted and unrestricted road types were selected for the project road segments. Source type hour fractions for each roadway link are based on the vehicle populations data set provided by PennDOT.

Once generated using the MOVES2014 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 rates, 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), Opening Year No-Build and Build (2025), and Design Year No-Build and Build (2045) 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**). These standards have been designed and adapted by EPA 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 could have continuous access to the immediate vicinity. In general, the worst-case 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, all modeling was performed to represent wintertime (January) conditions.

In order to identify the worst-case locations to be evaluated in the CO hot-spot analysis, EPA guidance recommends 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 various Alternatives to consider. After a thorough review of the detailed traffic data, Alternative 2-B was selected for detail study since it carried the highest traffic volumes when compared to Alternative 2-A and Alternative 2-D and is considered worst case. For reference purposes, Alternative 2-A can be referenced on **Figure 2** while Alternative 2-D can be referenced on **Figure 3**. In addition, PM peak hour volumes are generally higher than AM peak hour volumes along the project corridor under Design Year 2045 conditions. As a result, Opening Year Build (2025) and Design Year Build (2045) PM peak hour traffic volumes were used in the CO hotspot analysis and are included in **Appendix C**.

For the purposes of the CO hot-spot analysis, several receptors were selected adjacent to Alternative 2-B where traffic has the largest potential to queue along the project corridor. These selected sensitive receptors adjacent to Alternative 2-B 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 on page 592 in **Appendix C**. For the purposes of the CO hot-spot analysis, the worst-case signalized intersection selected for the assessment is identified below:

- Ann St & Broad St / 5th St & Main Street (Five Points Intersection)

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, having a comparable LOS. Additionally, the intersection is the most complex intersection in the project area with five approach and queue segments. For the MOVES/CAL3QHC emissions quantification process, the highest traffic volumes and signal operations lead to the highest CO concentrations. 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. For all these reasons, this intersection was chosen as worst-case. Although no improvements are proposed, all intersection modeling included the existing footprint in each analysis year. 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 4-5**.

CO Receptor Locations

As stipulated by EPA's *Guideline for Modeling Carbon Monoxide from Roadway Intersections*, each receptor represents an area where the public could 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.

Sensitive receptors were selected along Alternative 2-B where the maximum CO concentrations would be expected to occur. 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 all other locations within the project corridor will also remain below the CO NAAQS, as well as for Alternatives 2-A and 2-D. **Figure 4-1--Figure 4-5** show the sensitive receptor locations adjacent to the proposed build alternative that were selected for analysis.

Analysis Methodologies & Results

The CAL3QHC air quality dispersion model was used to predict the worst-case CO concentrations at each receptor location shown in **Table 2** and **Figure 4-1--Figure 4-5** for Existing (2014), Opening Year Build (2025) and Design Year Build (2045) conditions.

Worst-case traffic operations and atmospheric conditions were incorporated to predict worst-case CO concentrations. Maximum CO concentrations, calculated by adding together the background concentration to the projected peak CO concentration for all locations, scenarios, and years considered in the analysis area, are shown in **Table 2**. The 1-hour and 8-hour background concentrations of 3.0 ppm and 1.5 ppm, respectively, were obtained from PennDOT's *Project-Level Air Quality Handbook*. In addition, a persistence factor of 0.7 was used to project the 8-hour CO concentrations as stipulated in EPA guidance.

Table 2 provides a summary of the peak CO levels at each sensitive receptor location selected along the proposed project corridor for each analysis year as shown in **Figure 4-1--Figure 4-5**. The highest 1-hour and 8-hour CO concentrations under Existing (2013) conditions were projected at 4.0 and 2.2 ppm, respectively, including the assumed background concentration of 3.0 ppm for the 1-hour standard and 1.5 ppm for the 8-hour standard. Under Opening Year No-Build (2025) conditions, the highest 1-hour and 8-hour CO concentrations were projected to be 3.6 and 1.9 ppm, respectively. Under Opening Year Build (2025) conditions, the highest 1-hour and 8-hour CO concentrations were projected to be 3.5 and 1.9 ppm, respectively. Under Design Year No-Build (2045) conditions, the highest 1-hour and 8-hour CO concentrations were projected to be 3.3 and 1.7 ppm, respectively. Under Design Year Build (2045) conditions, the highest 1-hour and 8-hour CO concentrations were projected to be 3.3 and 1.7 ppm, respectively.

Table 3 provides a summary of the peak CO levels at each sensitive receptor location selected along the signalized intersection for each analysis year as shown in **Figure 4-5**. The highest 1-hour and 8-hour CO concentrations under Existing (2013) conditions were projected at 4.5 and 2.6 ppm, respectively, including the assumed background concentration of 3.0 ppm for the 1-hour standard and 1.5 ppm for the 8-hour standard. Under Opening Year No-Build (2025) conditions, the highest 1-hour and 8-hour CO concentrations were projected to be 3.5 and 1.9 ppm, respectively. Under Opening Year Build (2025) conditions, the highest 1-hour and 8-hour CO concentrations were projected to be 3.5 and 1.9 ppm, respectively. Under Design Year No-Build (2045) conditions, the highest 1-hour and 8-hour CO concentrations were projected to be 3.2 and 1.6 ppm,

respectively. Under Design Year Build (2045) conditions, the highest 1-hour and 8-hour CO concentrations were projected to be 3.1 and 1.6 ppm, respectively.

Under all scenarios at each receptor location evaluated, the highest 1-hour and 8-hour CO concentrations are projected to be well below the CO NAAQS of 35 ppm and 9 ppm, respectively. Since Alternative 2-B carried the highest traffic volumes when compared to all other Alternatives, it is also assumed that CO concentrations related to Alternative 2-A and Alternative 2-D will also remain below the CO NAAQS. 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 under Alternative 2-B, then it is assumed that all other locations within the project corridor will also remain below the CO NAAQS. As such, this analysis has concluded that the project will not cause or contribute to a violation of the CO NAAQS.

V. 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 the Monroe County, an area designated as attainment for the PM_{2.5} and PM₁₀ NAAQS. The project does not require a project-level conformity determination. According to the PM_{2.5} and PM₁₀ hot-spot analysis requirements established in the March 10, 2006 final transportation conformity rule (71 FR 12468), no further project-level air quality analysis for these pollutants is required.

VI. 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.

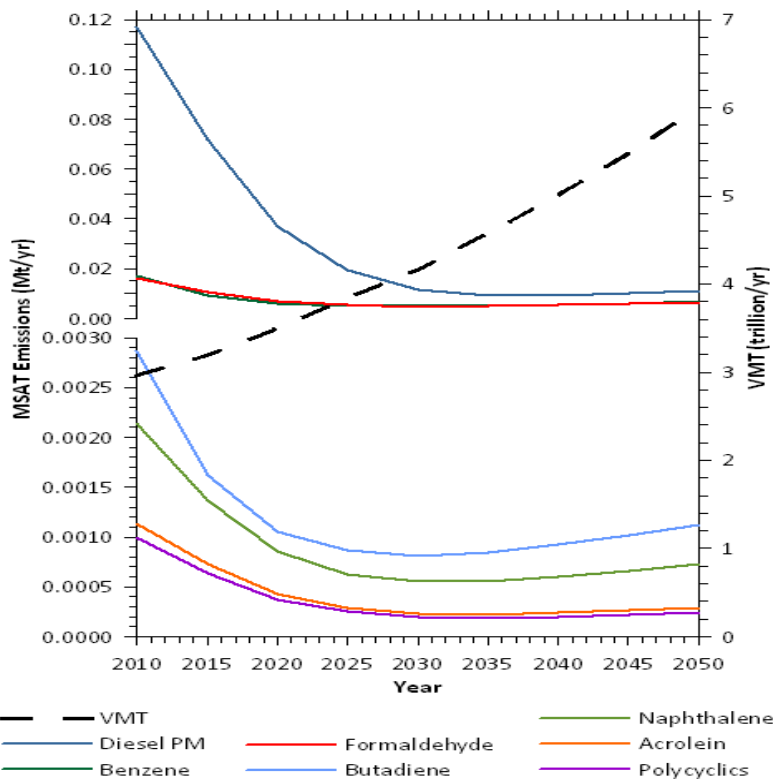
On September 30, 2009, FHWA issued *Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents*. This interim guidance update reflects recent regulatory changes, addresses stakeholder requests to broaden the horizon years of emission trends performed with MOBILE6.2, and updates stakeholders 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 MSATs, such as the use of 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 MSATs at the project level, it is possible to qualitatively assess the levels of future MSAT emissions under the project.

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



Although a qualitative analysis cannot identify and measure health impacts from MSATs, it can give a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions among Transportation Project Alternatives*, found at:

http://www.fhwa.dot.gov/environment/air_quality/air_toxics/research_and_analysis/mobile_source_air_toxics/msatemissions.cfm.

The project is best characterized as one with “low potential MSAT effects” since design year traffic is projected to be less than 140,000 to 150,000 annual average daily traffic (AADT) thresholds that are provided in the FHWA MSAT guidance. The AADT for the I-80 project area mainline is estimated at 131,295 under Design Year Build (2045) conditions for Alternative 2-B and 132,775 under Design Year No-Build (2045) conditions. As a result, a qualitative assessment of emissions projections was prepared in accordance with Appendix B of the guidance. Project specific elements, including increased travel speeds and improvements to level of service (LOS) and the overall effects on MSAT emissions, are discussed below. As stipulated in the guidance, additional discussion is required including information that is incomplete or unavailable for a project-specific assessment of MSAT impacts. Additionally, as mentioned above, air toxics is an emerging field and current scientific techniques, tools, and data are not sufficient to accurately estimate human health impacts that would result from the transportation project. Appendix C from the guidance is also included in the discussions below to satisfy this portion of the requirements.

When analyzing the project, the amount of MSAT emissions emitted is generally proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix and diesel vehicle percentages remain constant for each alternative. On a regional basis, 2045 VMT on the roadway network for Alternative 2-B in the project area is anticipated to increase approximately 1.0% when compared to the 2045 No-Build scenario. In addition, similar results are anticipated for Alternative 2-A and Alternative 2-D since each Alternative carries similar traffic volumes.

As such, regional MSAT emissions in the project area are expected to be similar as a result of this project in comparison to the No-Build scenario. Also, regardless of whether the project is built, MSAT emissions are anticipated to be significantly lower than present levels in the design year as a result of EPA's national control programs (supported by **Exhibit A**) that are projected to reduce annual MSAT emissions by 83 percent from 2010 to 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures.

The I-80 Reconstruction Project may have the effect of moving some traffic closer to nearby homes, schools, and businesses; therefore, under the Build Alternative, there may be localized areas where traffic volumes and 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.

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 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.

Moreover, EPA regulations for vehicle engines and fuels will cause overall MSAT emissions to decline significantly over the next several decades. This trend will both reduce the background level of MSAT as well as the possibility of even minor MSAT emission increases from this project.

VII. Conformity Status of the Project

The project has also been evaluated with respect to regional air quality concerns. The Clean Air Act Amendments (CAAA) of 1990 mandates improvements to the nation's air quality. The final conformity regulations promulgated by the US EPA in 1997, as part of 40 CFR Part 93, require that transportation plans and programs conform to the State Implementation Plan (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, Monroe County has been designated as attainment for the eight-hour ozone standard; therefore, the project is not subject to regional transportation conformity requirements. Therefore, all regional conformity requirements have been satisfied.

VIII. Conclusion

Based on the results of the CO hotspot analysis, peak CO concentrations for Alternative 2-B are predicted to be well below the CO NAAQS in both the Opening Year Build (2025) and Design Year Build (2045) scenarios for each of the analysis locations analyzed. Therefore, it is anticipated that all other locations within the project corridor, regardless of the Alternative chosen, will also remain below the CO NAAQS and no mitigation measures are necessary or required.

Finally, the project is not expected to cause or contribute to any violations of the NAAQS, worsen any existing violations, or interfere with the attainment of any applicable NAAQS.

Pennsylvania Department of Transportation

INTERSTATE 80 RECONSTRUCTION PROJECT

AIR QUALITY TECHNICAL REPORT FIGURES

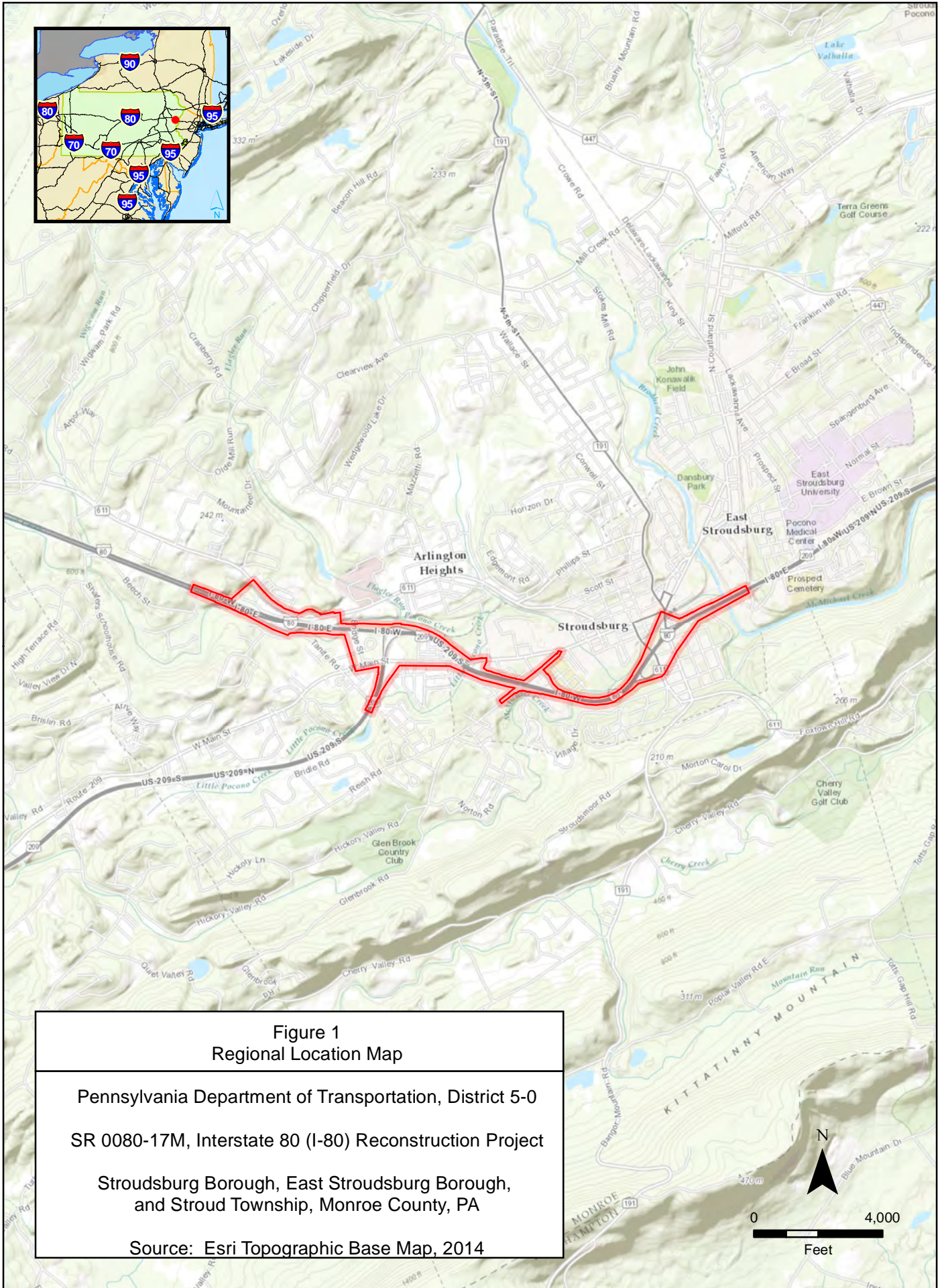
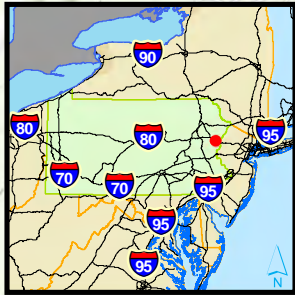
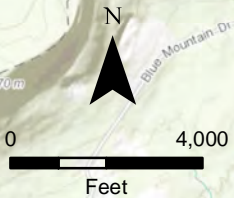


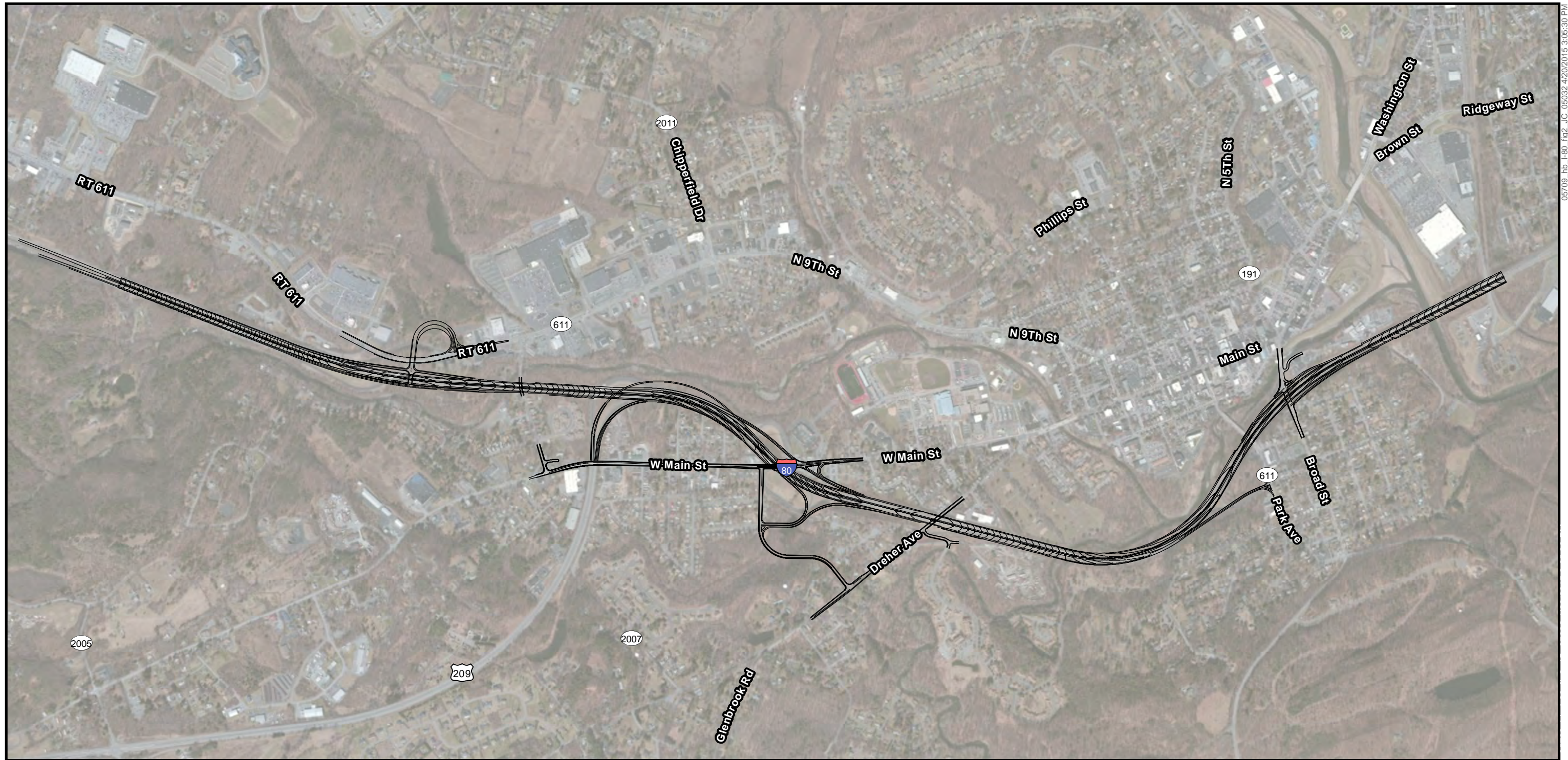
Figure 1
Regional Location Map

Pennsylvania Department of Transportation, District 5-0
SR 0080-17M, Interstate 80 (I-80) Reconstruction Project

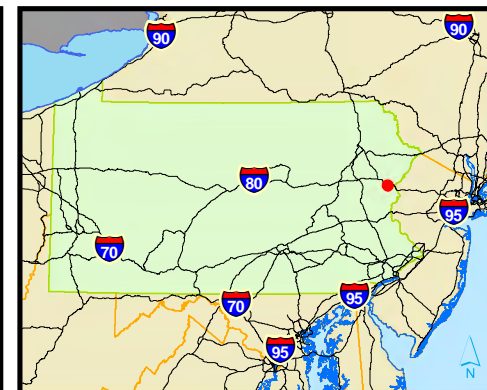
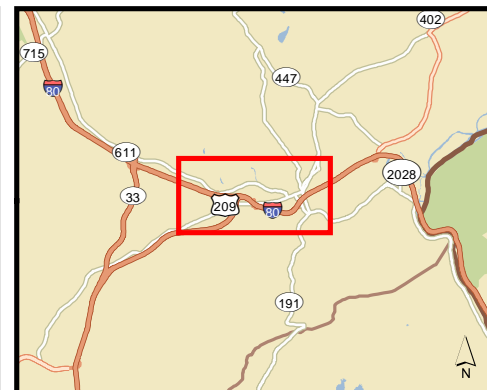
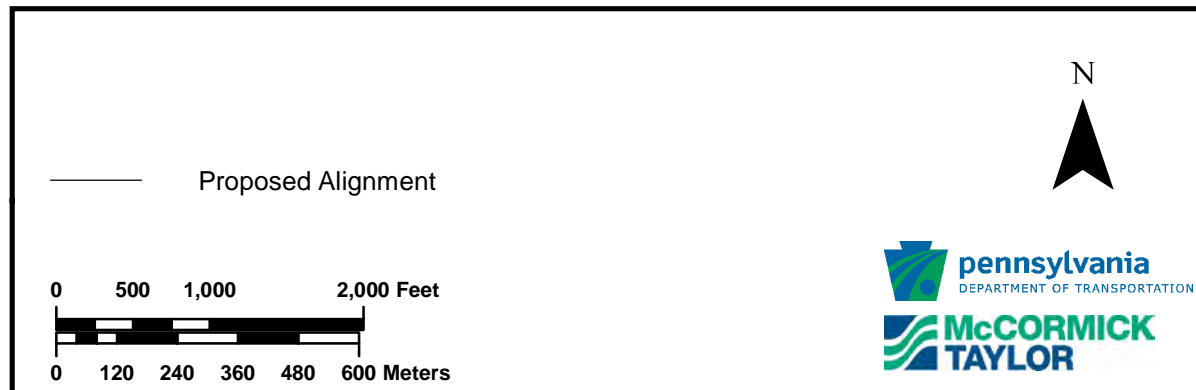
Stroudsburg Borough, East Stroudsburg Borough,
and Stroud Township, Monroe County, PA

Source: Esri Topographic Base Map, 2014





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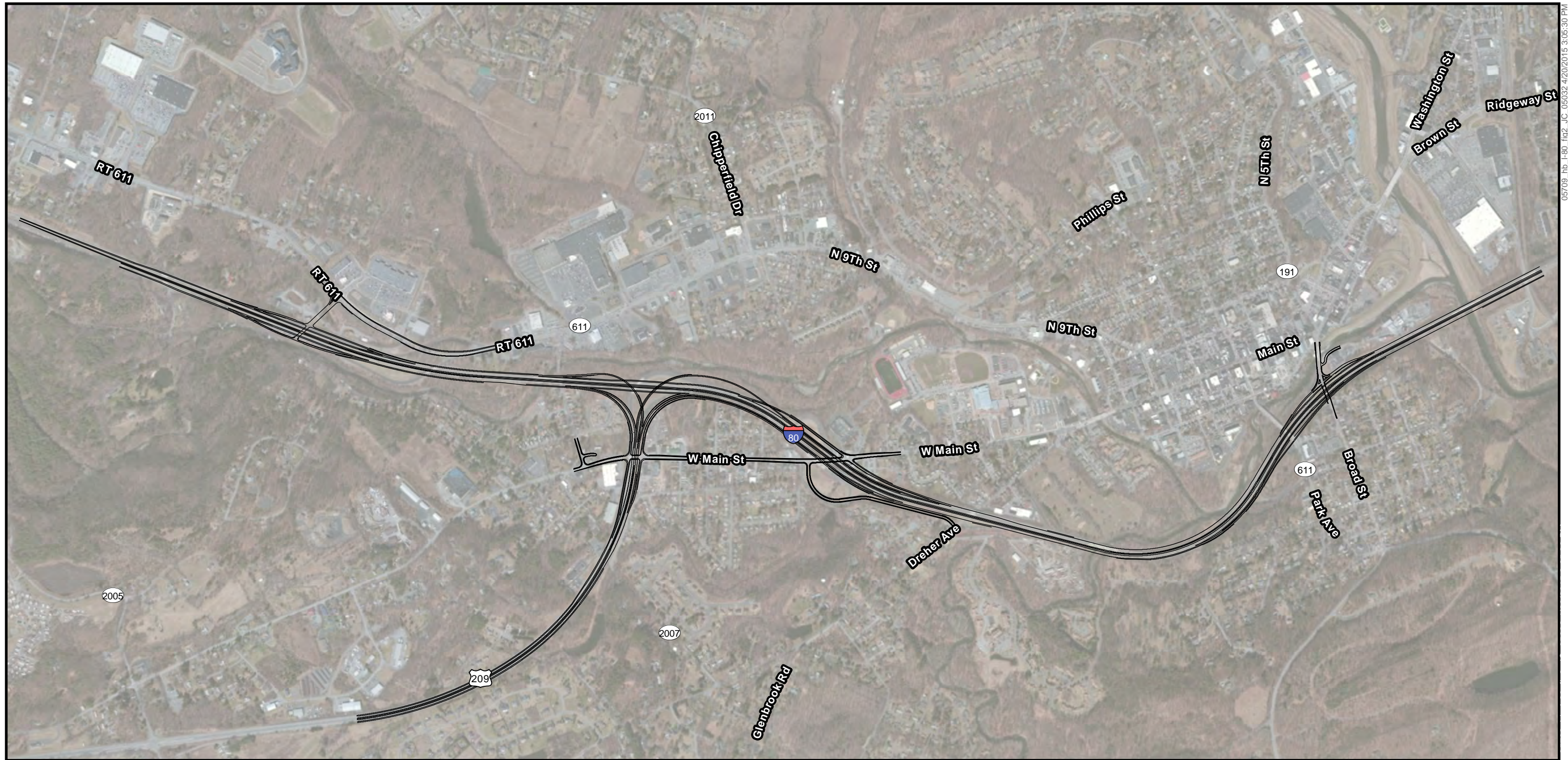


Alternative 2A
Figure 2

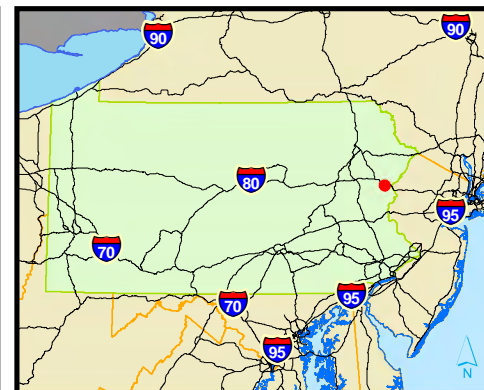
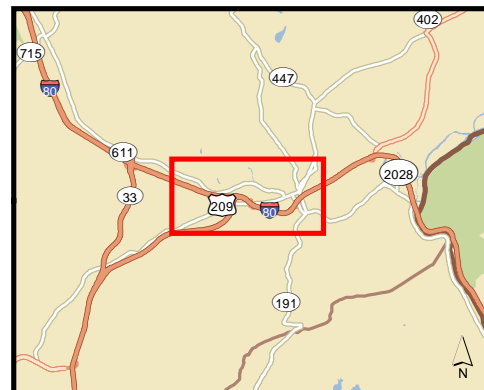
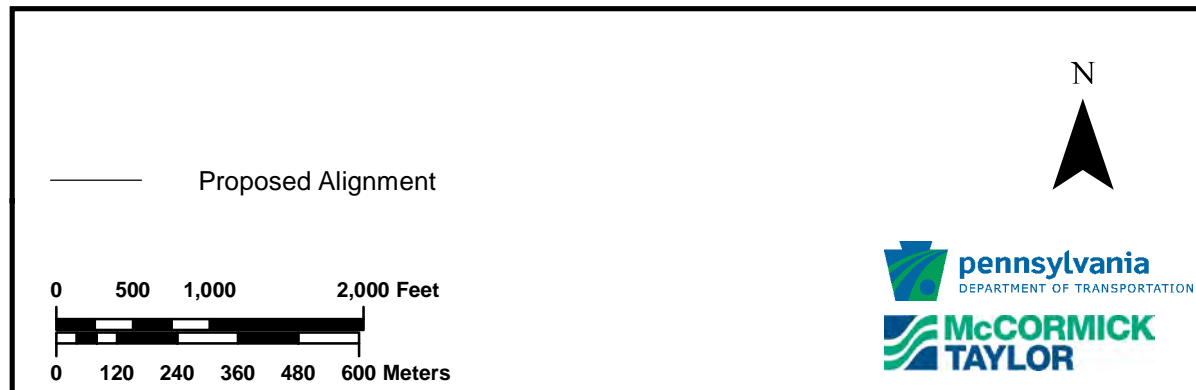
Pennsylvania Department of Transportation, District 5-0
SR 0080-17M, Interstate 80 (I-80) Reconstruction Project

Stroudsburg Borough, East Stroudsburg Borough,
and Stroud Township, Monroe County, PA

Aerial Source: Esri & DigitalGlobe, 2012



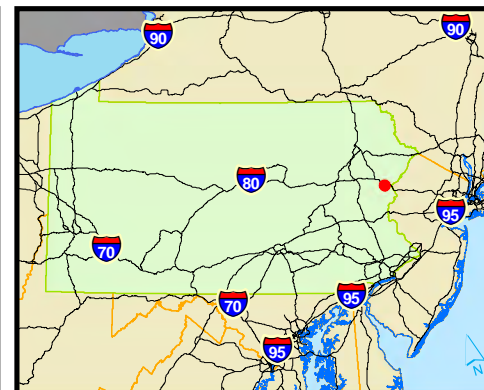
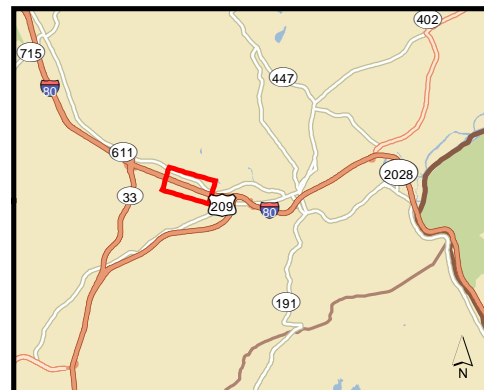
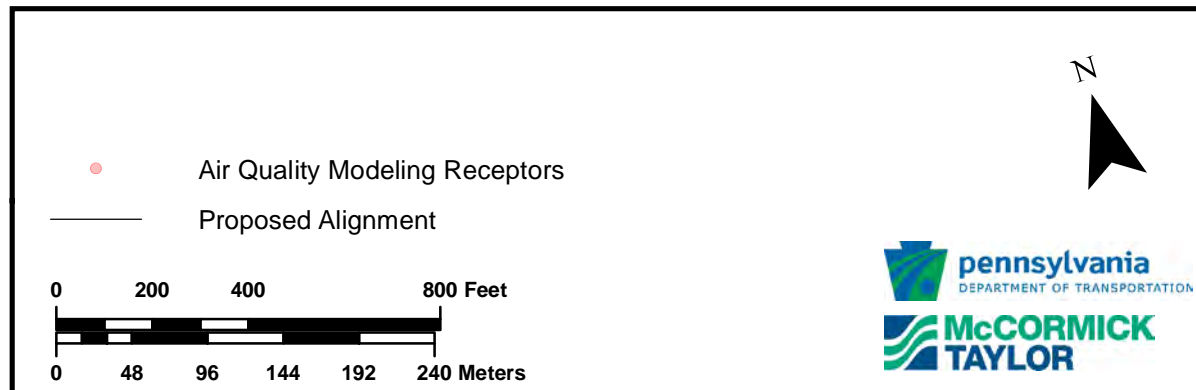
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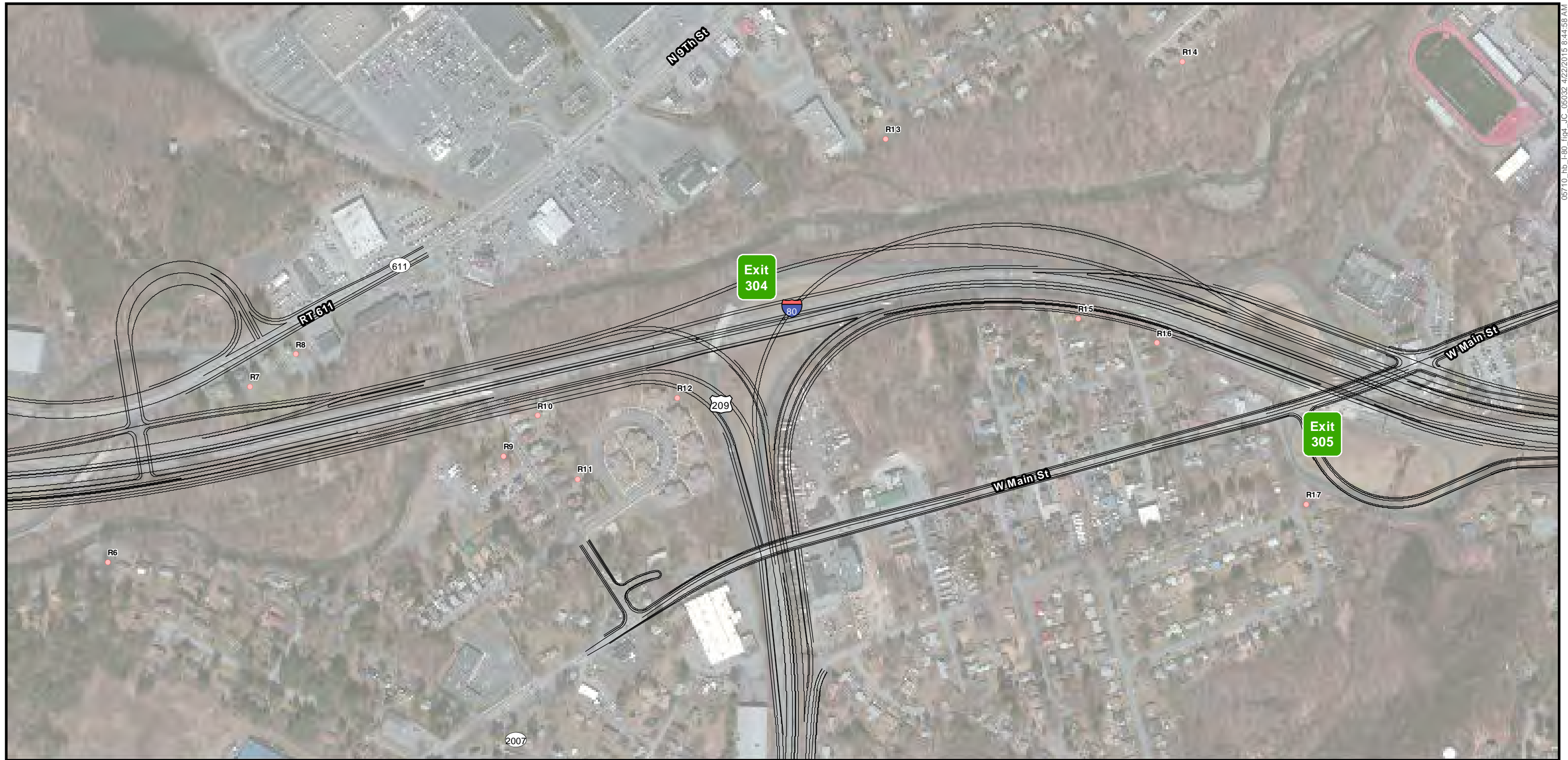
Alternative 2D
 Figure 3
 Pennsylvania Department of Transportation, District 5-0
 SR 0080-17M, Interstate 80 (I-80) Reconstruction Project
 Stroudsburg Borough, East Stroudsburg Borough,
 and Stroud Township, Monroe County, PA
 Aerial Source: Esri & DigitalGlobe, 2012



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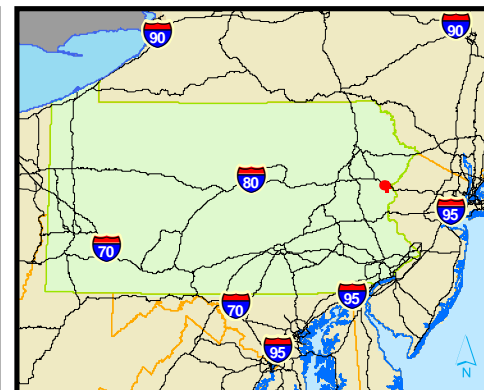
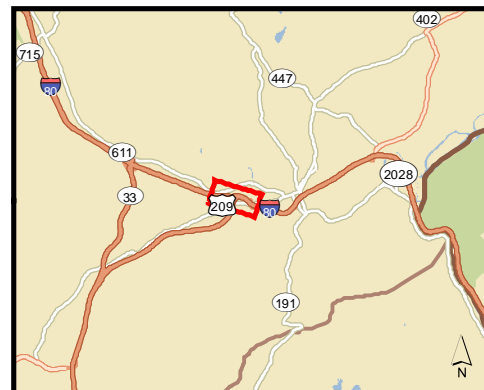
Alternative 2B
Figure 4-1
Pennsylvania Department of Transportation, District 5-0
SR 0080-17M, Interstate 80 (I-80) Reconstruction Project
Stroudsburg Borough, East Stroudsburg Borough,
and Stroud Township, Monroe County, PA
Aerial Source: Esri & DigitalGlobe, 2012



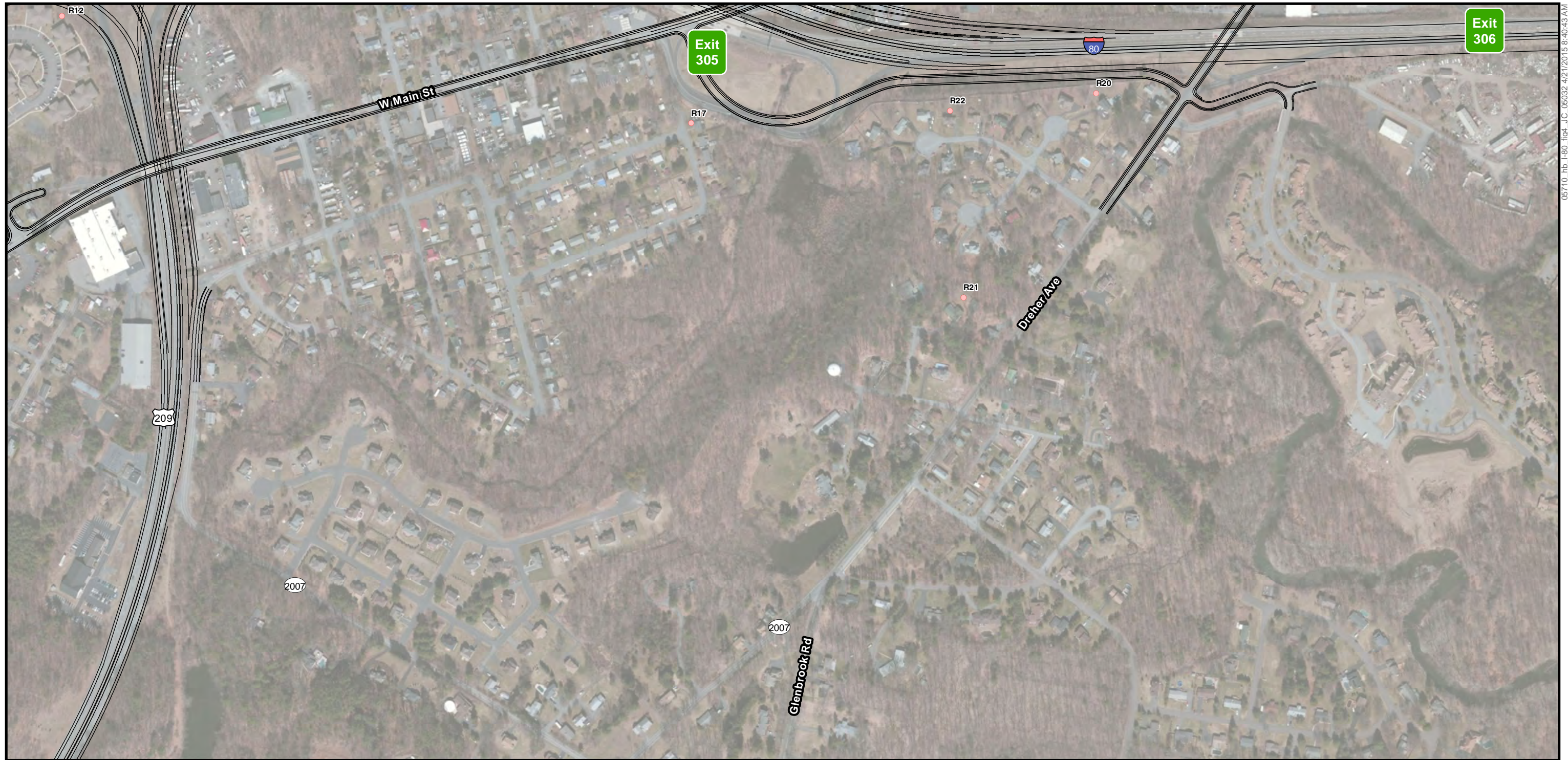
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● Air Quality Modeling Receptors
 Proposed Alignment

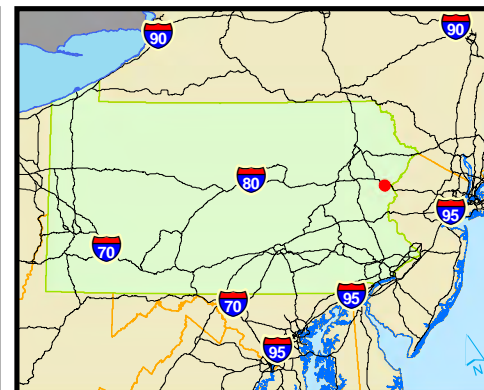
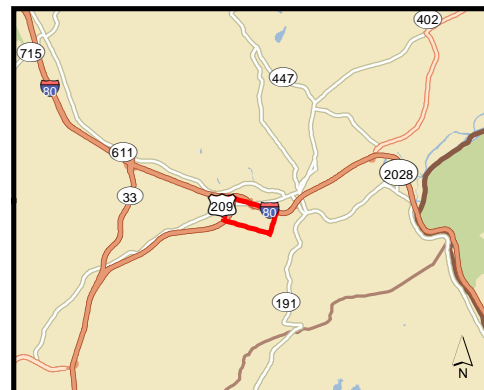
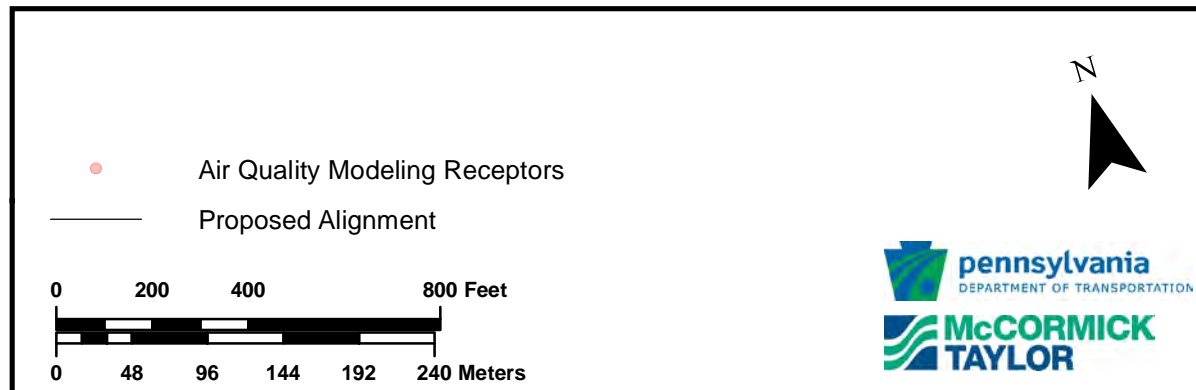
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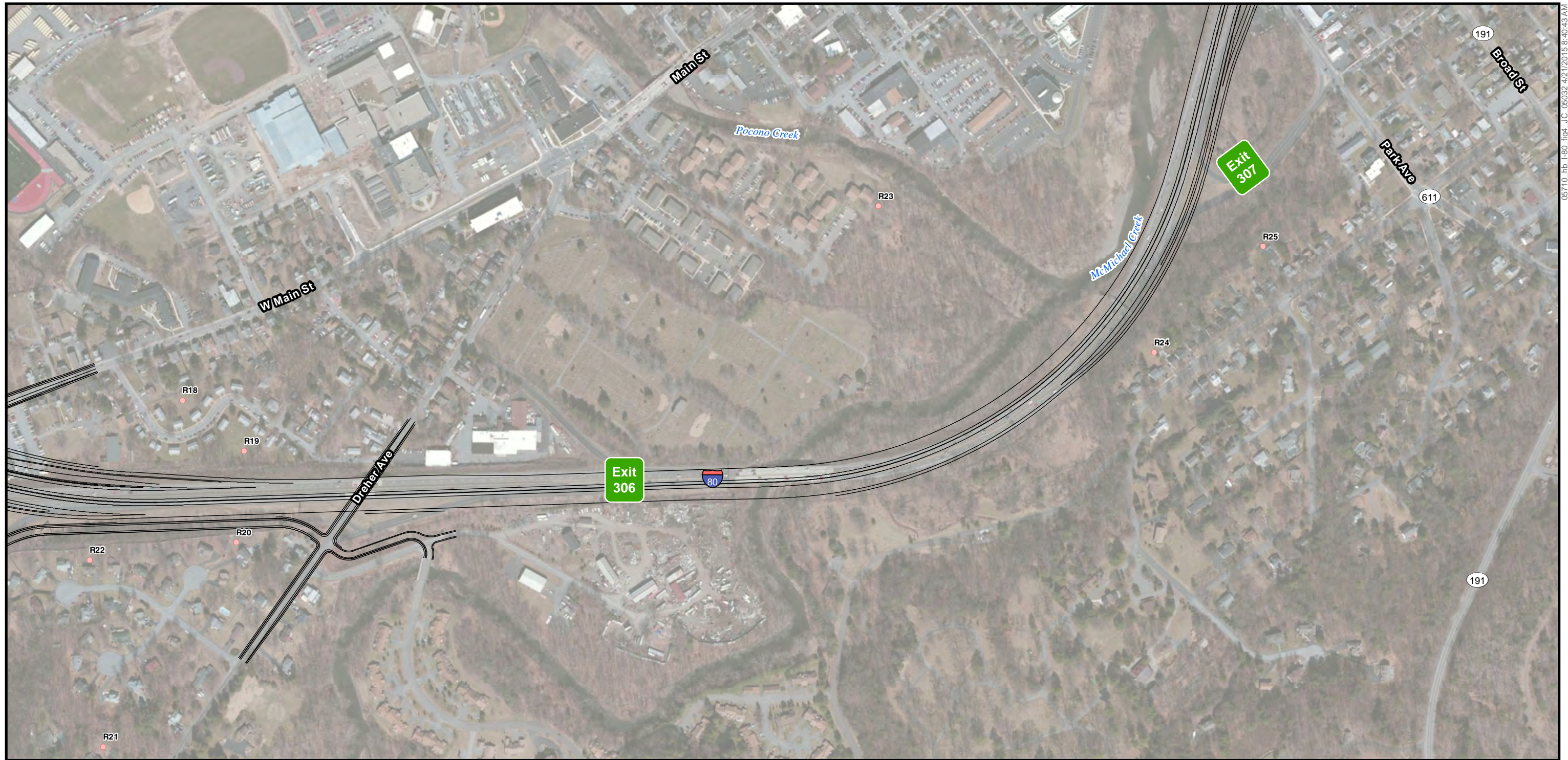
Alternative 2B
 Figure 4-2
 Pennsylvania Department of Transportation, District 5-0
 SR 0080-17M, Interstate 80 (I-80) Reconstruction Project
 Stroudsburg Borough, East Stroudsburg Borough,
 and Stroud Township, Monroe County, PA
 Aerial Source: Esri & DigitalGlobe, 2012



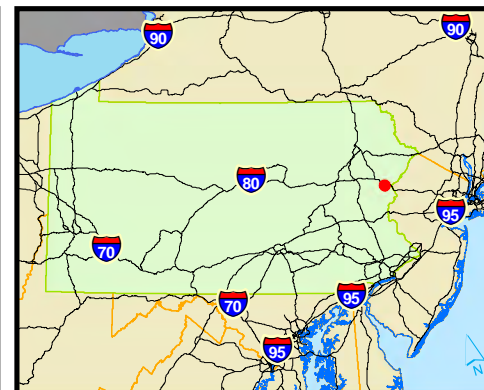
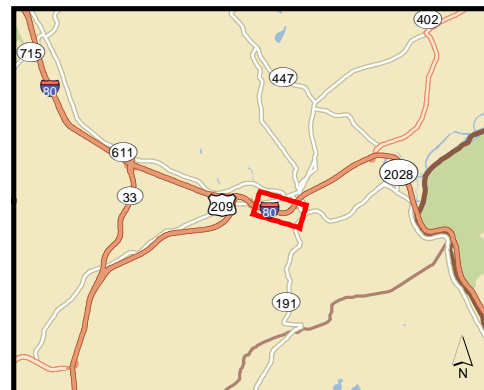
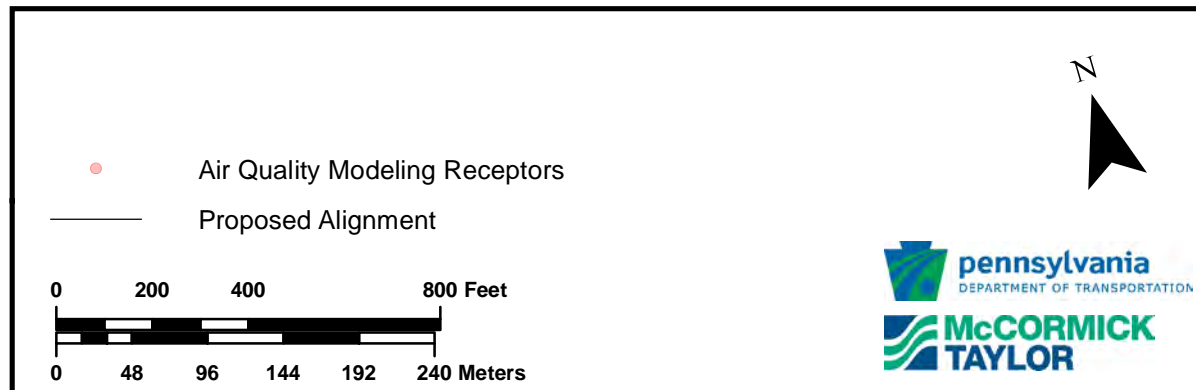
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Alternative 2B
Figure 4-3
Pennsylvania Department of Transportation, District 5-0
SR 0080-17M, Interstate 80 (I-80) Reconstruction Project
Stroudsburg Borough, East Stroudsburg Borough,
and Stroud Township, Monroe County, PA
Aerial Source: Esri & DigitalGlobe, 2012



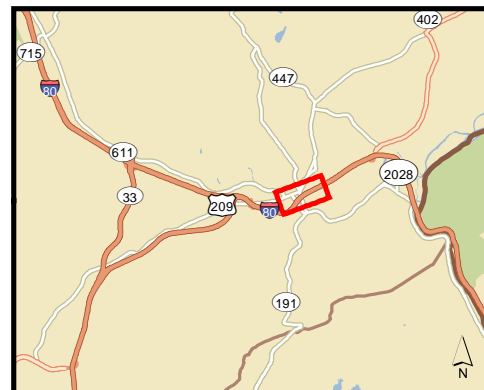
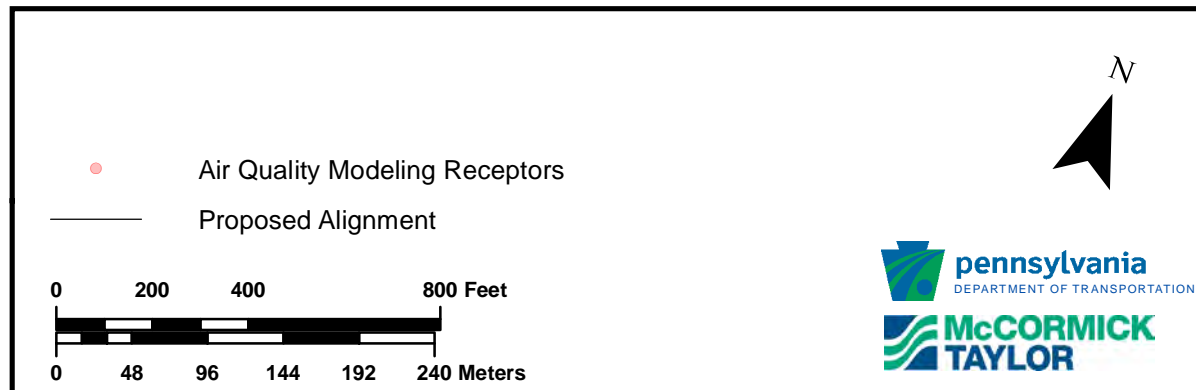
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Alternative 2B
 Figure 4-4
 Pennsylvania Department of Transportation, District 5-0
 SR 0080-17M, Interstate 80 (I-80) Reconstruction Project
 Stroudsburg Borough, East Stroudsburg Borough,
 and Stroud Township, Monroe County, PA
 Aerial Source: Esri & DigitalGlobe, 2012



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Alternative 2B
 Figure 4-5
 Pennsylvania Department of Transportation, District 5-0
 SR 0080-17M, Interstate 80 (I-80) Reconstruction Project
 Stroudsburg Borough, East Stroudsburg Borough,
 and Stroud Township, Monroe County, PA
 Aerial Source: Esri & DigitalGlobe, 2012

Pennsylvania Department of Transportation

INTERSTATE 80 RECONSTRUCTION PROJECT

AIR QUALITY TECHNICAL REPORT TABLES

Table 2
Carbon Monoxide Hot-Spot Analysis
Alternative 2B: Peak 1-Hour and 8-Hour CO Concentration Summary (ppm)

	Receptor ID	Existing (2013)		2025 Opening Year No-Build		2025 Opening Year Build Alternative 2B		2045 Design Year No-Build		2045 Design Year Build Alternative 2B	
		1-Hour	8-Hour	1-Hour	8-Hour	1-Hour	8-Hour	1-Hour	8-Hour	1-Hour	8-Hour
I-80 Corridor / Stroudsburg PA	R-1	3.5	1.9	3.2	1.6	3.2	1.6	3.1	1.6	3.1	1.6
	R-2	3.5	1.9	3.2	1.6	3.3	1.7	3.1	1.6	3.2	1.6
	R-3	3.7	2.0	3.3	1.7	3.3	1.7	3.2	1.6	3.2	1.6
	R-4	3.5	1.9	3.2	1.6	3.2	1.6	3.1	1.6	3.2	1.6
	R-5	3.4	1.8	3.2	1.6	3.2	1.6	3.1	1.6	3.1	1.6
	R-6	3.2	1.6	3.1	1.6	3.1	1.6	3.1	1.6	3.1	1.6
	R-7	3.4	1.8	3.1	1.6	3.2	1.6	3.1	1.6	3.1	1.6
	R-8	3.5	1.9	3.2	1.6	3.1	1.6	3.2	1.6	3.1	1.6
	R-9	3.4	1.8	3.1	1.6	3.1	1.6	3.1	1.6	3.1	1.6
	R-10	3.6	1.9	3.3	1.7	3.3	1.7	3.2	1.6	3.1	1.6
	R-11	3.6	1.9	3.1	1.6	3.1	1.6	3.1	1.6	3.0	1.5
	R-12	3.3	1.7	3.1	1.6	3.2	1.6	3.1	1.6	3.1	1.6
	R-13	3.2	1.6	3.1	1.6	3.1	1.6	3.0	1.5	3.0	1.5
	R-14	3.2	1.6	3.1	1.6	3.1	1.6	3.0	1.5	3.0	1.5
	R-15	3.2	1.6	3.1	1.6	3.4	1.8	3.1	1.6	3.3	1.7
	R-16	4.0	2.2	3.6	1.9	3.4	1.8	3.3	1.7	3.2	1.6
	R-17	3.7	2.0	3.5	1.9	3.0	1.5	3.3	1.7	3.0	1.5
	R-18	3.4	1.8	3.2	1.6	3.2	1.6	3.1	1.6	3.1	1.6
	R-19	3.4	1.8	3.2	1.6	3.3	1.7	3.1	1.6	3.2	1.6
	R-20	4.2	2.3	3.5	1.9	3.5	1.9	3.3	1.7	3.2	1.6
	R-21	3.9	2.1	3.3	1.7	3.0	1.5	3.2	1.6	3.0	1.5
	R-22	3.3	1.7	3.2	1.6	3.4	1.8	3.1	1.6	3.1	1.6
	R-23	3.7	2.0	3.4	1.8	3.1	1.6	3.3	1.7	3.0	1.5
	R-24	3.1	1.6	3.1	1.6	3.5	1.9	3.0	1.5	3.2	1.6
	R-25	3.8	2.1	3.5	1.9	3.2	1.6	3.2	1.6	3.1	1.6
	R-26	3.5	1.9	3.2	1.6	3.3	1.7	3.1	1.6	3.2	1.6
	R-27	3.6	1.9	3.1	1.6	3.2	1.6	3.1	1.6	3.1	1.6
	R-28	3.5	1.9	3.3	1.7	3.1	1.6	3.2	1.6	3.0	1.5
	R-29	3.6	1.9	3.3	1.7	3.4	1.8	3.2	1.6	3.2	1.6
	R-30	3.4	1.8	3.2	1.6	3.3	1.7	3.2	1.6	3.2	1.6

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 3.0 ppm.
- 8-Hour concentrations were calculated by applying a persistence factor of 0.7 to the 1-Hour concentration, as per the PennDOT Publication 321, Project Level Air Quality Handbook, dated October 18, 2013. 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 1.5 ppm background concentration as per the PennDOT Publication 321, Section 2.4.6.
- Highlighted cells represent highest CO concentrations per analysis year.

Table 3
Carbon Monoxide Hot-Spot Analysis
Peak 1-Hour and 8-Hour CO Concentration Summary (ppm)

	Receptor ID	Existing (2013)		2025 Opening Year No-Build		2025 Opening Year Build Alternative 2B		2045 Design Year No-Build		2045 Design Year Build Alternative 2B	
		1-Hour	8-Hour	1-Hour	8-Hour	1-Hour	8-Hour	1-Hour	8-Hour	1-Hour	8-Hour
180 - Stroudsburg, PA - 5 Points Intersection	A-1	3.6	1.9	3.2	1.6	3.2	1.6	3.0	1.5	3.0	1.5
	A-2	3.7	2.0	3.1	1.6	3.1	1.6	3.0	1.5	3.0	1.5
	A-3	3.7	2.0	3.2	1.6	3.2	1.6	3.0	1.5	3.0	1.5
	A-4	3.9	2.1	3.3	1.7	3.3	1.7	3.1	1.6	3.1	1.6
	A-5	3.7	2.0	3.2	1.6	3.2	1.6	3.1	1.6	3.1	1.6
	A-6	3.5	1.9	3.2	1.6	3.2	1.6	3.1	1.6	3.1	1.6
	A-7	3.4	1.8	3.2	1.6	3.2	1.6	3.1	1.6	3.1	1.6
	A-8	3.5	1.9	3.2	1.6	3.2	1.6	3.1	1.6	3.1	1.6
	A-9	3.6	1.9	3.2	1.6	3.2	1.6	3.1	1.6	3.1	1.6
	A-10	4.1	2.3	3.2	1.6	3.2	1.6	3.1	1.6	3.1	1.6
	A-11	4.0	2.2	3.2	1.6	3.2	1.6	3.1	1.6	3.1	1.6
	A-12	4.0	2.2	3.4	1.8	3.4	1.8	3.0	1.5	3.1	1.6
	A-13	4.1	2.3	3.4	1.8	3.5	1.9	3.1	1.6	3.1	1.6
	A-14	4.2	2.3	3.4	1.8	3.5	1.9	3.1	1.6	3.1	1.6
	A-15	4.5	2.6	3.5	1.9	3.5	1.9	3.1	1.6	3.1	1.6
	A-16	3.9	2.1	3.3	1.7	3.4	1.8	3.1	1.6	3.1	1.6
	A-17	4.0	2.2	3.3	1.7	3.4	1.8	3.1	1.6	3.1	1.6
	A-18	4.0	2.2	3.3	1.7	3.3	1.7	3.1	1.6	3.1	1.6
	A-19	3.9	2.1	3.4	1.8	3.3	1.7	3.2	1.6	3.1	1.6
	A-20	3.7	2.0	3.2	1.6	3.2	1.6	3.0	1.5	3.0	1.5
	A-21	3.4	1.8	3.1	1.6	3.1	1.6	3.0	1.5	3.0	1.5
	A-22	3.4	1.8	3.0	1.5	3.0	1.5	3.0	1.5	3.0	1.5
	A-23	3.3	1.7	3.0	1.5	3.0	1.5	3.0	1.5	3.0	1.5
	A-24	3.2	1.6	3.0	1.5	3.1	1.6	3.0	1.5	3.0	1.5
	A-25	3.1	1.6	3.0	1.5	3.0	1.5	3.0	1.5	3.0	1.5
	A-26	3.1	1.6	3.1	1.6	3.1	1.6	3.0	1.5	3.0	1.5
	A-27	3.4	1.8	3.1	1.6	3.1	1.6	3.0	1.5	3.0	1.5
	A-28	3.5	1.9	3.1	1.6	3.1	1.6	3.0	1.5	3.0	1.5
	A-29	3.9	2.1	3.3	1.7	3.3	1.7	3.1	1.6	3.1	1.6
	A-30	3.9	2.1	3.3	1.7	3.3	1.7	3.0	1.5	3.0	1.5
	A-31	3.9	2.1	3.3	1.7	3.3	1.7	3.0	1.5	3.0	1.5
	A-32	3.6	1.9	3.2	1.6	3.3	1.7	3.0	1.5	3.0	1.5
	A-33	3.7	2.0	3.2	1.6	3.2	1.6	3.0	1.5	3.0	1.5
	A-34	3.6	1.9	3.2	1.6	3.2	1.6	3.0	1.5	3.0	1.5
	A-35	3.6	1.9	3.1	1.6	3.1	1.6	3.0	1.5	3.0	1.5
	A-36	3.6	1.9	3.1	1.6	3.1	1.6	3.0	1.5	3.0	1.5
	A-37	3.7	2.0	3.2	1.6	3.2	1.6	3.0	1.5	3.0	1.5
	A-38	3.8	2.1	3.2	1.6	3.2	1.6	3.0	1.5	3.0	1.5
	A-39	3.9	2.1	3.2	1.6	3.2	1.6	3.0	1.5	3.0	1.5
	A-40	3.9	2.1	3.5	1.9	3.4	1.8	3.0	1.5	3.0	1.5
	A-41	4.0	2.2	3.3	1.7	3.3	1.7	3.0	1.5	3.0	1.5
	A-42	3.9	2.1	3.3	1.7	3.3	1.7	3.1	1.6	3.1	1.6

- 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 3.0 ppm.
 - 8-Hour concentrations were calculated by applying a persistence factor of 0.7 to the 1-Hour concentration, as per the PennDOT Publication 321, Project Level Air Quality Handbook, dated October 18, 2013. 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 1.5 ppm background concentration as per the PennDOT Publication 321, Section 2.4.6.
 - Highlighted cells represent highest CO concentrations per analysis year.

Pennsylvania Department of Transportation

INTERSTATE 80 RECONSTRUCTION PROJECT

AIR QUALITY TECHNICAL REPORT APPENDICES

APPENDIX A
SAMPLE MOVES2014 DATA

Existing Conditions 2013 (Free-Flow Links)

linkID	countyID	zoneID	roadTypeID	linkLength	linkVolume	linkAvgSpeed	linkDescription	linkAvgGrade
1	42089	420890	4	0.248	1917	55	I80 EB West of Rt. 611 Ramp	-3.390
2	42089	420890	4	0.374	2985	55	I80 WB West of Rt. 611 Ramp	2.947
3	42089	420890	4	1.054	1699	55	I80 EB btw Rt. 611 Ramp and Rt. 209 Ramp	-1.655
4	42089	420890	4	0.999	2893	55	I80 WB btw Rt. 611 Ramp and Rt. 209 Ramp	1.544
5	42089	420890	4	0.424	2466	55	I80 EB btw Rt. 209 and W. Main St.	0.208
6	42089	420890	4	0.086	3436	55	I80 WB btw Rt. 209 and W. Main St. Ramps	-0.521
7	42089	420890	4	0.129	2180	55	I80 EB btw W. Main St. Ramps	-0.703
8	42089	420890	4	0.667	3576	55	I80 WB btw Broad St. and Dreher Ave.	0.801
9	42089	420890	4	0.675	2272	55	I80 EB East of Park Ave. On-Ramp	0.060
10	42089	420890	4	0.266	3454	55	I80 WB East of Broad St. Off-Ramp	-1.528
11	42089	420890	4	0.135	3264	55	I80 WB btw W. Main St. Off/On Ramps	0.650
12	42089	420890	4	0.358	2376	55	I80 EB btw W. Main St. Ramp and Dreher Ave. Ramp	-0.855
13	42089	420890	4	0.716	3415	55	I80 WB btw Dreher Ave. Ramp and W. Main St. Ramp	0.885
14	42089	420890	4	0.504	2476	55	I80 EB btw Dreher Ave. Ramp and Park Ave. Ramp	-1.152
15	42089	420890	4	0.323	3157	55	I80 WB btw Broad St. On/Off Ramps	0.578
16	42089	420890	4	0.178	2132	55	I80 EB btw Park Ave. On/Off Ramps	-0.516
17	42089	420890	5	0.421	311	45	Park Ave. (Rt. 611) NB	-1.520
18	42089	420890	5	0.421	431	45	Park Ave. (Rt. 611) SB	1.518
19	42089	420890	5	0.414	622	35	Broad St. (Rt. 191) NB	-3.883
20	42089	420890	5	0.413	505	35	Broad St. (Rt. 191) SB	3.884
21	42089	420890	5	0.361	156	35	Dreher Ave. NB	-2.678
22	42089	420890	5	0.361	196	35	Dreher Ave. SB	2.677
23	42089	420890	5	0.478	490	35	W. Main St. EB	-0.633
24	42089	420890	5	0.477	750	35	W. Main St. WB	0.633
25	42089	420890	5	0.531	218	35	I80 EB to Rt. 611 (Ramp)	-0.453
26	42089	420890	5	0.459	171	35	Rt. 611 to I80 WB (Ramp)	0.477
27	42089	420890	5	0.263	767	35	Rt. 209 NB to I80 EB (Ramp)	-2.446
28	42089	420890	5	0.408	1062	45	I80 WB to Rt. 209 SB (Ramp)	1.465
29	42089	420890	5	0.289	196	35	W. Main St. to I80 EB (Ramp)	0.975
30	42089	420890	5	0.283	172	35	W. Main St. to I80 WB (Ramp)	2.001
31	42089	420890	5	0.255	250	35	I80 EB to W. Main St (Ramp)	-1.541

32	42089	420890	5	0.210	151	25	I80 WB to W. Main St (Ramp)	-2.355
33	42089	420890	5	0.208	161	25	I80 WB to Dreher Ave. (Ramp)	-1.020
34	42089	420890	5	0.189	100	35	Dreher Ave. to I80 EB (Ramp)	-1.018
35	42089	420890	5	0.215	344	35	I80 EB to Rt. 611 (Park Ave.) (Ramp)	1.804
36	42089	420890	5	0.244	140	35	Rt. 611 (Park Ave.) to I80 EB (Ramp)	-1.887
37	42089	420890	5	0.192	297	25	I80 WB to Broad St. (Ramp)	2.142
38	42089	420890	5	0.140	419	25	Broad St. to I80 WB (Ramp)	0.529

Existing Conditions 2013 (Queue Links)

linkID	countyID	zoneID	roadTypeID	linkLength	linkVolume	linkAvgSpeed	linkDescription	linkAvgGrade
1	42089	420890	5	0.042	459	25	Ann St & Broad St/5th St & Main St NBR Approach	1.102
2	42089	420890	5	0.042	459	0	Ann St & Broad St/5th St & Main St NBR Queue	1.102
3	42089	420890	5	0.033	459	25	Ann St & Broad St/5th St & Main St NBR Departure	-2.377
4	42089	420890	5	0.037	203	25	Ann St & Broad St/5th St & Main St NBL Approach	0.764
5	42089	420890	5	0.037	203	0	Ann St & Broad St/5th St & Main St NBL Queue	0.764
6	42089	420890	5	0.046	203	25	Ann St & Broad St/5th St & Main St NBL Departure	0.743
7	42089	420890	5	0.044	1050	25	Ann St & Broad St/5th St & Main St EB Departure	-0.841
8	42089	420890	5	0.049	58	25	Ann St & Broad St/5th St & Main St EBR Approach	-4.518
9	42089	420890	5	0.049	58	0	Ann St & Broad St/5th St & Main St EBR Queue	-4.518
10	42089	420890	5	0.008	58	25	Ann St & Broad St/5th St & Main St EBR Departure	-2.265
11	42089	420890	5	0.049	513	25	Ann St & Broad St/5th St & Main St EBT Approach	-4.622
12	42089	420890	5	0.049	513	0	Ann St & Broad St/5th St & Main St EBT Queue	-4.622
13	42089	420890	5	0.020	513	25	Ann St & Broad St/5th St & Main St EBT Departure	-3.461
14	42089	420890	5	0.059	505	25	Ann St & Broad St/5th St & Main St SB Departure	-0.748
15	42089	420890	5	0.033	78	25	Ann St & Broad St/5th St & Main St SBL Approach	1.753
16	42089	420890	5	0.033	78	0	Ann St & Broad St/5th St & Main St SBL Queue	1.753
17	42089	420890	5	0.007	78	25	Ann St & Broad St/5th St & Main St SBL	-0.050

18	42089	420890	5	0.033	447	25	Departure Ann St & Broad St/5th St & Main St SBT Approach	1.975
19	42089	420890	5	0.033	447	0	Ann St & Broad St/5th St & Main St SBT Queue	1.975
20	42089	420890	5	0.018	447	25	Ann St & Broad St/5th St & Main St SBT Departure	3.299
21	42089	420890	5	0.032	348	25	Ann St & Broad St/5th St & Main St SBR Approach	2.315
22	42089	420890	5	0.032	348	0	Ann St & Broad St/5th St & Main St SBR Queue	2.315
23	42089	420890	5	0.065	348	25	Ann St & Broad St/5th St & Main St SBR Departure	4.471

Design Conditions 2045 (Alt 2B Free-Flow Links)

linkID	countyID	zoneID	roadTypeID	linkLength	linkVolume	linkAvgSpeed	linkDescription	linkAvgGrade
1	42089	420890	4	0.549	3381	55	I80 EB West of Ramp A	-3.473
2	42089	420890	4	0.464	4929	55	I80 WB West of Ramp D	3.473
3	42089	420890	4	0.445	4608	55	I80 WB btw Ramp C and Ramp D	2.319
4	42089	420890	4	0.843	2652	55	I80 EB btw Ramp A	-1.499
5	42089	420890	4	0.682	4152	55	I80 WB btw Ramp H and Ramp D	1.189
6	42089	420890	4	0.265	2976	55	I80 EB btw Ramp A and Ramp J	-1.000
7	42089	420890	4	0.682	3795	55	I80 WB btw Ramp E+G and Ramp H	0.203
8	42089	420890	4	0.549	4305	55	I80 EB btw Ramp J and Ramp K	-0.417
9	42089	420890	4	0.123	6060	55	I80 WB btw Ramp N and Ramp E+G	0.221
10	42089	420890	4	0.672	4758	55	I80 EB btw Ramp K and Ramp Q	-1.158
11	42089	420890	4	0.795	6654	55	I80 WB btw Ramp R and Ramp N	1.221
12	42089	420890	4	0.701	4110	55	I80 EB btw Ramp Q and Ramp T	-0.484
13	42089	420890	4	0.398	5868	55	I80 WB btw Ramp S and Ramp R	0.409
14	42089	420890	4	0.245	4533	55	I80 EB East of Ramp T	1.602
15	42089	420890	4	0.219	6510	55	I80 WB East of Ramp S	-1.741
16	42089	420890	5	0.838	323	35	Ramp A (I-80 EB to SR 611 / US209SB)	-1.486
17	42089	420890	5	0.264	405	35	Ramp B West of 611 Connector	-2.565
18	42089	420890	5	0.719	94	35	Ramp B East of 611 Connector	-0.306
19	42089	420890	5	0.676	456	35	Ramp C East of 611 Connector (US209NB to I-80WB)	0.452
20	42089	420890	5	0.502	321	35	Ramp D West of 611 Connector (SR 611 to I-80WB)	2.910
21	42089	420890	5	1.144	269	35	Ramp E East of 611 Connector (I-80 WB to SR	0.494

22	42089	420890	5	0.150	2267	35	611)	Ramp E+G (I-80 WB before Ramp E and Ramp G)	-0.233
23	42089	420890	5	0.718	311	35		Ramp F (I-80 EB to Bus209)	-1.039
24	42089	420890	5	0.818	1998	35		Ramp G (I-80 WB to US209 SB)	0.852
25	42089	420890	5	0.404	360	35		Ramp H (Bus209 to I-80 WB)	1.077
26	42089	420890	5	0.275	1330	35		Ramp J (US 209 NB to I-80 EB)	-1.506
27	42089	420890	5	0.827	452	35		Ramp K (Bus209 to I-80 EB)	-0.160
28	42089	420890	5	0.234	177	35		Ramp L (US209NB to Bus 209)	-0.970
29	42089	420890	5	0.221	243	35		Ramp M (Bus 209 to US209SB)	0.820
30	42089	420890	5	0.386	602	35		Ramp N (I-80 WB to Bus209)	-0.847
31	42089	420890	5	0.497	647	35		Ramp Q (I-80 EB to Park Ave SR611)	-0.541
32	42089	420890	5	0.183	788	35		Ramp R (SR191 to I-80 WB)	-1.672
33	42089	420890	5	0.212	638	35		Ramp S (I-80 WB to SR191)	2.816
34	42089	420890	5	0.194	320	35		Ramp T (Park Ave SR611 to I-80 EB)	-0.663
35	42089	420890	5	0.237	850	45		Rt. 209 NB South of West Main St.	1.117
36	42089	420890	5	0.252	1171	45		Rt. 209 SB South of West Main St.	-1.610
37	42089	420890	5	0.104	704	35		Rt. 611 SB North of Ramp R	5.800
38	42089	420890	5	0.089	129	35		Rt. 611 SB South of Ramp R	2.469
39	42089	420890	5	0.043	533	35		Rt. 611 NB South of Ramp T	-1.754
40	42089	420890	5	0.150	536	35		Rt. 611 NB North of Ramp T	-5.015
41	42089	420890	5	0.821	803	35		W. Main St. WB	0.947
42	42089	420890	5	0.821	807	35		W. Main St. EB	-0.949
43	42089	420890	5	0.431	158	35		CD Road NB	-0.215
44	42089	420890	5	0.433	138	35		CD Road SB	0.212
45	42089	420890	5	0.344	289	35		Dreher St. SB	2.677
46	42089	420890	5	0.344	168	35		Dreher St. NB	-2.678
47	42089	420890	5	0.244	593	35		611 Connector	-2.240
48	42089	420890	5	0.261	561	35		611 Connector	2.310
49	42089	420890	5	0.330	986	35		PA 611 WB	1.880
50	42089	420890	5	0.333	849	35		PA 611 EB	-1.850

Design Conditions 2045 (Alt 2B Queue Links)

linkID	countyID	zoneID	roadTypeID	linkLength	linkVolume	linkAvgSpeed	linkDescription	linkAvgGrade
1	42089	420890	5	0.042	655	25	Ann St & Broad St/5th St & Main St NBR Approach	1.102
2	42089	420890	5	0.042	655	0	Ann St & Broad St/5th St & Main St NBR Queue	1.102

3	42089	420890	5	0.033	655	25	Ann St & Broad St/5th St & Main St NBR Departure	-2.377
4	42089	420890	5	0.037	290	25	Ann St & Broad St/5th St & Main St NBL Approach	0.764
5	42089	420890	5	0.037	290	0	Ann St & Broad St/5th St & Main St NBL Queue	0.764
6	42089	420890	5	0.046	290	25	Ann St & Broad St/5th St & Main St NBL Departure	0.743
7	42089	420890	5	0.044	1303	25	Ann St & Broad St/5th St & Main St EB Departure	-0.841
8	42089	420890	5	0.049	74	25	Ann St & Broad St/5th St & Main St EBR Approach	-4.518
9	42089	420890	5	0.049	74	0	Ann St & Broad St/5th St & Main St EBR Queue	-4.518
10	42089	420890	5	0.008	74	25	Ann St & Broad St/5th St & Main St EBR Departure	-2.265
11	42089	420890	5	0.049	570	25	Ann St & Broad St/5th St & Main St EBT Approach	-4.622
12	42089	420890	5	0.049	570	0	Ann St & Broad St/5th St & Main St EBT Queue	-4.622
13	42089	420890	5	0.020	570	25	Ann St & Broad St/5th St & Main St EBT Departure	-3.461
14	42089	420890	5	0.059	644	25	Ann St & Broad St/5th St & Main St SB Departure	-0.748
15	42089	420890	5	0.033	78	25	Ann St & Broad St/5th St & Main St SBL Approach	1.753
16	42089	420890	5	0.033	78	0	Ann St & Broad St/5th St & Main St SBL Queue	1.753
17	42089	420890	5	0.007	78	25	Ann St & Broad St/5th St & Main St SBL Departure	-0.050
18	42089	420890	5	0.033	570	25	Ann St & Broad St/5th St & Main St SBT Approach	1.975
19	42089	420890	5	0.033	570	0	Ann St & Broad St/5th St & Main St SBT Queue	1.975
20	42089	420890	5	0.018	570	25	Ann St & Broad St/5th St & Main St SBT Departure	3.299
21	42089	420890	5	0.032	348	25	Ann St & Broad St/5th St & Main St SBR Approach	2.315
22	42089	420890	5	0.032	348	0	Ann St & Broad St/5th St & Main St SBR Queue	2.315
23	42089	420890	5	0.065	348	25	Ann St & Broad St/5th St & Main St SBR Departure	4.471

APPENDIX B

SAMPLE CAL3QHC INPUT / OUTPUT FILES

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

Run Began on 4/15/2015 at 12:50:07

JOB: I-80 -CO STUDY- EXISTING CONDITIONS 2013
POINTS INTERSECTION

RUN: 5-

DATE : 04/15/ 0
TIME : 12:50:07

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 = 0. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES
MIXH = 1000. M AMB = 0.0 PPM

LINK VARIABLES

LINK DESCRIPTION				LINK COORDINATES (M)					
LENGTH	BRG	TYPE	VPH	EF	H	W	V/C	QUEUE	
(M)	(DEG)		(G/MI)		X1		Y1	X2	
					(M)	(M)	(VEH)	Y2	
1.	NBR	APPROACH			815365.6		94101.8	815358.5	94168.6
67.	354.	AG	459.	8.7	0.0	9.4			
2.	NBL	APPROACH			815364.0		94100.4	815357.3	94159.6
60.	354.	AG	203.	8.3	0.0	9.1			
3.	NBL	DEPARTURE			815357.2		94160.1	815349.9	94168.0
11.	317.	AG	203.	8.3	0.0	9.1			
4.	NBL	DEPARTURE			815349.9		94168.0	815335.5	94160.6
16.	243.	AG	203.	8.3	0.0	9.1			
5.	NBL	DEPARTURE			815335.5		94160.6	815308.9	94121.2
48.	214.	AG	203.	8.3	0.0	9.1			
6.	SB	DEPARTURE			815351.5		94195.1	815360.1	94099.3
96.	175.	AG	505.	6.9	0.0	9.8			
7.	NBR	DEPARTURE			815358.4		94168.5	815357.0	94190.4
22.	356.	AG	459.	5.9	0.0	9.4			
8.	NBR	DEPARTURE			815357.0		94190.4	815366.8	94219.7
31.	19.	AG	459.	5.9	0.0	9.4			
9.	EB	DEPARTURE			815367.1		94219.5	815399.1	94284.7
73.	26.	AG	1050.	6.8	0.0	13.4			
10.	SBL	APPROACH			815328.6		94269.8	815357.4	94224.9
53.	147.	AG	78.	9.3	0.0	9.1			
11.	SBL	DEPARTURE			815357.2		94225.1	815365.7	94219.9
10.	121.	AG	78.	7.5	0.0	9.1			
12.	SBT	APPROACH			815325.9		94267.9	815354.5	94222.0
54.	148.	AG	447.	9.5	0.0	9.1			

27.	13.	SBT DEPARTURE	*	815354.5	94222.0	815352.2	94195.2	*
	185.	AG 447. 11.1	0.0	9.1				
	14.	SBR APPROACH	*	815323.5	94265.7	815350.0	94221.3	*
52.	149.	AG 348. 9.8	0.0	9.4				
	15.	SBR DEPARTURE	*	815350.1	94221.4	815351.4	94209.4	*
12.	174.	AG 348. 13.4	0.0	9.4				
	16.	SBR DEPARTURE	*	815351.4	94209.4	815333.6	94201.9	*
19.	247.	AG 348. 13.4	0.0	9.4				
	17.	SBR DEPARTURE	*	815333.6	94201.9	815264.0	94176.9	*
74.	250.	AG 348. 13.4	0.0	9.4				
	18.	EBT APPROACH	*	815264.8	94173.6	815339.7	94201.0	*
80.	70.	AG 513. 4.7	0.0	9.4				
	19.	EBT DEPARTURE	*	815339.1	94200.9	815357.2	94210.1	*
20.	63.	AG 513. 4.7	0.0	9.4				
	20.	EBT DEPARTURE	*	815357.2	94210.1	815365.9	94217.5	*
11.	50.	AG 513. 4.7	0.0	9.4				
	21.	EBR APPROACH	*	815265.6	94170.6	815340.3	94197.6	*
79.	70.	AG 58. 4.8	0.0	9.4				
	22.	EBR DEPARTURE	*	815340.5	94197.6	815351.3	94195.4	*
11.	102.	AG 58. 5.9	0.0	9.4				
	23.	NBR QUEUE	*	815358.5	94168.2	815364.4	94112.7	*
56.	174.	AG 62. 100.0	0.0	3.3 0.59	9.3			
	24.	NBL QUEUE	*	815357.2	94159.6	815359.6	94138.4	*
21.	174.	AG 53. 100.0	0.0	3.0 0.23	3.6			
	25.	SBL QUEUE	*	815357.1	94225.4	815351.8	94233.7	*
10.	327.	AG 64. 100.0	0.0	3.0 0.11	1.6			
	26.	SBT QUEUE	*	815354.2	94222.4	815321.0	94275.4	*
63.	328.	AG 71. 100.0	0.0	3.0 0.68	10.4			
	27.	SBR QUEUE	*	815349.8	94221.8	815335.5	94245.7	*
28.	329.	AG 40. 100.0	0.0	3.0 0.33	4.6			
	28.	EBT QUEUE	*	815338.8	94200.8	814769.9	93992.3	*
606.	250.	AG 94. 100.0	0.0	3.3 1.46	101.0			
	29.	EBR QUEUE	*	815340.1	94197.5	815329.9	94193.8	*
11.	250.	AG 94. 100.0	0.0	3.3 0.16	1.8			

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JOB: I-80 -CO STUDY- EXISTING CONDITIONS 2013
POINTS INTERSECTION

RUN: 5-

DATE : 04/15/ 0
TIME : 12:50:07

ADDITIONAL QUEUE LINK PARAMETERS

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

1600	23.	NBR QUEUE	*	150	73	2.5	459
		47.14	2	3			

	24.	NBL QUEUE	*	150	63	2.5	203
1600		47.14	2	3			
	25.	SBL QUEUE	*	150	76	2.5	78
1600		47.14	2	3			
	26.	SBT QUEUE	*	150	84	2.5	447
1600		47.14	2	3			
	27.	SBR QUEUE	*	150	48	2.5	348
1600		47.14	2	3			
	28.	EBT QUEUE	*	150	112	3.0	513
1600		47.14	2	3			
	29.	EBR QUEUE	*	150	112	3.0	58
1600		47.14	2	3			

RECEPTOR LOCATIONS

		*	COORDINATES (M)			*
RECEPTOR		*	X	Y	Z	*
-----		*	-----	-----	-----	*
1.	A1	*	815308.0	94286.2	1.8	*
2.	A2	*	815332.6	94280.9	1.8	*
3.	A3	*	815356.5	94243.4	1.8	*
4.	A4	*	815360.6	94227.5	1.8	*
5.	A5	*	815373.5	94252.7	1.8	*
6.	A6	*	815384.0	94273.8	1.8	*
7.	A7	*	815393.2	94292.2	1.8	*
8.	A8	*	815411.6	94291.6	1.8	*
9.	A9	*	815397.3	94262.4	1.8	*
10.	A10	*	815385.9	94235.0	1.8	*
11.	A11	*	815374.3	94209.5	1.8	*
12.	A12	*	815361.0	94186.1	1.8	*
13.	A13	*	815363.5	94155.8	1.8	*
14.	A14	*	815365.8	94130.2	1.8	*
15.	A15	*	815367.4	94104.5	1.8	*
16.	A16	*	815357.9	94104.5	1.8	*
17.	A17	*	815356.1	94122.6	1.8	*
18.	A18	*	815355.0	94137.7	1.8	*
19.	A19	*	815353.6	94152.7	1.8	*
20.	A20	*	815347.0	94158.4	1.8	*
21.	A21	*	815338.7	94152.0	1.8	*
22.	A22	*	815330.8	94141.4	1.8	*
23.	A23	*	815323.0	94128.0	1.8	*
24.	A24	*	815312.1	94113.8	1.8	*
25.	A25	*	815295.8	94110.4	1.8	*
26.	A26	*	815307.6	94129.5	1.8	*
27.	A27	*	815319.9	94145.9	1.8	*
28.	A28	*	815335.4	94167.0	1.8	*
29.	A29	*	815347.3	94183.5	1.8	*
30.	A30	*	815343.6	94193.5	1.8	*
31.	A31	*	815321.7	94185.9	1.8	*
32.	A32	*	815299.0	94176.9	1.8	*
33.	A33	*	815275.1	94167.7	1.8	*
34.	A34	*	815246.8	94157.0	1.8	*
35.	A35	*	815235.0	94175.9	1.8	*
36.	A36	*	815258.2	94184.6	1.8	*


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37. A37          *      815280.6    94190.4        1.8  *
38. A38          *      815303.4    94197.6        1.8  *

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JOB: I-80 -CO STUDY- EXISTING CONDITIONS 2013 RUN: 5-
POINTS INTERSECTION

DATE : 04/15/ 0
TIME : 12:50:07

RECEPTOR LOCATIONS

```

-----
RECEPTOR          *      COORDINATES (M)          *
                   *      X            Y            Z            *
-----*-----*-----*-----*
39. A39            *      815327.4    94207.1        1.8  *
40. A40            *      815346.2    94216.9        1.8  *
41. A41            *      815335.0    94239.7        1.8  *
42. A42            *      815322.3    94261.3        1.8  *

```

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JOB: I-80 -CO STUDY- EXISTING CONDITIONS 2013 RUN: 5-
POINTS INTERSECTION

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 REC19 REC20
-----*-----*-----*-----*-----*
0. * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.3 0.3 0.3
0.2 0.2 0.3 0.6 0.9 0.9 0.7 0.6 0.4
10. * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.2 0.3 0.3
0.4 0.3 0.2 0.2 0.8 1.0 1.0 0.6 0.2
20. * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.1 0.1 0.2
0.3 0.0 0.0 0.1 0.7 0.7 1.0 0.5 0.6
30. * 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 0.0 0.0 0.5 0.6 0.8 0.7 0.2
40. * 0.0 0.0 0.0 0.4 0.3 0.1 0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.4 0.5 0.7 0.7 0.2
50. * 0.0 0.0 0.2 0.4 0.3 0.2 0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.3 0.4 0.6 0.6 0.3

```

60.	*	0.0	0.0	0.2	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.3	0.4	0.6	0.7	0.3				
70.	*	0.0	0.0	0.2	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.3	0.4	0.5	0.5	0.3				
80.	*	0.0	0.0	0.1	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.3	0.4	0.5	0.5	0.3				
90.	*	0.0	0.1	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.3	0.4	0.4	0.5	0.4				
100.	*	0.1	0.1	0.1	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.3	0.4	0.4	0.5	0.4				
110.	*	0.1	0.1	0.1	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.2	0.4	0.4	0.7	0.4				
120.	*	0.1	0.1	0.1	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.1	0.4	0.4	0.6	0.4				
130.	*	0.4	0.1	0.1	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.1	0.6	0.6	0.8	0.4				
140.	*	0.6	0.1	0.1	0.1	0.2	0.2	0.1	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.1	0.5	0.6	0.8	0.5				
150.	*	0.3	0.0	0.1	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.1	0.5	0.7	0.9	0.7				
160.	*	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.0	0.0	0.0	0.0
0.0	0.1	0.1	0.0	0.1	0.4	0.6	0.9	0.5				
170.	*	0.1	0.7	0.1	0.2	0.3	0.3	0.2	0.0	0.0	0.0	0.0
0.2	0.2	0.2	0.0	0.1	0.2	0.5	0.6	0.1				
180.	*	0.1	0.4	0.5	0.5	0.3	0.3	0.3	0.0	0.0	0.0	0.0
0.9	0.9	0.5	0.0	0.1	0.2	0.3	0.3	0.0				
190.	*	0.1	0.4	0.5	0.4	0.7	0.5	0.4	0.0	0.0	0.1	0.3
0.6	1.1	0.8	0.0	0.1	0.1	0.1	0.1	0.0				
200.	*	0.1	0.4	0.6	0.3	0.2	0.2	0.3	0.0	0.0	0.2	0.3
0.4	1.0	0.7	0.1	0.1	0.1	0.1	0.1	0.0				
210.	*	0.1	0.2	0.5	0.5	0.2	0.0	0.0	0.3	0.2	0.0	0.2
0.2	0.8	0.7	0.1	0.0	0.0	0.1	0.0	0.0				
220.	*	0.1	0.2	0.6	0.5	0.5	0.2	0.1	0.5	0.5	0.2	0.2
0.3	0.8	0.6	0.1	0.1	0.0	0.0	0.0	0.0				
230.	*	0.1	0.2	0.7	0.9	0.4	0.2	0.1	0.3	0.6	0.4	0.2
0.2	0.7	0.5	0.2	0.0	0.0	0.0	0.0	0.1				
240.	*	0.1	0.2	0.6	0.9	0.4	0.2	0.1	0.2	0.6	1.1	0.2
0.2	0.6	0.5	0.3	0.0	0.0	0.0	0.0	0.1				
250.	*	0.0	0.0	0.5	0.8	0.3	0.1	0.0	0.1	0.5	0.5	1.0
0.3	0.6	0.5	0.3	0.0	0.0	0.0	0.0	0.1				
260.	*	0.0	0.0	0.4	0.6	0.2	0.1	0.0	0.0	0.3	0.5	0.8
0.5	0.7	0.6	0.4	0.1	0.1	0.1	0.1	0.2				
270.	*	0.0	0.0	0.4	0.6	0.2	0.0	0.0	0.0	0.3	0.4	0.4
0.6	0.7	0.6	0.4	0.1	0.1	0.1	0.1	0.1				
280.	*	0.0	0.0	0.3	0.7	0.2	0.0	0.0	0.0	0.2	0.4	0.4
0.6	0.7	0.6	0.4	0.1	0.1	0.1	0.1	0.1				
290.	*	0.0	0.0	0.3	0.8	0.1	0.0	0.0	0.0	0.2	0.4	0.4
0.5	0.7	0.6	0.4	0.1	0.1	0.1	0.1	0.2				
300.	*	0.0	0.0	0.4	0.8	0.0	0.0	0.0	0.0	0.2	0.3	0.7
0.4	0.8	0.6	0.4	0.1	0.1	0.1	0.2	0.3				
310.	*	0.0	0.0	0.2	0.8	0.0	0.0	0.0	0.0	0.2	0.2	0.7
0.3	0.6	0.7	0.5	0.1	0.1	0.1	0.1	0.3				
320.	*	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.2	0.2	0.7
0.5	0.7	0.9	0.5	0.1	0.1	0.2	0.2	0.2				

330.	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.1
0.4	0.7	1.1	0.6	0.2	0.2	0.2	0.2	0.3				
340.	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
1.0	0.7	1.2	0.9	0.2	0.2	0.3	0.4	0.2				
350.	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.2
0.5	0.6	1.0	1.5	0.4	0.4	0.5	0.6	0.2				
-----*												
MAX	*	0.6	0.7	0.7	0.9	0.7	0.5	0.4	0.5	0.6	1.1	1.0
1.0	1.1	1.2	1.5	0.9	1.0	1.0	0.9	0.7				
DEGR.	*	140	170	230	230	190	190	190	220	230	240	250
340	190	340	350	0	10	20	150	150				

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JOB: I-80 -CO STUDY- EXISTING CONDITIONS 2013
POINTS INTERSECTION

RUN: 5-

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)* REC21 REC22 REC23 REC24 REC25 REC26 REC27 REC28 REC29 REC30 REC31
REC32 REC33 REC34 REC35 REC36 REC37 REC38 REC39 REC40
-----*

0.	*	0.3	0.3	0.2	0.2	0.1	0.1	0.2	0.5	0.7	0.6	0.4
0.4	0.4	0.2	0.0	0.0	0.0	0.0	0.2	0.8				
10.	*	0.2	0.1	0.2	0.2	0.1	0.1	0.2	0.2	0.4	0.5	0.5
0.4	0.4	0.2	0.0	0.0	0.0	0.0	0.3	0.6				
20.	*	0.4	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.4	0.5	0.5
0.4	0.4	0.2	0.0	0.0	0.0	0.1	0.3	0.7				
30.	*	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.5	0.6	0.5
0.4	0.4	0.2	0.0	0.0	0.0	0.1	0.3	0.6				
40.	*	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.5	0.8
0.5	0.5	0.4	0.0	0.0	0.0	0.0	0.4	0.7				
50.	*	0.1	0.3	0.3	0.1	0.1	0.1	0.2	0.1	0.2	0.3	0.9
0.6	0.7	0.5	0.0	0.0	0.0	0.2	0.4	0.7				
60.	*	0.3	0.3	0.2	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3
0.6	0.6	0.6	0.1	0.1	0.1	0.1	0.2	0.5				
70.	*	0.3	0.4	0.1	0.0	0.0	0.1	0.2	0.1	0.2	0.2	0.0
0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.3	0.4				
80.	*	0.4	0.4	0.1	0.0	0.0	0.1	0.2	0.2	0.2	0.3	0.0
0.0	0.0	0.0	0.6	0.5	0.5	0.5	0.3	0.4				
90.	*	0.4	0.3	0.1	0.0	0.0	0.1	0.2	0.4	0.2	0.2	0.0
0.0	0.0	0.0	0.5	0.6	0.7	0.8	0.4	0.3				

100.	*	0.4	0.3	0.1	0.0	0.0	0.1	0.2	0.4	0.2	0.1	0.1
0.0	0.0	0.0	0.2	0.5	0.5	0.7	0.4	0.4				
110.	*	0.4	0.3	0.1	0.0	0.0	0.1	0.3	0.4	0.2	0.2	0.0
0.0	0.0	0.0	0.2	0.5	0.5	0.5	0.2	0.5				
120.	*	0.4	0.3	0.0	0.0	0.0	0.1	0.4	0.5	0.2	0.2	0.1
0.1	0.0	0.0	0.2	0.4	0.5	0.5	0.4	0.4				
130.	*	0.3	0.2	0.0	0.0	0.0	0.1	0.1	0.5	0.2	0.2	0.3
0.0	0.0	0.0	0.2	0.4	0.5	0.6	0.7	0.6				
140.	*	0.3	0.1	0.0	0.0	0.0	0.1	0.1	0.4	0.4	0.2	0.3
0.0	0.0	0.0	0.1	0.3	0.4	0.5	0.7	0.6				
150.	*	0.2	0.0	0.0	0.0	0.0	0.1	0.1	0.4	0.5	0.4	0.2
0.0	0.0	0.0	0.2	0.2	0.4	0.4	0.9	0.6				
160.	*	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.9	0.6	0.0
0.0	0.0	0.0	0.2	0.2	0.4	0.5	0.7	0.7				
170.	*	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.6	0.2	0.0
0.0	0.0	0.0	0.2	0.2	0.4	0.4	0.5	0.9				
180.	*	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	0.2	0.2	0.4	0.4	0.4	0.4				
190.	*	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	0.2	0.2	0.4	0.5	0.5	0.2				
200.	*	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0
0.0	0.0	0.0	0.2	0.2	0.5	0.5	0.5	0.4				
210.	*	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	0.2	0.2	0.5	0.5	0.5	0.5				
220.	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.2	0.2	0.5	0.6	0.5	0.5				
230.	*	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	0.3	0.3	0.5	0.7	0.7	0.6				
240.	*	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	0.4	0.5	0.8	0.8	0.7				
250.	*	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.3
0.3	0.3	0.3	0.2	0.2	0.3	0.4	0.4	0.2				
260.	*	0.3	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.3	0.7	0.7
0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0				
270.	*	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.4	0.8	0.6
0.5	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0				
280.	*	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.9	0.6
0.5	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0				
290.	*	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.7	0.4
0.4	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0				
300.	*	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.7	0.4
0.4	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0				
310.	*	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.7	0.4
0.4	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0				
320.	*	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.5	0.4
0.4	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0				
330.	*	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.4
0.4	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.1				
340.	*	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.4
0.4	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.7				
350.	*	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.4	0.5	0.4
0.4	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.9				

 *

MAX	*	0.4	0.4	0.3	0.2	0.1	0.1	0.4	0.5	0.9	0.9	0.9
0.6	0.7	0.6	0.6	0.6	0.7	0.8	0.9	0.9				
DEGR.	*	20	70	20	0	0	0	120	130	160	280	50
50	50	60	80	90	90	90	150	170				

PAGE 6

JOB: I-80 -CO STUDY- EXISTING CONDITIONS 2013
POINTS INTERSECTION

RUN: 5-

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)* REC41 REC42

ANGLE (DEGR)	REC41 (PPM)	REC42 (PPM)
0.	0.7	0.3
10.	0.7	0.3
20.	0.5	0.4
30.	0.5	0.4
40.	0.5	0.4
50.	0.5	0.4
60.	0.6	0.4
70.	0.6	0.4
80.	0.6	0.5
90.	0.6	0.5
100.	0.7	0.6
110.	1.0	0.7
120.	1.0	0.7
130.	0.8	0.9
140.	0.7	0.8
150.	0.4	0.5
160.	0.5	0.4
170.	0.2	0.1
180.	0.2	0.1
190.	0.2	0.1
200.	0.2	0.2
210.	0.2	0.1
220.	0.2	0.1
230.	0.1	0.1
240.	0.2	0.1
250.	0.0	0.0
260.	0.0	0.0
270.	0.0	0.0
280.	0.0	0.0
290.	0.0	0.0

```

300. * 0.0 0.0
310. * 0.0 0.0
320. * 0.1 0.0
330. * 0.2 0.0
340. * 0.5 0.0
350. * 0.6 0.2
-----*-----
MAX * 1.0 0.9
DEGR. * 120 130

```

THE HIGHEST CONCENTRATION OF 1.50 PPM OCCURRED AT RECEPTOR REC15.

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JOB: I-80 -CO STUDY- EXISTING CONDITIONS 2013
POINTS INTERSECTION

RUN: 5-

DATE : 04/15/ 0
TIME : 12:50:07

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 REC19 REC20
LINK # * 140 170 230 230 190 190 190 220 230 240
250 340 190 340 350 0 10 20 150 150
-----*-----

```

```

-----*-----
1 * 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 0.3 0.3 0.4 0.2 0.2 0.2 0.2 0.1
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 0.1 0.1 0.2 0.1 0.1 0.1 0.1 0.1
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 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 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 0.0 0.0 0.0
6 * 0.0 0.1 0.0 0.0 0.1 0.0 0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.2 0.2 0.2 0.4 0.2 0.2 0.2 0.2
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 0.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
8 * 0.0 0.0 0.0 0.0 0.1 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 0.0
9 * 0.0 0.0 0.0 0.0 0.3 0.4 0.4 0.4 0.4 0.4 0.3
0.0 0.0 0.0 0.0 0.0 0.0 0.1 0.1 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 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 0.0 0.0 0.0 0.0

```

0.0	12	*	0.2	0.1	0.1	0.1	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	0.0
0.1	13	*	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1
0.1	0.2		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	14	*	0.1	0.1	0.1	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	0.0
0.0	15	*	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1
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	16	*	0.0	0.0	0.0	0.1	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	0.0
0.1	17	*	0.0	0.0	0.1	0.1	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	0.0	0.0
0.1	18	*	0.0	0.0	0.0	0.1	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	0.0	0.0	0.0	0.0
0.0	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	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	0.0	0.0	0.0	0.0
0.0	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	0.0	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	0.0	0.0	0.0	0.0
0.0	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	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
0.0	0.0		0.4	0.4	0.5	0.1	0.2	0.2	0.2	0.2	0.2	0.2
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		0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1
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	0.0	0.0	0.0	0.0	0.0
0.0	26	*	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.2		0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	27	*	0.0	0.1	0.1	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	0.0
0.5	28	*	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.1	0.1	0.3
0.5	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.1	29	*	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	0.0	0.0	0.0	0.0	0.0

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JOB: I-80 -CO STUDY- EXISTING CONDITIONS 2013
POINTS INTERSECTION

RUN: 5-

DATE : 04/15/ 0
TIME : 12:50:07

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

			* CO/LINK (PPM)									
			* ANGLE (DEGREES)									
			REC21	REC22	REC23	REC24	REC25	REC26	REC27	REC28	REC29	REC30
REC31	REC32	REC33	REC34	REC35	REC36	REC37	REC38	REC39	REC40			
	LINK #	*	20	70	20	0	0	0	120	130	160	280
50	50	50	60	80	90	90	90	150	170			

	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	0.0	0.0	0.0	0.0
	28	*	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.3
0.1	0.3		0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.0	0.0	0.3
	29	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
0.3	0.0		0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.3

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JOB: I-80 -CO STUDY- EXISTING CONDITIONS 2013
POINTS INTERSECTION

RUN: 5-

DATE : 04/15/ 0
TIME : 12:50:07

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

	*	CO/LINK (PPM)	
	*	ANGLE (DEGREES)	
	*	REC41	REC42
LINK #	*	120	130
	*	-----	
1	*	0.0	0.0
2	*	0.0	0.0
3	*	0.0	0.0
4	*	0.0	0.0
5	*	0.0	0.0
6	*	0.0	0.0
7	*	0.0	0.0
8	*	0.0	0.0
9	*	0.1	0.1
10	*	0.0	0.0
11	*	0.0	0.0
12	*	0.2	0.3
13	*	0.0	0.0
14	*	0.2	0.2
15	*	0.0	0.0
16	*	0.0	0.0
17	*	0.0	0.0
18	*	0.0	0.0
19	*	0.0	0.0
20	*	0.0	0.0
21	*	0.0	0.0
22	*	0.0	0.0
23	*	0.0	0.0
24	*	0.0	0.0
25	*	0.1	0.0
26	*	0.2	0.3
27	*	0.2	0.0
28	*	0.0	0.0
29	*	0.0	0.0

1

CAL3QHC - (DATED 95221)

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

Run Began on 3/12/2015 at 12:50:19

JOB: I-80 - CO STUDY - ALTB 2045
HIGHEST INTERSECTION (ANN/BROAD/5TH/MAIN)

RUN:

DATE : 03/12/ 0
TIME : 12:50:19

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 = 0. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES
MIXH = 1000. M AMB = 0.0 PPM

LINK VARIABLES

LINK DESCRIPTION				LINK COORDINATES (M)						
LENGTH	BRG	TYPE	VPH	EF	H	W	V/C	QUEUE		
(M)	(DEG)		(G/MI)		X1		Y1	X2	Y2	
					(M)	(M)	(VEH)			
67.	1.	NBR APPROACH			* 815365.6		94101.8	815358.5	94168.6	*
	354.	AG	655.	1.4	0.0	9.8				
60.	2.	NBL APPROACH			* 815364.0		94100.4	815357.3	94159.6	*
	354.	AG	290.	1.3	0.0	9.8				
11.	3.	NBL DEPARTURE			* 815357.2		94160.1	815349.9	94168.0	*
	317.	AG	290.	1.3	0.0	9.8				
16.	4.	NBL DEPARTURE			* 815349.9		94168.0	815335.5	94160.6	*
	243.	AG	290.	1.3	0.0	9.8				
48.	5.	NBL DEPARTURE			* 815335.5		94160.6	815308.9	94121.2	*
	214.	AG	290.	1.3	0.0	9.8				
96.	6.	SB DEPARTURE			* 815351.5		94195.1	815360.1	94099.3	*
	175.	AG	644.	1.0	0.0	9.8				
22.	7.	NBR DEPARTURE			* 815358.4		94168.5	815357.0	94190.4	*
	356.	AG	655.	0.9	0.0	9.8				
31.	8.	NBR DEPARTURE			* 815357.0		94190.4	815366.8	94219.7	*
	19.	AG	655.	0.9	0.0	9.8				
73.	9.	EB DEPARTURE			* 815367.1		94219.5	815399.1	94284.7	*
	26.	AG	1303.	1.0	0.0	13.4				
53.	10.	SBL APPROACH			* 815328.6		94269.8	815357.4	94224.9	*
	147.	AG	78.	1.5	0.0	9.1				
10.	11.	SBL DEPARTURE			* 815357.2		94225.1	815365.7	94219.9	*
	121.	AG	78.	1.1	0.0	9.1				

	12.	SBT APPROACH		*	815325.9	94267.9	815354.5	94222.0	*
54.	148.	AG 570.	1.5	0.0	9.1				
	13.	SBT DEPARTURE		*	815354.5	94222.0	815352.2	94195.2	*
27.	185.	AG 570.	1.8	0.0	9.1				
	14.	SBR APPROACH		*	815323.5	94265.7	815350.0	94221.3	*
52.	149.	AG 348.	1.6	0.0	9.4				
	15.	SBR DEPARTURE		*	815350.1	94221.4	815351.4	94209.4	*
12.	174.	AG 348.	2.3	0.0	9.4				
	16.	SBR DEPARTURE		*	815351.4	94209.4	815333.6	94201.9	*
19.	247.	AG 348.	2.3	0.0	9.4				
	17.	SBR DEPARTURE		*	815333.6	94201.9	815264.0	94176.9	*
74.	250.	AG 348.	2.3	0.0	9.4				
	18.	EBT APPROACH		*	815264.8	94173.6	815339.7	94201.0	*
80.	70.	AG 570.	0.7	0.0	9.4				
	19.	EBT DEPARTURE		*	815339.1	94200.9	815357.2	94210.1	*
20.	63.	AG 570.	0.8	0.0	9.4				
	20.	EBT DEPARTURE		*	815357.2	94210.1	815365.9	94217.5	*
11.	50.	AG 570.	0.8	0.0	9.4				
	21.	EBR APPROACH		*	815265.6	94170.6	815340.3	94197.6	*
79.	70.	AG 74.	0.7	0.0	9.4				
	22.	EBR DEPARTURE		*	815340.5	94197.6	815351.3	94195.4	*
11.	102.	AG 74.	0.9	0.0	9.4				
	23.	NBR QUEUE		*	815358.5	94168.2	815366.6	94092.2	*
76.	174.	AG 5.	100.0	0.0	3.3 0.81	12.7			
	24.	NBL QUEUE		*	815357.2	94159.6	815360.4	94130.8	*
29.	174.	AG 4.	100.0	0.0	3.0 0.32	4.8			
	25.	SBL QUEUE		*	815357.1	94225.4	815351.3	94234.5	*
11.	327.	AG 6.	100.0	0.0	3.0 0.12	1.8			
	26.	SBT QUEUE		*	815354.2	94222.4	815301.4	94306.6	*
99.	328.	AG 6.	100.0	0.0	3.0 0.96	16.6			
	27.	SBR QUEUE		*	815349.8	94221.8	815332.8	94250.2	*
33.	329.	AG 4.	100.0	0.0	3.0 0.37	5.5			
	28.	EBT QUEUE		*	815338.8	94200.8	814548.9	93911.4	*
841.	250.	AG 8.	100.0	0.0	3.3 1.70	140.2			
	29.	EBR QUEUE		*	815340.1	94197.5	815326.6	94192.6	*
14.	250.	AG 8.	100.0	0.0	3.3 0.24	2.4			

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JOB: I-80 - CO STUDY - ALTB 2045
 HIGHEST INTERSECTION (ANN/BROAD/5TH/MAIN)

RUN:

DATE : 03/12/ 0
 TIME : 12:50:19

ADDITIONAL QUEUE LINK PARAMETERS

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

*

1600	23. NBR QUEUE		*	150	70	2.5	655
	3.90	2	3				
1600	24. NBL QUEUE		*	150	60	2.0	290
	3.90	2	3				
1600	25. SBL QUEUE		*	150	83	2.5	78
	3.90	2	3				
1600	26. SBT QUEUE		*	150	90	2.5	570
	3.90	2	3				
1600	27. SBR QUEUE		*	150	57	2.5	348
	3.90	2	3				
1600	28. EBT QUEUE		*	150	114	2.5	570
	3.90	2	3				
1600	29. EBR QUEUE		*	150	117	2.5	74
	3.90	2	3				

RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M)			*
	*	X	Y	Z	*
1. A1	*	815308.0	94286.2	1.8	*
2. A2	*	815332.6	94280.9	1.8	*
3. A3	*	815356.5	94243.4	1.8	*
4. A4	*	815360.6	94227.5	1.8	*
5. A5	*	815373.5	94252.7	1.8	*
6. A6	*	815384.0	94273.8	1.8	*
7. A7	*	815393.2	94292.2	1.8	*
8. A8	*	815411.6	94291.6	1.8	*
9. A9	*	815397.3	94262.4	1.8	*
10. A10	*	815385.9	94235.0	1.8	*
11. A11	*	815374.3	94209.5	1.8	*
12. A12	*	815361.0	94186.1	1.8	*
13. A13	*	815363.5	94155.8	1.8	*
14. A14	*	815365.8	94130.2	1.8	*
15. A15	*	815367.4	94104.5	1.8	*
16. A16	*	815357.9	94104.5	1.8	*
17. A17	*	815356.1	94122.6	1.8	*
18. A18	*	815355.0	94137.7	1.8	*
19. A19	*	815353.6	94152.7	1.8	*
20. A20	*	815347.0	94158.4	1.8	*
21. A21	*	815338.7	94152.0	1.8	*
22. A22	*	815330.8	94141.4	1.8	*
23. A23	*	815323.0	94128.0	1.8	*
24. A24	*	815312.1	94113.8	1.8	*
25. A25	*	815295.8	94110.4	1.8	*
26. A26	*	815307.6	94129.5	1.8	*
27. A27	*	815319.9	94145.9	1.8	*
28. A28	*	815335.4	94167.0	1.8	*
29. A29	*	815347.3	94183.5	1.8	*
30. A30	*	815343.6	94193.5	1.8	*
31. A31	*	815321.7	94185.9	1.8	*
32. A32	*	815299.0	94176.9	1.8	*
33. A33	*	815275.1	94167.7	1.8	*
34. A34	*	815246.8	94157.0	1.8	*

35. A35	*	815235.0	94175.9	1.8	*
36. A36	*	815258.2	94184.6	1.8	*
37. A37	*	815280.6	94190.4	1.8	*
38. A38	*	815303.4	94197.6	1.8	*

PAGE 3

JOB: I-80 - CO STUDY - ALTB 2045
 HIGHEST INTERSECTION (ANN/BROAD/5TH/MAIN)

RUN:

DATE : 03/12/ 0
 TIME : 12:50:19

RECEPTOR LOCATIONS

RECEPTOR	*	X	Y	Z	*
39. A39	*	815327.4	94207.1	1.8	*
40. A40	*	815346.2	94216.9	1.8	*
41. A41	*	815335.0	94239.7	1.8	*
42. A42	*	815322.3	94261.3	1.8	*

PAGE 4

JOB: I-80 - CO STUDY - ALTB 2045
 HIGHEST INTERSECTION (ANN/BROAD/5TH/MAIN)

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 REC19 REC20

0.	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0					
10.	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0					
20.	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0					
40.	*	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0					


```

-----*-----
MAX * 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 0.0 0.0 0.0 0.0 0.0 0.0
DEGR. * 0 0 0 0 0 0 0 0 0 0 160 0 0
0 0 0 0 0 0 0 0 0

```

PAGE 6

JOB: I-80 - CO STUDY - ALTB 2045
HIGHEST INTERSECTION (ANN/BROAD/5TH/MAIN)

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)* REC41 REC42

```

-----*-----
0. * 0.0 0.0
10. * 0.0 0.0
20. * 0.0 0.0
30. * 0.0 0.0
40. * 0.0 0.0
50. * 0.0 0.0
60. * 0.0 0.0
70. * 0.0 0.0
80. * 0.0 0.0
90. * 0.0 0.0
100. * 0.0 0.0
110. * 0.0 0.0
120. * 0.0 0.0
130. * 0.0 0.1
140. * 0.0 0.1
150. * 0.0 0.0
160. * 0.0 0.0
170. * 0.0 0.0
180. * 0.0 0.0
190. * 0.0 0.0
200. * 0.0 0.0
210. * 0.0 0.0
220. * 0.0 0.0
230. * 0.0 0.0
240. * 0.0 0.0
250. * 0.0 0.0
260. * 0.0 0.0
270. * 0.0 0.0
280. * 0.0 0.0

```

```

290. * 0.0 0.0
300. * 0.0 0.0
310. * 0.0 0.0
320. * 0.0 0.0
330. * 0.0 0.0
340. * 0.0 0.0
350. * 0.0 0.0
-----*-----
MAX * 0.0 0.1
DEGR. * 0 130

```

THE HIGHEST CONCENTRATION OF 0.10 PPM OCCURRED AT RECEPTOR REC10.

PAGE 7

JOB: I-80 - CO STUDY - ALTB 2045
HIGHEST INTERSECTION (ANN/BROAD/5TH/MAIN)

RUN:

DATE : 03/12/ 0
TIME : 12:50:19

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 REC19 REC20
LINK # * 0 0 0 40 40 170 180 210 220 0
0 180 170 170 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 0.0
0.0 0.1 0.1 0.1 0.1 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 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 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 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 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 0.1 0.1 0.1 0.1 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 0.0 0.0 0.0 0.0 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 0.0 0.0 0.0 0.0 0.0
9 * 0.0 0.0 0.0 0.0 0.1 0.1 0.1 0.1 0.1 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
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 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 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	13	*	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0
0.0	15	*	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	17	*	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	19	*	0.0	0.0	0.0	0.0	0.0	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	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	22	*	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	24	*	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	26	*	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	28	*	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

PAGE 8

JOB: I-80 - CO STUDY - ALTB 2045
 HIGHEST INTERSECTION (ANN/BROAD/5TH/MAIN)

RUN:

DATE : 03/12/ 0
 TIME : 12:50:19

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

		* CO/LINK (PPM)											
		* ANGLE (DEGREES)											
		REC21	REC22	REC23	REC24	REC25	REC26	REC27	REC28	REC29	REC30	REC31	REC32
LINK #	*	REC33	REC34	REC35	REC36	REC37	REC38	REC39	REC40				
0	0	0	0	0	0	0	0	0	0	0	0	0	0
											160		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	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	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	0.0	0.0	0.0	0.0	0.0

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JOB: I-80 - CO STUDY - ALTB 2045
 HIGHEST INTERSECTION (ANN/BROAD/5TH/MAIN)

RUN:

DATE : 03/12/ 0
 TIME : 12:50:19






















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

	*	CO/LINK (PPM)	
	*	ANGLE (DEGREES)	
	*	REC41 REC42	
LINK #	*	0 130	
	*	-----	
1	*	0.0 0.0	
2	*	0.0 0.0	
3	*	0.0 0.0	
4	*	0.0 0.0	
5	*	0.0 0.0	
6	*	0.0 0.0	
7	*	0.0 0.0	
8	*	0.0 0.0	
9	*	0.0 0.0	
10	*	0.0 0.0	
11	*	0.0 0.0	
12	*	0.0 0.1	
13	*	0.0 0.0	
14	*	0.0 0.0	
15	*	0.0 0.0	
16	*	0.0 0.0	
17	*	0.0 0.0	
18	*	0.0 0.0	
19	*	0.0 0.0	
20	*	0.0 0.0	
21	*	0.0 0.0	
22	*	0.0 0.0	
23	*	0.0 0.0	
24	*	0.0 0.0	
25	*	0.0 0.0	
26	*	0.0 0.0	
27	*	0.0 0.0	
28	*	0.0 0.0	
29	*	0.0 0.0	

APPENDIX C
SYNCHRO REPORTS / TRAFFIC DATA

Lanes, Volumes, Timings
8: Dreher Ave/School Drive & Main Street

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	113	432	24	96	345	207	24	56	157	103	28	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	14	12	11	12	14	12	14	16	14	14	12
Grade (%)		-1%			0%			1%			1%	
Storage Length (ft)	145		0	125		210	85		0	105		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.988				0.850		0.886			0.901	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1435	1716	0	1468	1598	1409	1469	1525	0	1567	1487	0
Flt Permitted	0.524			0.105			0.699			0.328		
Satd. Flow (perm)	791	1716	0	162	1598	1409	1081	1525	0	541	1487	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				225		123			59	
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		538			949			624			208	
Travel Time (s)		10.5			18.5			12.2			5.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.90	0.58	0.79	0.93	0.92	0.66	0.92	0.81	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	10%	4%	24%	7%	7%	10%	10%	10%	4%	10%	10%	10%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	123	480	41	122	371	225	36	61	194	112	30	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	123	521	0	122	371	225	36	255	0	112	89	0
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	2	2		1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	17.0	17.0		12.0	17.0	17.0	13.0	13.0		13.0	13.0	
Total Split (s)	43.0	43.0		12.0	55.0	55.0	31.0	31.0		31.0	31.0	
Total Split (%)	35.8%	35.8%		10.0%	45.8%	45.8%	25.8%	25.8%		25.8%	25.8%	
Maximum Green (s)	36.0	36.0		5.0	48.0	48.0	25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	0.0	-2.0	-2.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	7.0	4.0	4.0		6.0	6.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	34.0
Total Split (s)	34.0
Total Split (%)	28%
Maximum Green (s)	32.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Minimum Gap (s)	3.0

Lanes, Volumes, Timings
8: Dreher Ave/School Drive & Main Street

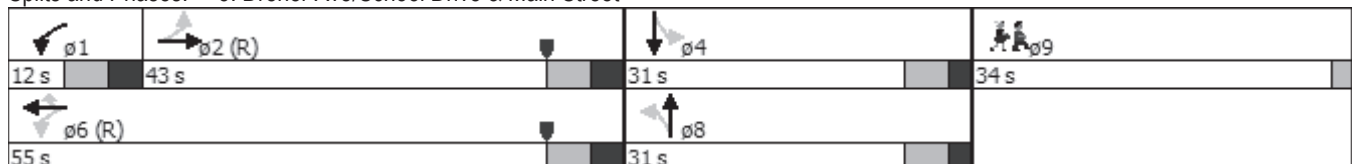
Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	C-Max	C-Max		None	C-Max	C-Max	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	38.0	38.0		50.0	50.0	48.0	27.0	27.0		25.0	25.0	
Actuated g/C Ratio	0.32	0.32		0.42	0.42	0.40	0.22	0.22		0.21	0.21	
v/c Ratio	0.49	0.95		0.85	0.56	0.32	0.15	0.58		1.00	0.25	
Control Delay	41.3	69.2		71.5	31.8	7.4	39.3	26.9		133.9	18.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	41.3	69.2		71.5	31.8	7.4	39.3	26.9		133.9	18.2	
LOS	D	E		E	C	A	D	C		F	B	
Approach Delay		63.9			30.9			28.5			82.7	
Approach LOS		E			C			C			F	
Queue Length 50th (ft)	77	392		65	254	25	23	90		87	19	
Queue Length 95th (ft)	142	#615		#123	359	81	38	180		#209	65	
Internal Link Dist (ft)		458			869			544			128	
Turn Bay Length (ft)	145			125		210	85			105		
Base Capacity (vph)	250	546		143	665	698	243	438		112	356	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.49	0.95		0.85	0.56	0.32	0.15	0.58		1.00	0.25	

Intersection Summary

Area Type: CBD
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 114 (95%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.00
 Intersection Signal Delay: 47.6
 Intersection Capacity Utilization 69.8%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service C
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 8: Dreher Ave/School Drive & Main Street



Lane Group	ø9
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	25.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings
9: 9th St & Main Street

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	375	14	1	229	133	29	56	49	256	6	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	11	11	12	11	11	11	10	10	10
Grade (%)		4%			1%			5%			-2%	
Storage Length (ft)	0		0	0		0	0		0	135		0
Storage Lanes	0		0	0		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.989				0.850		0.955			0.875	
Flt Protected		0.986			0.999			0.986		0.950		
Satd. Flow (prot)	0	2759	0	0	1551	1276	0	1508	0	1487	1410	0
Flt Permitted		0.706			0.993			0.899		0.585		
Satd. Flow (perm)	0	1976	0	0	1542	1276	0	1375	0	916	1410	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			35	
Link Distance (ft)		352			552			437			1438	
Travel Time (s)		7.9			5.2			11.9			4.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.94	0.32	0.25	0.87	0.79	0.56	0.82	0.82	0.96	0.50	0.68
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	3%	0%	0%	6%	2%	0%	0%	2%	3%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)		0	0			0						
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	169	399	44	4	263	168	52	68	60	267	12	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	612	0	0	267	168	0	180	0	267	72	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	9.5	14.5		14.5	14.5	14.5	13.0	13.0		13.0	13.0	
Total Split (s)	9.5	46.0		36.5	36.5	36.5	50.0	50.0		50.0	50.0	
Total Split (%)	7.9%	38.3%		30.4%	30.4%	30.4%	41.7%	41.7%		41.7%	41.7%	
Maximum Green (s)	5.0	41.5		32.0	32.0	32.0	44.0	44.0		44.0	44.0	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-0.5			-0.5	-0.5		-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0			4.0	4.0		4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	

Lane Group ø9

Lane Configurations

Volume (vph)

Ideal Flow (vphpl)

Lane Width (ft)

Grade (%)

Storage Length (ft)

Storage Lanes

Taper Length (ft)

Lane Util. Factor

Ped Bike Factor

Frt

Flt Protected

Satd. Flow (prot)

Flt Permitted

Satd. Flow (perm)

Right Turn on Red

Satd. Flow (RTOR)

Link Speed (mph)

Link Distance (ft)

Travel Time (s)

Confl. Peds. (#/hr)

Confl. Bikes (#/hr)

Peak Hour Factor

Growth Factor

Heavy Vehicles (%)

Bus Blockages (#/hr)

Parking (#/hr)

Mid-Block Traffic (%)

Adj. Flow (vph)

Shared Lane Traffic (%)

Lane Group Flow (vph)

Turn Type

Protected Phases 9

Permitted Phases

Detector Phase

Switch Phase

Minimum Initial (s) 1.0

Minimum Split (s) 24.0

Total Split (s) 24.0

Total Split (%) 20%

Maximum Green (s) 22.0

Yellow Time (s) 2.0

All-Red Time (s) 0.0

Lost Time Adjust (s)

Total Lost Time (s)

Lead/Lag

Lead-Lag Optimize?

Vehicle Extension (s) 3.0

Minimum Gap (s) 3.0

Lanes, Volumes, Timings
9: 9th St & Main Street

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

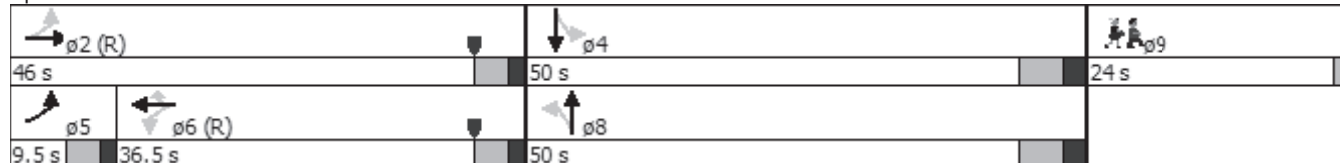
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		48.4		48.4	48.4		39.6			39.6	39.6	
Actuated g/C Ratio		0.40		0.40	0.40		0.33			0.33	0.33	
v/c Ratio		0.77		0.43	0.33		0.40			0.88	0.15	
Control Delay		20.3		26.0	24.9		32.4			66.7	27.0	
Queue Delay		0.0		0.0	0.0		0.0			0.0	0.0	
Total Delay		20.3		26.0	24.9		32.4			66.7	27.0	
LOS		C		C	C		C			E	C	
Approach Delay		20.3		25.5			32.4				58.3	
Approach LOS		C		C			C				E	
Queue Length 50th (ft)		189		144	90		104			188	38	
Queue Length 95th (ft)		m248		186	115		142			#318	37	
Internal Link Dist (ft)		272		472			357				1358	
Turn Bay Length (ft)										135		
Base Capacity (vph)		796		621	514		527			351	540	
Starvation Cap Reductn		0		0	0		0			0	0	
Spillback Cap Reductn		0		0	0		0			0	0	
Storage Cap Reductn		0		0	0		0			0	0	
Reduced v/c Ratio		0.77		0.43	0.33		0.34			0.76	0.13	

Intersection Summary

Area Type: CBD
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 42 (35%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 31.4
 Intersection Capacity Utilization 62.7%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service B

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: 9th St & Main Street



Lane Group	ø9
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	Ped
Walk Time (s)	8.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings
10: 8th St & Main Street/Main Street

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	577	39	8	292	14	65	47	40	56	19	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	13	13	13	10	10	10	10	10	10
Grade (%)		0%			0%			1%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.987			0.992			0.964			0.954	
Flt Protected		0.996			0.998			0.981			0.978	
Satd. Flow (prot)	0	*3502	0	0	*1772	0	0	*1760	0	0	*1624	0
Flt Permitted		0.877			0.961			0.820			0.739	
Satd. Flow (perm)	0	*3021	0	0	*1733	0	0	*1405	0	0	*1397	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		552			555			340			310	
Travel Time (s)		8.5			8.2			9.3			8.5	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.66	0.89	0.57	0.50	0.81	0.58	0.86	0.69	0.77	0.88	0.68	0.83
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	2%	0%	0%	3%	0%	2%	0%	5%	2%	0%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)		0	0	0	0	0	0	0	0			
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	68	648	68	16	360	24	76	68	52	64	28	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	784	0	0	400	0	0	196	0	0	140	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.5	14.5		14.5	14.5		12.5	12.5		12.5	12.5	
Total Split (s)	22.5	22.5		22.5	22.5		15.5	15.5		15.5	15.5	
Total Split (%)	37.5%	37.5%		37.5%	37.5%		25.8%	25.8%		25.8%	25.8%	
Maximum Green (s)	18.0	18.0		18.0	18.0		10.0	10.0		10.0	10.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)		-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)		2.5			2.5			3.5			3.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	37%
Maximum Green (s)	20.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Minimum Gap (s)	3.0

Lanes, Volumes, Timings
10: 8th St & Main Street/Main Street

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

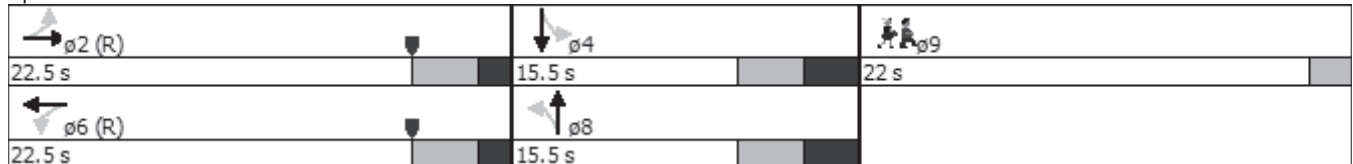
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		22.3			22.3			11.7			11.7	
Actuated g/C Ratio		0.37			0.37			0.20			0.20	
v/c Ratio		0.70			0.62			0.72			0.52	
Control Delay		16.2			14.7			40.0			29.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		16.2			14.7			40.0			29.1	
LOS		B			B			D			C	
Approach Delay		16.2			14.7			40.0			29.1	
Approach LOS		B			B			D			C	
Queue Length 50th (ft)		148			121			66			45	
Queue Length 95th (ft)		204			144			92			67	
Internal Link Dist (ft)		472			475			260			230	
Turn Bay Length (ft)												
Base Capacity (vph)		1124			645			281			279	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.70			0.62			0.70			0.50	

Intersection Summary

Area Type: CBD
 Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 36 (60%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.72
 Intersection Signal Delay: 20.1
 Intersection Capacity Utilization 57.7%
 Analysis Period (min) 15
 * User Entered Value

Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 10: 8th St & Main Street/Main Street



Lane Group	ø9
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings

Stroudsburg Boro. A.M. Peak Hour With Peds

11: Seventh St/7th St & Main Street /Main Street

Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	352	108	18	227	13	64	43	56	37	66	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	13	13	13	14	14	14	11	11	11
Grade (%)		-1%			2%			4%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.966			0.991			0.954			0.974	
Flt Protected		0.997			0.995			0.981			0.983	
Satd. Flow (prot)	0	2748	0	0	1478	0	0	1604	0	0	1432	0
Flt Permitted		0.925			0.926			0.738			0.777	
Satd. Flow (perm)	0	2549	0	0	1375	0	0	1207	0	0	1132	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		555			308			456			331	
Travel Time (s)		15.1			8.4			12.4			9.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.61	0.88	0.87	0.64	0.87	0.65	0.80	0.72	0.78	0.54	0.69	0.78
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	6%	6%	2%	0%	6%	0%	5%	0%	7%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)		0	0	0	0	0				0	0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	28	400	124	28	261	20	80	60	72	69	96	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	552	0	0	309	0	0	212	0	0	205	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	15.0		15.0	15.0		12.0	12.0		12.0	12.0	
Total Split (s)	55.0	55.0		55.0	55.0		43.0	43.0		43.0	43.0	
Total Split (%)	45.8%	45.8%		45.8%	45.8%		35.8%	35.8%		35.8%	35.8%	
Maximum Green (s)	50.0	50.0		50.0	50.0		38.0	38.0		38.0	38.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)		3.0			3.0			3.0			3.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	18%
Maximum Green (s)	20.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Minimum Gap (s)	3.0

Lanes, Volumes, Timings

Stroudsburg Boro. A.M. Peak Hour With Peds

11: Seventh St/7th St & Main Street /Main Street

Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		64.2			64.2			27.8			27.8	
Actuated g/C Ratio		0.54			0.54			0.23			0.23	
v/c Ratio		0.40			0.42			0.76			0.79	
Control Delay		12.9			9.6			48.7			62.9	
Queue Delay		0.0			0.4			0.0			0.0	
Total Delay		12.9			10.0			48.7			62.9	
LOS		B			A			D			E	
Approach Delay		12.9			10.0			48.7			62.9	
Approach LOS		B			A			D			E	
Queue Length 50th (ft)		121			38			112			150	
Queue Length 95th (ft)		152			60			124			153	
Internal Link Dist (ft)		475			228			376			251	
Turn Bay Length (ft)												
Base Capacity (vph)		1364			736			402			377	
Starvation Cap Reductn		0			127			0			0	
Spillback Cap Reductn		7			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.41			0.51			0.53			0.54	

Intersection Summary

Area Type: CBD
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 26.1
 Intersection Capacity Utilization 53.2%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service A

Splits and Phases: 11: Seventh St/7th St & Main Street /Main Street

ø2 (R) 55 s				ø4 43 s				ø9 22 s			
ø6 (R) 55 s				ø8 43 s							

Lane Group	ø9
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	Ped
Walk Time (s)	9.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings
12: Seventh St & Ann St

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	13	133	21	155	227	0	0	189	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	16	16	16	16	16	16	10	10	10
Grade (%)		0%			2%			-5%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.981						0.974	
Flt Protected					0.995			0.981				
Satd. Flow (prot)	0	0	0	0	1783	0	0	2131	0	0	1530	0
Flt Permitted					0.995			0.678				
Satd. Flow (perm)	0	0	0	0	1783	0	0	1473	0	0	1530	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)					15						23	
Link Speed (mph)		25			25			35			25	
Link Distance (ft)		273			284			513			456	
Travel Time (s)		7.4			7.7			10.0			12.4	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.65	0.90	0.75	0.95	0.92	0.92	0.92	0.76	0.70
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	15%	2%	14%	1%	2%	0%	0%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)				0	0	0					0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	0	0	20	148	28	163	247	0	0	249	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	196	0	0	410	0	0	309	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					6		3	8			4	
Permitted Phases				6			8					
Detector Phase				6	6		3	8			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	7.0			7.0	
Minimum Split (s)				23.0	23.0		10.5	20.5			20.5	
Total Split (s)				23.5	23.5		10.5	36.5			26.0	
Total Split (%)				39.2%	39.2%		17.5%	60.8%			43.3%	
Maximum Green (s)				18.5	18.5		5.0	31.0			20.5	
Yellow Time (s)				3.5	3.5		4.0	4.0			4.0	
All-Red Time (s)				1.5	1.5		1.5	1.5			1.5	
Lost Time Adjust (s)					-1.0			-1.0			-1.0	
Total Lost Time (s)					4.0			4.5			4.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Minimum Gap (s)				3.0	3.0		3.0	3.0			3.0	

Lanes, Volumes, Timings
12: Seventh St & Ann St

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

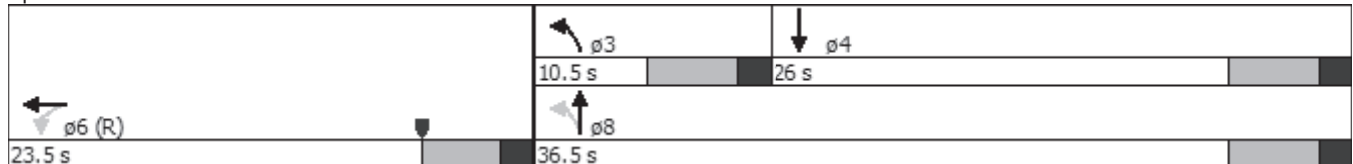
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)				0.0	0.0		0.0	0.0			0.0	
Time To Reduce (s)				0.0	0.0		0.0	0.0			0.0	
Recall Mode				C-Max	C-Max		None	None			None	
Walk Time (s)				7.0	7.0			7.0			7.0	
Flash Dont Walk (s)				11.0	11.0			8.0			8.0	
Pedestrian Calls (#/hr)				8	8			1			3	
Act Effct Green (s)					25.8			25.7			25.7	
Actuated g/C Ratio					0.43			0.43			0.43	
v/c Ratio					0.25			0.65			0.46	
Control Delay					13.2			17.9			11.1	
Queue Delay					0.0			0.0			0.0	
Total Delay					13.2			17.9			11.1	
LOS					B			B			B	
Approach Delay					13.2			17.9			11.1	
Approach LOS					B			B			B	
Queue Length 50th (ft)					41			108			61	
Queue Length 95th (ft)					94			155			76	
Internal Link Dist (ft)		193			204			433			376	
Turn Bay Length (ft)												
Base Capacity (vph)					775			785			692	
Starvation Cap Reductn					0			0			0	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.25			0.52			0.45	

Intersection Summary

Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 6:WBTL, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.65
 Intersection Signal Delay: 14.6
 Intersection Capacity Utilization 52.8%
 Analysis Period (min) 15


















Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 12: Seventh St & Ann St



HCM 2010 Signalized Intersection Summary
 12: Seventh St & Ann St

Stroudsburg Boro. A.M. Peak Hour With Peds
 Existing Year 2013

Movement												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	13	133	21	155	227	0	0	189	42
Number				1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj				1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00	0.90
Adj Sat Flow veh/h/ln				195.6	186.2	195.6	202.5	199.3	0.0	0.0	187.0	190.0
Lanes				0	1	0	0	1	0	0	1	0
Cap, veh/h				74	546	103	284	393	0	0	474	114
Arrive On Green				0.44	0.44	0.42	0.36	0.36	0.00	0.00	0.72	0.68
Sat Flow, veh/h				166	1228	232	469	1087	0	0	1311	316
Grp Volume(v), veh/h				196	0	0	410	0	0	0	0	309
Grp Sat Flow(s),veh/h/ln				1627	0	0	1556	0	0	0	0	1627
Q Serve(g_s), s				3.3	0.0	0.0	0.1	0.0	0.0	0.0	0.0	3.8
Cycle Q Clear(g_c), s				3.3	0.0	0.0	9.9	0.0	0.0	0.0	0.0	3.8
Prop In Lane				0.10		0.14	0.40		0.00	0.00		0.19
Lane Grp Cap(c), veh/h				724	0	0	677	0	0	0	0	588
V/C Ratio(X)				0.27	0.00	0.00	0.61	0.00	0.00	0.00	0.00	0.53
Avail Cap(c_a), veh/h				724	0	0	1244	0	0	0	0	798
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.52
Uniform Delay (d), s/veh				7.7	0.0	0.0	11.9	0.0	0.0	0.0	0.0	4.6
Incr Delay (d2), s/veh				0.9	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.4
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln				1.3	0.0	0.0	3.0	0.0	0.0	0.0	0.0	1.0
Lane Grp Delay (d), s/veh				8.7	0.0	0.0	12.8	0.0	0.0	0.0	0.0	4.9
Lane Grp LOS				A			B					A
Approach Vol, veh/h					196			410			309	
Approach Delay, s/veh					8.7			12.8			4.9	
Approach LOS					A			B			A	
Timer												
Assigned Phs					6		3	8				4
Phs Duration (G+Y+Rc), s					23.5		0.0	20.3			20.3	
Change Period (Y+Rc), s					5.0		5.5	5.5			5.5	
Max Green Setting (Gmax), s					18.5		5.0	31.0			20.5	
Max Q Clear Time (g_c+I1), s					5.3		0.0	11.9			5.8	
Green Ext Time (p_c), s					0.4		0.0	2.9			2.7	
Intersection Summary												
HCM 2010 Ctrl Delay					9.3							
HCM 2010 LOS					A							
Notes												

Lanes, Volumes, Timings
13: 6th St & Main Street

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	104	504	14	8	244	45	10	69	36	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	16	16	16	11	11	11	12	12	12
Grade (%)		-1%			2%			-1%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995			0.977			0.957				
Flt Protected		0.989			0.998			0.996				
Satd. Flow (prot)	0	2867	0	0	1619	0	0	1569	0	0	0	0
Flt Permitted		0.752			0.973			0.996				
Satd. Flow (perm)	0	2180	0	0	1579	0	0	1569	0	0	0	0
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)		5			14							35
Link Speed (mph)		35			35			35				35
Link Distance (ft)		308			744			383				229
Travel Time (s)		6.0			14.5			7.5				4.5
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.70	0.96	0.58	0.67	0.86	0.75	0.63	0.66	0.64	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	3%	7%	0%	5%	0%	0%	0%	3%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)		0	0	0	0	0						
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	149	525	24	12	284	60	16	105	56	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	698	0	0	356	0	0	177	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA				
Protected Phases		2			6			4				
Permitted Phases	2			6			4					
Detector Phase	2	2		6	6		4	4				
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0				
Minimum Split (s)	15.0	15.0		15.0	15.0		12.0	12.0				
Total Split (s)	70.0	70.0		70.0	70.0		31.0	31.0				
Total Split (%)	58.3%	58.3%		58.3%	58.3%		25.8%	25.8%				
Maximum Green (s)	65.0	65.0		65.0	65.0		26.0	26.0				
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5				
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5				
Lost Time Adjust (s)		-1.0			-1.0			-1.0				
Total Lost Time (s)		4.0			4.0			4.0				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0				
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0				

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	19.0
Total Split (s)	19.0
Total Split (%)	16%
Maximum Green (s)	17.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Minimum Gap (s)	3.0

Lanes, Volumes, Timings
13: 6th St & Main Street

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None				
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		73.3			73.3			19.7				
Actuated g/C Ratio		0.61			0.61			0.16				
v/c Ratio		0.52			0.37			0.69				
Control Delay		12.2			11.3			60.4				
Queue Delay		0.2			0.0			0.0				
Total Delay		12.4			11.3			60.4				
LOS		B			B			E				
Approach Delay		12.4			11.3			60.4				
Approach LOS		B			B			E				
Queue Length 50th (ft)		94			118			131				
Queue Length 95th (ft)		120			130			136				
Internal Link Dist (ft)		228			664			303			149	
Turn Bay Length (ft)												
Base Capacity (vph)		1332			969			353				
Starvation Cap Reductn		153			0			0				
Spillback Cap Reductn		0			14			0				
Storage Cap Reductn		0			0			0				
Reduced v/c Ratio		0.59			0.37			0.50				

Intersection Summary

Area Type: CBD
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 5 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.69
 Intersection Signal Delay: 19.0
 Intersection Capacity Utilization 54.2%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 13: 6th St & Main Street



Lane Group	ø9
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	10.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings
14: Ann St & Broad St/5th St & Main Street

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

	→	↘	↙	↗	↘	↓	↗	ø9
Lane Group	EBT	EBR	NBL2	NBR	SBL	SBT	SBR2	
Lane Configurations	↑↑		↘	↗	↘	↑	↗	
Volume (vph)	337	27	173	440	87	376	263	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	11	10	11	10	10	11	
Grade (%)	-5%					2%		
Storage Length (ft)		0		0	0			
Storage Lanes		0		1	1			
Taper Length (ft)					25			
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor								
Frt	0.986			0.850			0.850	
Flt Protected			0.950		0.950			
Satd. Flow (prot)	*3372	0	1494	1371	*1752	*1793	1337	
Flt Permitted			0.275		0.950			
Satd. Flow (perm)	*3372	0	432	1371	*1752	*1792	1337	
Right Turn on Red				No	No		Yes	
Satd. Flow (RTOR)							325	
Link Speed (mph)	25					25		
Link Distance (ft)	744					298		
Travel Time (s)	20.3					8.2		
Confl. Peds. (#/hr)								
Confl. Bikes (#/hr)								
Peak Hour Factor	0.87	0.68	0.80	0.92	0.64	0.88	0.81	
Growth Factor	100%	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	2%	0%	2%	3%	2%	5%	4%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	
Parking (#/hr)								
Mid-Block Traffic (%)	0%					0%		
Adj. Flow (vph)	387	40	216	478	136	427	325	
Shared Lane Traffic (%)								
Lane Group Flow (vph)	427	0	216	478	136	427	325	
Turn Type	NA		custom	custom	pm+pt	NA	custom	
Protected Phases	8		1	6	5	2		9
Permitted Phases			6		2		2 8	
Detector Phase	8		1	6	5	2	2 8	
Switch Phase								
Minimum Initial (s)	7.0		5.0	10.0	5.0	10.0		1.0
Minimum Split (s)	14.0		12.5	16.5	11.5	16.5		22.0
Total Split (s)	25.0		23.5	61.5	11.5	49.5		22.0
Total Split (%)	20.8%		19.6%	51.3%	9.6%	41.3%		18%
Maximum Green (s)	18.0		17.0	55.0	5.0	43.0		20.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0		2.0
All-Red Time (s)	3.0		2.5	2.5	2.5	2.5		0.0
Lost Time Adjust (s)	-2.5		0.0	-2.5	-2.5	-2.5		
Total Lost Time (s)	4.5		6.5	4.0	4.0	4.0		
Lead/Lag			Lead	Lag	Lead	Lag		
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		3.0
Minimum Gap (s)	3.0		3.0	3.0	3.0	3.0		3.0

Lanes, Volumes, Timings
 14: Ann St & Broad St/5th St & Main Street

Stroudsburg Boro. A.M. Peak Hour With Peds
 Existing Year 2013

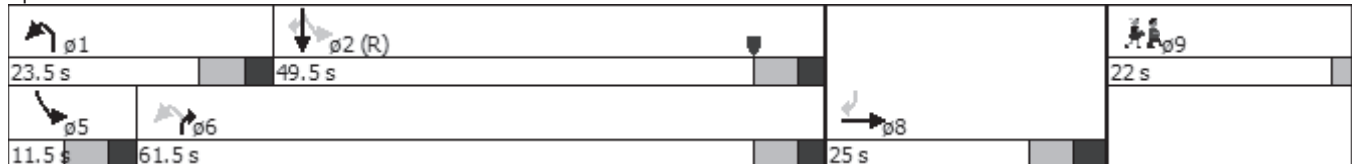
	→	↘	↙	↗	↘	↓	↙	ø9
Lane Group	EBT	EBR	NBL2	NBR	SBL	SBT	SBR2	ø9
Time Before Reduce (s)	0.0		0.0	0.0	0.0	0.0		0.0
Time To Reduce (s)	0.0		0.0	0.0	0.0	0.0		0.0
Recall Mode	None		None	None	None	C-Max		Ped
Walk Time (s)								7.0
Flash Dont Walk (s)								13.0
Pedestrian Calls (#/hr)								15
Act Effct Green (s)	20.0		66.3	57.6	56.9	49.0	71.0	
Actuated g/C Ratio	0.17		0.55	0.48	0.47	0.41	0.59	
v/c Ratio	0.76		0.60	0.73	0.16	0.58	0.35	
Control Delay	43.6		21.2	32.8	12.1	30.7	4.1	
Queue Delay	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	43.6		21.2	32.8	12.1	30.7	4.1	
LOS	D		C	C	B	C	A	
Approach Delay	43.6					18.1		
Approach LOS	D					B		
Queue Length 50th (ft)	144		83	288	48	246	13	
Queue Length 95th (ft)	206		113	429	49	327	42	
Internal Link Dist (ft)	664					218		
Turn Bay Length (ft)			190					
Base Capacity (vph)	576		391	658	830	732	927	
Starvation Cap Reductn	0		0	0	0	0	0	
Spillback Cap Reductn	0		0	0	0	0	0	
Storage Cap Reductn	0		0	0	0	0	0	
Reduced v/c Ratio	0.74		0.55	0.73	0.16	0.58	0.35	

Intersection Summary

Area Type: CBD
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 105 (88%), Referenced to phase 2:SBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.76
 Intersection Signal Delay: 27.4
 Intersection Capacity Utilization 57.3%
 Analysis Period (min) 15
 * User Entered Value

Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 14: Ann St & Broad St/5th St & Main Street



HCM 2010 methodology does not support more than 4 approaches.

Lanes, Volumes, Timings
20: McConnell St & 4th St

Stroudsburg Boro. A.M. Peak Hour With Peds

Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	18	8	88	1	0	0	0	0	62	529	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	14	14	14	12	12	12	14	14	14
Grade (%)		1%			-1%			0%			1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor												
Frt		0.939										
Flt Protected					0.953						0.994	
Satd. Flow (prot)	0	*862	0	*619	1665	0	0	0	0	0	*1459	0
Flt Permitted					0.696						0.994	
Satd. Flow (perm)	0	*862	0	*606	1216	0	0	0	0	0	*1459	0
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)		20										
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		163			256			357			512	
Travel Time (s)		4.4			7.0			7.6			14.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.75	0.40	0.82	0.92	0.92	0.92	0.92	0.92	0.74	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	24	20	107	1	0	0	0	0	84	575	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	44	0	0	108	0	0	0	0	0	659	0
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		7.0		7.0	7.0					10.0	10.0	
Minimum Split (s)		22.0		22.0	22.0					21.0	21.0	
Total Split (s)		22.0		22.0	22.0					38.0	38.0	
Total Split (%)		36.7%		36.7%	36.7%					63.3%	63.3%	
Maximum Green (s)		17.0		17.0	17.0					33.0	33.0	
Yellow Time (s)		3.5		3.5	3.5					3.5	3.5	
All-Red Time (s)		1.5		1.5	1.5					1.5	1.5	
Lost Time Adjust (s)		-1.0			0.0						-1.0	
Total Lost Time (s)		4.0			5.0						4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	
Minimum Gap (s)		3.0		3.0	3.0					3.0	3.0	

Lanes, Volumes, Timings
20: McConnell St & 4th St

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)		0.0		0.0	0.0					0.0	0.0	
Time To Reduce (s)		0.0		0.0	0.0					0.0	0.0	
Recall Mode		None		None	None					C-Max	C-Max	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		10.0		10.0	10.0					9.0	9.0	
Pedestrian Calls (#/hr)		8		1	1					8	8	
Act Effct Green (s)		12.2			11.2							43.0
Actuated g/C Ratio		0.20			0.19							0.72
v/c Ratio		0.23			0.48							0.63
Control Delay		15.0			27.8							7.4
Queue Delay		0.0			0.0							0.0
Total Delay		15.0			27.8							7.4
LOS		B			C							A
Approach Delay		15.0			27.8							7.4
Approach LOS		B			C							A
Queue Length 50th (ft)		7			36							10
Queue Length 95th (ft)		21			67							#185
Internal Link Dist (ft)		83			176			277				432
Turn Bay Length (ft)												
Base Capacity (vph)		272			344							1046
Starvation Cap Reductn		0			0							0
Spillback Cap Reductn		0			0							0
Storage Cap Reductn		0			0							0
Reduced v/c Ratio		0.16			0.31							0.63

Intersection Summary

















Area Type: CBD
 Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 31 (52%), Referenced to phase 6:SBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.63
 Intersection Signal Delay: 10.5
 Intersection Capacity Utilization 37.9%
 Analysis Period (min) 15
 * User Entered Value
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 20: McConnell St & 4th St





















HCM 2010 Signalized Intersection Summary
 20: McConnell St & 4th St

Stroudsburg Boro. A.M. Peak Hour With Peds
 Existing Year 2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											 	
Volume (veh/h)	0	18	8	88	1	0	0	0	0	62	529	0
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	177.0	177.0	178.7	170.3	0.0				177.0	172.4	0.0
Lanes	0	1	0	0	1	0				0	2	0
Cap, veh/h	0	137	115	284	2	0				286	2062	0
Arrive On Green	0.00	0.15	0.13	0.15	0.13	0.00				0.68	0.68	0.00
Sat Flow, veh/h	0	894	745	1043	14	0				417	3011	0
Grp Volume(v), veh/h	0	0	44	108	0	0				343	316	0
Grp Sat Flow(s),veh/h/ln	0	0	1638	1057	0	0				1704	1724	0
Q Serve(g_s), s	0.0	0.0	1.2	4.1	0.0	0.0				3.9	3.5	0.0
Cycle Q Clear(g_c), s	0.0	0.0	1.2	5.2	0.0	0.0				3.9	3.5	0.0
Prop In Lane	0.00		0.45	0.99		0.00				0.24		0.00
Lane Grp Cap(c), veh/h	0	0	252	307	0	0				1167	1181	0
V/C Ratio(X)	0.00	0.00	0.17	0.35	0.00	0.00				0.29	0.27	0.00
Avail Cap(c_a), veh/h	0	0	594	567	0	0				1167	1181	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	0.00				1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	18.5	21.0	0.0	0.0				3.1	3.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.3	0.7	0.0	0.0				0.6	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.0	0.0	0.5	1.2	0.0	0.0				1.3	1.1	0.0
Lane Grp Delay (d), s/veh	0.0	0.0	18.8	21.6	0.0	0.0				3.7	3.6	0.0
Lane Grp LOS			B	C						A	A	
Approach Vol, veh/h		44			108						659	
Approach Delay, s/veh		18.8			21.6						3.7	
Approach LOS		B			C						A	
Timer												
Assigned Phs		4			8						6	
Phs Duration (G+Y+Rc), s		11.6			11.6						38.0	
Change Period (Y+Rc), s		5.0			5.0						5.0	
Max Green Setting (Gmax), s		17.0			17.0						33.0	
Max Q Clear Time (g_c+I1), s		3.2			7.2						0.0	
Green Ext Time (p_c), s		0.4			0.3						0.0	
Intersection Summary												
HCM 2010 Ctrl Delay			6.9									
HCM 2010 LOS			A									
Notes												

Lanes, Volumes, Timings
21: McConnell St & 3rd St

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											  	
Volume (vph)	0	64	49	13	92	0	0	0	0	4	662	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	12	12	12	13	11	14
Grade (%)		1%			-2%			0%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		175
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor												
Frt		0.935										0.850
Flt Protected					0.992						0.999	
Satd. Flow (prot)	0	*1762	0	0	*1857	0	0	0	0	0	*1931	1513
Flt Permitted					0.932						0.999	
Satd. Flow (perm)	0	*1762	0	0	*1857	0	0	0	0	0	*1931	1513
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)		64										88
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		348			248			268			452	
Travel Time (s)		9.5			6.8			7.3			7.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.94	0.77	0.65	0.92	0.92	0.92	0.92	0.92	0.33	0.86	0.81
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	6%	2%	8%	3%	0%	0%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	68	64	20	100	0	0	0	0	12	770	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	132	0	0	120	0	0	0	0	0	782	88
Turn Type		NA		Perm	NA					Perm	NA	Perm
Protected Phases		4			8						6	
Permitted Phases				8						6		6
Detector Phase		4		8	8					6	6	6
Switch Phase												
Minimum Initial (s)		7.0		7.0	7.0					10.0	10.0	10.0
Minimum Split (s)		28.0		28.0	28.0					21.0	21.0	21.0
Total Split (s)		28.0		28.0	28.0					32.0	32.0	32.0
Total Split (%)		46.7%		46.7%	46.7%					53.3%	53.3%	53.3%
Maximum Green (s)		23.0		23.0	23.0					27.0	27.0	27.0
Yellow Time (s)		3.0		3.0	3.0					3.5	3.5	3.5
All-Red Time (s)		2.0		2.0	2.0					1.5	1.5	1.5
Lost Time Adjust (s)		-1.0			-1.0						-1.0	-1.0
Total Lost Time (s)		4.0			4.0						4.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	3.0
Minimum Gap (s)		3.0		3.0	3.0					3.0	3.0	3.0

Lanes, Volumes, Timings
21: McConnell St & 3rd St

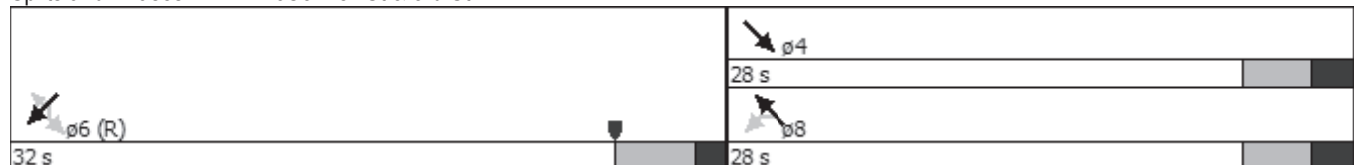
Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Time Before Reduce (s)		0.0		0.0	0.0					0.0	0.0	0.0
Time To Reduce (s)		0.0		0.0	0.0					0.0	0.0	0.0
Recall Mode		None		None	None					C-Max	C-Max	C-Max
Walk Time (s)		9.0		9.0	9.0					7.0	7.0	7.0
Flash Dont Walk (s)		14.0		14.0	14.0					9.0	9.0	9.0
Pedestrian Calls (#/hr)		5		5	5					1	1	1
Act Effct Green (s)		12.5			12.5						42.7	42.7
Actuated g/C Ratio		0.21			0.21						0.71	0.71
v/c Ratio		0.32			0.31						0.57	0.08
Control Delay		11.9			20.3						10.7	2.3
Queue Delay		0.0			0.0						0.0	0.0
Total Delay		11.9			20.3						10.7	2.3
LOS		B			C						B	A
Approach Delay		11.9			20.3						9.9	
Approach LOS		B			C						A	
Queue Length 50th (ft)		22			39						58	0
Queue Length 95th (ft)		43			56						#216	15
Internal Link Dist (ft)		268			168			188			372	
Turn Bay Length (ft)												175
Base Capacity (vph)		743			742						1373	1101
Starvation Cap Reductn		0			0						0	0
Spillback Cap Reductn		0			0						0	0
Storage Cap Reductn		0			0						0	0
Reduced v/c Ratio		0.18			0.16						0.57	0.08

Intersection Summary


















Area Type: CBD
 Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 13 (22%), Referenced to phase 6:SWTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.57
 Intersection Signal Delay: 11.2
 Intersection Capacity Utilization 40.0%
 Analysis Period (min) 15
 * User Entered Value
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 21: McConnell St & 3rd St



HCM 2010 Signalized Intersection Summary
 21: McConnell St & 3rd St

Stroudsburg Boro. A.M. Peak Hour With Peds
 Existing Year 2013

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											 	
Volume (veh/h)	0	64	49	13	92	0	0	0	0	4	662	71
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	170.1	170.1	172.7	164.5	0.0				178.7	166.9	173.5
Lanes	0	1	0	0	1	0				0	2	1
Cap, veh/h	0	142	133	121	227	0				31	2108	946
Arrive On Green	0.00	0.18	0.15	0.18	0.18	0.00				0.64	0.64	0.64
Sat Flow, veh/h	0	807	760	143	1293	0				49	3287	1475
Grp Volume(v), veh/h	0	0	132	120	0	0				409	373	88
Grp Sat Flow(s),veh/h/ln	0	0	1567	1436	0	0				1667	1669	1475
Q Serve(g_s), s	0.0	0.0	3.3	0.2	0.0	0.0				5.1	4.5	1.0
Cycle Q Clear(g_c), s	0.0	0.0	3.3	3.5	0.0	0.0				5.1	4.5	1.0
Prop In Lane	0.00		0.48	0.17		0.00				0.03		1.00
Lane Grp Cap(c), veh/h	0	0	275	348	0	0				1069	1070	946
V/C Ratio(X)	0.00	0.00	0.48	0.34	0.00	0.00				0.38	0.35	0.09
Avail Cap(c_a), veh/h	0	0	861	917	0	0				1069	1070	946
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	16.4	16.0	0.0	0.0				3.7	3.6	3.0
Incr Delay (d2), s/veh	0.0	0.0	1.3	0.6	0.0	0.0				1.0	0.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.0	0.0	1.3	1.1	0.0	0.0				1.6	1.4	0.3
Lane Grp Delay (d), s/veh	0.0	0.0	17.7	16.6	0.0	0.0				4.8	4.5	3.2
Lane Grp LOS			B	B						A	A	A
Approach Vol, veh/h		132			120						870	
Approach Delay, s/veh		17.7			16.6						4.5	
Approach LOS		B			B						A	
Timer												
Assigned Phs		4			8						6	
Phs Duration (G+Y+Rc), s		11.7			11.7						32.0	
Change Period (Y+Rc), s		5.0			5.0						5.0	
Max Green Setting (Gmax), s		23.0			23.0						27.0	
Max Q Clear Time (g_c+I1), s		5.3			5.5						7.1	
Green Ext Time (p_c), s		0.8			0.8						2.2	
Intersection Summary												
HCM 2010 Ctrl Delay			7.4									
HCM 2010 LOS			A									
Notes												

Lanes, Volumes, Timings
24: 5th St & Sarah St

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	62	34	72	2	243	99	27	53	1	18	241	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	12	12	12	11	11	11	16	16	16
Grade (%)		-6%			7%			14%			-10%	
Storage Length (ft)	0		0	0		150	0		0	0		0
Storage Lanes	0		0	0		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.939				0.850		0.999			0.965	
Flt Protected		0.984			0.999			0.985			0.997	
Satd. Flow (prot)	0	1660	0	0	1632	1389	0	1492	0	0	1894	0
Flt Permitted		0.807			0.996			0.827			0.974	
Satd. Flow (perm)	0	1361	0	0	1627	1389	0	1253	0	0	1850	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		92				159		1			28	
Link Speed (mph)		25			35			35			35	
Link Distance (ft)		447			479			476			360	
Travel Time (s)		12.2			9.3			9.3			7.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.77	0.78	0.50	0.75	0.64	0.96	0.83	0.92	0.56	0.74	0.75
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	1%	1%	0%	2%	0%	0%	5%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)	0	0	0									
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	68	44	92	4	324	155	28	64	1	32	326	124
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	204	0	0	328	155	0	93	0	0	482	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	10.5	28.5		28.5	28.5	28.5	26.0	26.0		26.0	26.0	
Total Split (s)	10.5	39.0		28.5	28.5	28.5	26.0	26.0		26.0	26.0	
Total Split (%)	16.2%	60.0%		43.8%	43.8%	43.8%	40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	5.0	33.5		23.0	23.0	23.0	19.0	19.0		19.0	19.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	5.0	5.0		5.0	5.0	
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.5			-1.5	-1.5		-1.5			-1.5	
Total Lost Time (s)		4.0			4.0	4.0		5.5			5.5	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	5.0	5.0		5.0	5.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	2.5	2.5		2.5	2.5	

Lanes, Volumes, Timings
24: 5th St & Sarah St

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

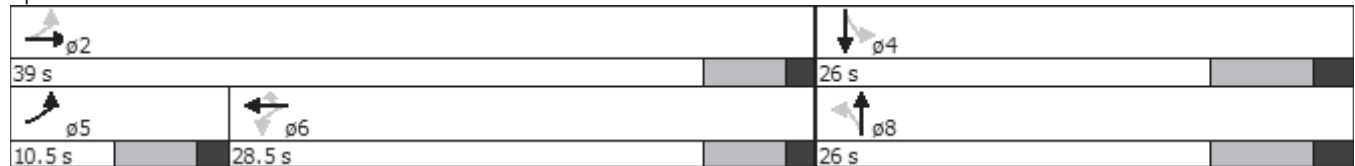
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		3.0	3.0	3.0	26.0	26.0		26.0	26.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	10.0	10.0		10.0	10.0	
Recall Mode	None	None		None	None	None	Min	Min		Min	Min	
Walk Time (s)		11.0		11.0	11.0	11.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		12.0		12.0	12.0	12.0	12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)		1		3	3	3	1	1		5	5	
Act Effct Green (s)		16.3			16.3	16.3		15.8			15.8	
Actuated g/C Ratio		0.39			0.39	0.39		0.38			0.38	
v/c Ratio		0.35			0.52	0.24		0.20			0.68	
Control Delay		7.6			13.9	3.2		10.9			16.4	
Queue Delay		0.0			0.0	0.0		0.0			0.0	
Total Delay		7.6			13.9	3.2		10.9			16.4	
LOS		A			B	A		B			B	
Approach Delay		7.6			10.5			10.9			16.4	
Approach LOS		A			B			B			B	
Queue Length 50th (ft)		17			57	0		13			79	
Queue Length 95th (ft)		42			97	8		42			152	
Internal Link Dist (ft)		367			399			396			280	
Turn Bay Length (ft)						150						
Base Capacity (vph)		1158			989	906		637			955	
Starvation Cap Reductn		0			0	0		0			0	
Spillback Cap Reductn		0			0	0		0			0	
Storage Cap Reductn		0			0	0		0			0	
Reduced v/c Ratio		0.18			0.33	0.17		0.15			0.50	

Intersection Summary

Area Type: CBD
 Cycle Length: 65
 Actuated Cycle Length: 42
 Natural Cycle: 65
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.68
 Intersection Signal Delay: 12.3
 Intersection Capacity Utilization 58.3%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service B






















Splits and Phases: 24: 5th St & Sarah St



HCM 2010 analysis expects stop-line detection. Detectors can not be further than 20 feet from the stop bar.

Lanes, Volumes, Timings
8: Dreher Ave/School Drive & Main Street

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	113	432	24	96	345	207	24	56	157	103	28	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	14	12	11	12	14	12	14	16	14	14	12
Grade (%)		-1%			0%			1%			1%	
Storage Length (ft)	145		0	125		210	85		0	105		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.988				0.850		0.886			0.901	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1435	1716	0	1468	1598	1409	1469	1525	0	1567	1487	0
Flt Permitted	0.524			0.105			0.699			0.328		
Satd. Flow (perm)	791	1716	0	162	1598	1409	1081	1525	0	541	1487	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				225		123			59	
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		538			949			624			208	
Travel Time (s)		10.5			18.5			12.2			5.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.90	0.58	0.79	0.93	0.92	0.66	0.92	0.81	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	10%	4%	24%	7%	7%	10%	10%	10%	4%	10%	10%	10%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	123	480	41	122	371	225	36	61	194	112	30	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	123	521	0	122	371	225	36	255	0	112	89	0
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	2	2		1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	17.0	17.0		12.0	17.0	17.0	13.0	13.0		13.0	13.0	
Total Split (s)	43.0	43.0		12.0	55.0	55.0	31.0	31.0		31.0	31.0	
Total Split (%)	35.8%	35.8%		10.0%	45.8%	45.8%	25.8%	25.8%		25.8%	25.8%	
Maximum Green (s)	36.0	36.0		5.0	48.0	48.0	25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	0.0	-2.0	-2.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	7.0	4.0	4.0		6.0	6.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	34.0
Total Split (s)	34.0
Total Split (%)	28%
Maximum Green (s)	32.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Minimum Gap (s)	3.0

Lanes, Volumes, Timings
8: Dreher Ave/School Drive & Main Street

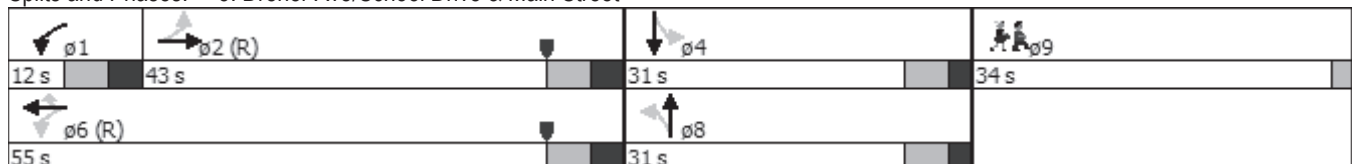
Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	C-Max	C-Max		None	C-Max	C-Max	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	38.0	38.0		50.0	50.0	48.0	27.0	27.0		25.0	25.0	
Actuated g/C Ratio	0.32	0.32		0.42	0.42	0.40	0.22	0.22		0.21	0.21	
v/c Ratio	0.49	0.95		0.85	0.56	0.32	0.15	0.58		1.00	0.25	
Control Delay	41.3	69.2		71.5	31.8	7.4	39.3	26.9		133.9	18.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	41.3	69.2		71.5	31.8	7.4	39.3	26.9		133.9	18.2	
LOS	D	E		E	C	A	D	C		F	B	
Approach Delay		63.9			30.9			28.5			82.7	
Approach LOS		E			C			C			F	
Queue Length 50th (ft)	77	392		65	254	25	23	90		87	19	
Queue Length 95th (ft)	142	#615		#123	359	81	38	180		#209	65	
Internal Link Dist (ft)		458			869			544			128	
Turn Bay Length (ft)	145			125		210	85			105		
Base Capacity (vph)	250	546		143	665	698	243	438		112	356	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.49	0.95		0.85	0.56	0.32	0.15	0.58		1.00	0.25	

Intersection Summary

Area Type: CBD
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 114 (95%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.00
 Intersection Signal Delay: 47.6
 Intersection Capacity Utilization 69.8%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service C
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 8: Dreher Ave/School Drive & Main Street



Lane Group	ø9
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	25.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings
9: 9th St & Main Street

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	375	14	1	229	133	29	56	49	256	6	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	11	11	12	11	11	11	10	10	10
Grade (%)		4%			1%			5%			-2%	
Storage Length (ft)	0		0	0		0	0		0	135		0
Storage Lanes	0		0	0		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.989				0.850		0.955			0.875	
Flt Protected		0.986			0.999			0.986		0.950		
Satd. Flow (prot)	0	2759	0	0	1551	1276	0	1508	0	1487	1410	0
Flt Permitted		0.706			0.993			0.899		0.585		
Satd. Flow (perm)	0	1976	0	0	1542	1276	0	1375	0	916	1410	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			35	
Link Distance (ft)		352			552			437			1438	
Travel Time (s)		7.9			5.2			11.9			4.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.94	0.32	0.25	0.87	0.79	0.56	0.82	0.82	0.96	0.50	0.68
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	3%	0%	0%	6%	2%	0%	0%	2%	3%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)		0	0			0						
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	169	399	44	4	263	168	52	68	60	267	12	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	612	0	0	267	168	0	180	0	267	72	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	9.5	14.5		14.5	14.5	14.5	13.0	13.0		13.0	13.0	
Total Split (s)	9.5	46.0		36.5	36.5	36.5	50.0	50.0		50.0	50.0	
Total Split (%)	7.9%	38.3%		30.4%	30.4%	30.4%	41.7%	41.7%		41.7%	41.7%	
Maximum Green (s)	5.0	41.5		32.0	32.0	32.0	44.0	44.0		44.0	44.0	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-0.5			-0.5	-0.5		-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0			4.0	4.0		4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	

Lane Group ø9

Lane Configurations

Volume (vph)

Ideal Flow (vphpl)

Lane Width (ft)

Grade (%)

Storage Length (ft)

Storage Lanes

Taper Length (ft)

Lane Util. Factor

Ped Bike Factor

Frt

Flt Protected

Satd. Flow (prot)

Flt Permitted

Satd. Flow (perm)

Right Turn on Red

Satd. Flow (RTOR)

Link Speed (mph)

Link Distance (ft)

Travel Time (s)

Confl. Peds. (#/hr)

Confl. Bikes (#/hr)

Peak Hour Factor

Growth Factor

Heavy Vehicles (%)

Bus Blockages (#/hr)

Parking (#/hr)

Mid-Block Traffic (%)

Adj. Flow (vph)

Shared Lane Traffic (%)

Lane Group Flow (vph)

Turn Type

Protected Phases 9

Permitted Phases

Detector Phase

Switch Phase

Minimum Initial (s) 1.0

Minimum Split (s) 24.0

Total Split (s) 24.0

Total Split (%) 20%

Maximum Green (s) 22.0

Yellow Time (s) 2.0

All-Red Time (s) 0.0

Lost Time Adjust (s)

Total Lost Time (s)

Lead/Lag

Lead-Lag Optimize?

Vehicle Extension (s) 3.0

Minimum Gap (s) 3.0

Lanes, Volumes, Timings
9: 9th St & Main Street

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

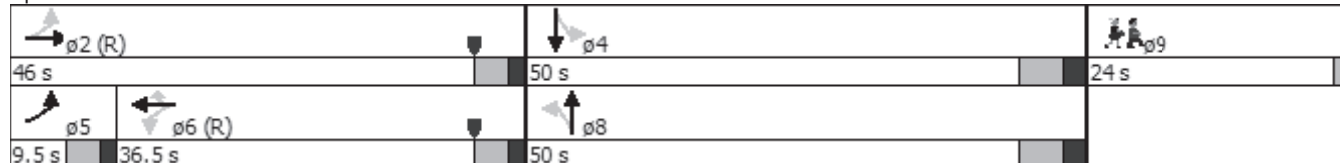
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		48.4		48.4	48.4		39.6			39.6	39.6	
Actuated g/C Ratio		0.40		0.40	0.40		0.33			0.33	0.33	
v/c Ratio		0.77		0.43	0.33		0.40			0.88	0.15	
Control Delay		20.3		26.0	24.9		32.4			66.7	27.0	
Queue Delay		0.0		0.0	0.0		0.0			0.0	0.0	
Total Delay		20.3		26.0	24.9		32.4			66.7	27.0	
LOS		C		C	C		C			E	C	
Approach Delay		20.3		25.5			32.4				58.3	
Approach LOS		C		C			C				E	
Queue Length 50th (ft)		189		144	90		104			188	38	
Queue Length 95th (ft)		m248		186	115		142			#318	37	
Internal Link Dist (ft)		272		472			357				1358	
Turn Bay Length (ft)										135		
Base Capacity (vph)		796		621	514		527			351	540	
Starvation Cap Reductn		0		0	0		0			0	0	
Spillback Cap Reductn		0		0	0		0			0	0	
Storage Cap Reductn		0		0	0		0			0	0	
Reduced v/c Ratio		0.77		0.43	0.33		0.34			0.76	0.13	

Intersection Summary

Area Type: CBD
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 42 (35%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 31.4
 Intersection Capacity Utilization 62.7%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service B

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: 9th St & Main Street



















Lane Group	ø9
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	Ped
Walk Time (s)	8.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings
10: 8th St & Main Street/Main Street

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	577	39	8	292	14	65	47	40	56	19	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	13	13	13	10	10	10	10	10	10
Grade (%)		0%			0%			1%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.987			0.992			0.964			0.954	
Flt Protected		0.996			0.998			0.981			0.978	
Satd. Flow (prot)	0	*3502	0	0	*1772	0	0	*1760	0	0	*1624	0
Flt Permitted		0.877			0.961			0.820			0.739	
Satd. Flow (perm)	0	*3021	0	0	*1733	0	0	*1405	0	0	*1397	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		552			555			340			310	
Travel Time (s)		8.5			8.2			9.3			8.5	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.66	0.89	0.57	0.50	0.81	0.58	0.86	0.69	0.77	0.88	0.68	0.83
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	2%	0%	0%	3%	0%	2%	0%	5%	2%	0%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)		0	0	0	0	0	0	0	0			
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	68	648	68	16	360	24	76	68	52	64	28	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	784	0	0	400	0	0	196	0	0	140	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.5	14.5		14.5	14.5		12.5	12.5		12.5	12.5	
Total Split (s)	22.5	22.5		22.5	22.5		15.5	15.5		15.5	15.5	
Total Split (%)	37.5%	37.5%		37.5%	37.5%		25.8%	25.8%		25.8%	25.8%	
Maximum Green (s)	18.0	18.0		18.0	18.0		10.0	10.0		10.0	10.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)		-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)		2.5			2.5			3.5			3.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	37%
Maximum Green (s)	20.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Minimum Gap (s)	3.0

Lanes, Volumes, Timings
10: 8th St & Main Street/Main Street

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

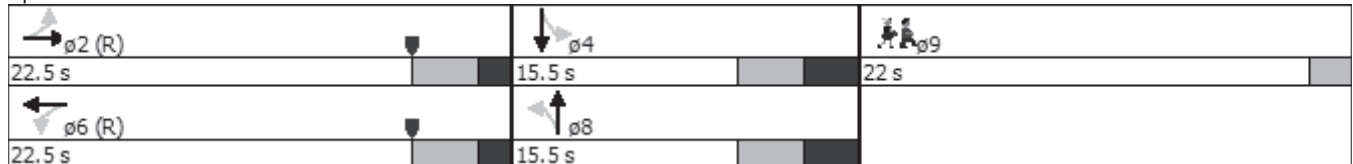
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		22.3			22.3			11.7			11.7	
Actuated g/C Ratio		0.37			0.37			0.20			0.20	
v/c Ratio		0.70			0.62			0.72			0.52	
Control Delay		16.2			14.7			40.0			29.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		16.2			14.7			40.0			29.1	
LOS		B			B			D			C	
Approach Delay		16.2			14.7			40.0			29.1	
Approach LOS		B			B			D			C	
Queue Length 50th (ft)		148			121			66			45	
Queue Length 95th (ft)		204			144			92			67	
Internal Link Dist (ft)		472			475			260			230	
Turn Bay Length (ft)												
Base Capacity (vph)		1124			645			281			279	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.70			0.62			0.70			0.50	

Intersection Summary

Area Type: CBD
 Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 36 (60%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.72
 Intersection Signal Delay: 20.1
 Intersection Capacity Utilization 57.7%
 Analysis Period (min) 15
 * User Entered Value

Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 10: 8th St & Main Street/Main Street



Lane Group	ø9
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

















HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings

Stroudsburg Boro. A.M. Peak Hour With Peds

11: Seventh St/7th St & Main Street /Main Street

Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	352	108	18	227	13	64	43	56	37	66	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	13	13	13	14	14	14	11	11	11
Grade (%)		-1%			2%			4%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.966			0.991			0.954			0.974	
Flt Protected		0.997			0.995			0.981			0.983	
Satd. Flow (prot)	0	2748	0	0	1478	0	0	1604	0	0	1432	0
Flt Permitted		0.925			0.926			0.738			0.777	
Satd. Flow (perm)	0	2549	0	0	1375	0	0	1207	0	0	1132	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		555			308			456			331	
Travel Time (s)		15.1			8.4			12.4			9.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.61	0.88	0.87	0.64	0.87	0.65	0.80	0.72	0.78	0.54	0.69	0.78
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	6%	6%	2%	0%	6%	0%	5%	0%	7%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)		0	0	0	0	0				0	0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	28	400	124	28	261	20	80	60	72	69	96	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	552	0	0	309	0	0	212	0	0	205	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	15.0		15.0	15.0		12.0	12.0		12.0	12.0	
Total Split (s)	55.0	55.0		55.0	55.0		43.0	43.0		43.0	43.0	
Total Split (%)	45.8%	45.8%		45.8%	45.8%		35.8%	35.8%		35.8%	35.8%	
Maximum Green (s)	50.0	50.0		50.0	50.0		38.0	38.0		38.0	38.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)		3.0			3.0			3.0			3.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	18%
Maximum Green (s)	20.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Minimum Gap (s)	3.0

Lanes, Volumes, Timings

Stroudsburg Boro. A.M. Peak Hour With Peds

11: Seventh St/7th St & Main Street /Main Street

Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		64.2			64.2			27.8			27.8	
Actuated g/C Ratio		0.54			0.54			0.23			0.23	
v/c Ratio		0.40			0.42			0.76			0.79	
Control Delay		12.9			9.6			48.7			62.9	
Queue Delay		0.0			0.4			0.0			0.0	
Total Delay		12.9			10.0			48.7			62.9	
LOS		B			A			D			E	
Approach Delay		12.9			10.0			48.7			62.9	
Approach LOS		B			A			D			E	
Queue Length 50th (ft)		121			38			112			150	
Queue Length 95th (ft)		152			60			124			153	
Internal Link Dist (ft)		475			228			376			251	
Turn Bay Length (ft)												
Base Capacity (vph)		1364			736			402			377	
Starvation Cap Reductn		0			127			0			0	
Spillback Cap Reductn		7			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.41			0.51			0.53			0.54	

Intersection Summary

Area Type: CBD
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 26.1
 Intersection Capacity Utilization 53.2%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service A

Splits and Phases: 11: Seventh St/7th St & Main Street /Main Street

ø2 (R) 55 s				ø4 43 s				ø9 22 s			
ø6 (R) 55 s				ø8 43 s							

Lane Group	ø9
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	Ped
Walk Time (s)	9.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings
12: Seventh St & Ann St

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	13	133	21	155	227	0	0	189	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	16	16	16	16	16	16	10	10	10
Grade (%)		0%			2%			-5%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.981						0.974	
Flt Protected					0.995			0.981				
Satd. Flow (prot)	0	0	0	0	1783	0	0	2131	0	0	1530	0
Flt Permitted					0.995			0.678				
Satd. Flow (perm)	0	0	0	0	1783	0	0	1473	0	0	1530	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)					15						23	
Link Speed (mph)		25			25			35			25	
Link Distance (ft)		273			284			513			456	
Travel Time (s)		7.4			7.7			10.0			12.4	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.65	0.90	0.75	0.95	0.92	0.92	0.92	0.76	0.70
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	15%	2%	14%	1%	2%	0%	0%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)				0	0	0					0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	0	0	20	148	28	163	247	0	0	249	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	196	0	0	410	0	0	309	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					6		3	8			4	
Permitted Phases				6			8					
Detector Phase				6	6		3	8			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	7.0			7.0	
Minimum Split (s)				23.0	23.0		10.5	20.5			20.5	
Total Split (s)				23.5	23.5		10.5	36.5			26.0	
Total Split (%)				39.2%	39.2%		17.5%	60.8%			43.3%	
Maximum Green (s)				18.5	18.5		5.0	31.0			20.5	
Yellow Time (s)				3.5	3.5		4.0	4.0			4.0	
All-Red Time (s)				1.5	1.5		1.5	1.5			1.5	
Lost Time Adjust (s)					-1.0			-1.0			-1.0	
Total Lost Time (s)					4.0			4.5			4.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Minimum Gap (s)				3.0	3.0		3.0	3.0			3.0	

Lanes, Volumes, Timings
12: Seventh St & Ann St

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

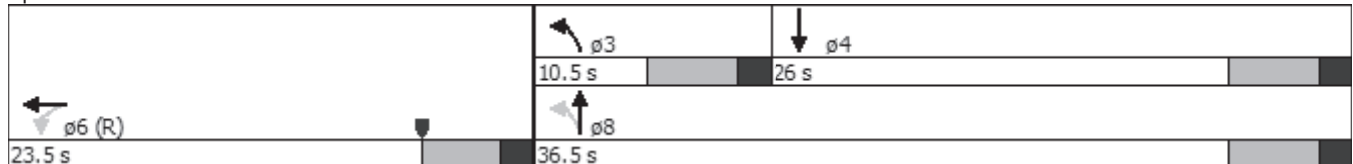
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)				0.0	0.0		0.0	0.0			0.0	
Time To Reduce (s)				0.0	0.0		0.0	0.0			0.0	
Recall Mode				C-Max	C-Max		None	None			None	
Walk Time (s)				7.0	7.0			7.0			7.0	
Flash Dont Walk (s)				11.0	11.0			8.0			8.0	
Pedestrian Calls (#/hr)				8	8			1			3	
Act Effct Green (s)					25.8			25.7			25.7	
Actuated g/C Ratio					0.43			0.43			0.43	
v/c Ratio					0.25			0.65			0.46	
Control Delay					13.2			17.9			11.1	
Queue Delay					0.0			0.0			0.0	
Total Delay					13.2			17.9			11.1	
LOS					B			B			B	
Approach Delay					13.2			17.9			11.1	
Approach LOS					B			B			B	
Queue Length 50th (ft)					41			108			61	
Queue Length 95th (ft)					94			155			76	
Internal Link Dist (ft)		193			204			433			376	
Turn Bay Length (ft)												
Base Capacity (vph)					775			785			692	
Starvation Cap Reductn					0			0			0	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.25			0.52			0.45	

Intersection Summary

Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 6:WBTL, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.65
 Intersection Signal Delay: 14.6
 Intersection Capacity Utilization 52.8%
 Analysis Period (min) 15




















Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 12: Seventh St & Ann St


















HCM 2010 Signalized Intersection Summary
 12: Seventh St & Ann St

Stroudsburg Boro. A.M. Peak Hour With Peds
 Existing Year 2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	13	133	21	155	227	0	0	189	42
Number				1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj				1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00	0.90
Adj Sat Flow veh/h/ln				195.6	186.2	195.6	202.5	199.3	0.0	0.0	187.0	190.0
Lanes				0	1	0	0	1	0	0	1	0
Cap, veh/h				74	546	103	284	393	0	0	474	114
Arrive On Green				0.44	0.44	0.42	0.36	0.36	0.00	0.00	0.72	0.68
Sat Flow, veh/h				166	1228	232	469	1087	0	0	1311	316
Grp Volume(v), veh/h				196	0	0	410	0	0	0	0	309
Grp Sat Flow(s),veh/h/ln				1627	0	0	1556	0	0	0	0	1627
Q Serve(g_s), s				3.3	0.0	0.0	0.1	0.0	0.0	0.0	0.0	3.8
Cycle Q Clear(g_c), s				3.3	0.0	0.0	9.9	0.0	0.0	0.0	0.0	3.8
Prop In Lane				0.10		0.14	0.40		0.00	0.00		0.19
Lane Grp Cap(c), veh/h				724	0	0	677	0	0	0	0	588
V/C Ratio(X)				0.27	0.00	0.00	0.61	0.00	0.00	0.00	0.00	0.53
Avail Cap(c_a), veh/h				724	0	0	1244	0	0	0	0	798
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(l)				1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.52
Uniform Delay (d), s/veh				7.7	0.0	0.0	11.9	0.0	0.0	0.0	0.0	4.6
Incr Delay (d2), s/veh				0.9	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.4
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln				1.3	0.0	0.0	3.0	0.0	0.0	0.0	0.0	1.0
Lane Grp Delay (d), s/veh				8.7	0.0	0.0	12.8	0.0	0.0	0.0	0.0	4.9
Lane Grp LOS				A			B					A
Approach Vol, veh/h					196			410			309	
Approach Delay, s/veh					8.7			12.8			4.9	
Approach LOS					A			B			A	
Timer												
Assigned Phs					6		3	8				4
Phs Duration (G+Y+Rc), s					23.5		0.0	20.3			20.3	
Change Period (Y+Rc), s					5.0		5.5	5.5			5.5	
Max Green Setting (Gmax), s					18.5		5.0	31.0			20.5	
Max Q Clear Time (g_c+l1), s					5.3		0.0	11.9			5.8	
Green Ext Time (p_c), s					0.4		0.0	2.9			2.7	
Intersection Summary												
HCM 2010 Ctrl Delay					9.3							
HCM 2010 LOS					A							
Notes												

Lanes, Volumes, Timings
13: 6th St & Main Street

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	104	504	14	8	244	45	10	69	36	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	16	16	16	11	11	11	12	12	12
Grade (%)		-1%			2%			-1%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995			0.977			0.957				
Flt Protected		0.989			0.998			0.996				
Satd. Flow (prot)	0	2867	0	0	1619	0	0	1569	0	0	0	0
Flt Permitted		0.752			0.973			0.996				
Satd. Flow (perm)	0	2180	0	0	1579	0	0	1569	0	0	0	0
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)		5			14							35
Link Speed (mph)		35			35			35				35
Link Distance (ft)		308			744			383				229
Travel Time (s)		6.0			14.5			7.5				4.5
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.70	0.96	0.58	0.67	0.86	0.75	0.63	0.66	0.64	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	3%	7%	0%	5%	0%	0%	0%	3%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)		0	0	0	0	0						
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	149	525	24	12	284	60	16	105	56	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	698	0	0	356	0	0	177	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA				
Protected Phases		2			6			4				
Permitted Phases	2			6			4					
Detector Phase	2	2		6	6		4	4				
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0				
Minimum Split (s)	15.0	15.0		15.0	15.0		12.0	12.0				
Total Split (s)	70.0	70.0		70.0	70.0		31.0	31.0				
Total Split (%)	58.3%	58.3%		58.3%	58.3%		25.8%	25.8%				
Maximum Green (s)	65.0	65.0		65.0	65.0		26.0	26.0				
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5				
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5				
Lost Time Adjust (s)		-1.0			-1.0			-1.0				
Total Lost Time (s)		4.0			4.0			4.0				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0				
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0				

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	19.0
Total Split (s)	19.0
Total Split (%)	16%
Maximum Green (s)	17.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Minimum Gap (s)	3.0

Lanes, Volumes, Timings
13: 6th St & Main Street

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None				
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		73.3			73.3			19.7				
Actuated g/C Ratio		0.61			0.61			0.16				
v/c Ratio		0.52			0.37			0.69				
Control Delay		12.2			11.3			60.4				
Queue Delay		0.2			0.0			0.0				
Total Delay		12.4			11.3			60.4				
LOS		B			B			E				
Approach Delay		12.4			11.3			60.4				
Approach LOS		B			B			E				
Queue Length 50th (ft)		94			118			131				
Queue Length 95th (ft)		120			130			136				
Internal Link Dist (ft)		228			664			303			149	
Turn Bay Length (ft)												
Base Capacity (vph)		1332			969			353				
Starvation Cap Reductn		153			0			0				
Spillback Cap Reductn		0			14			0				
Storage Cap Reductn		0			0			0				
Reduced v/c Ratio		0.59			0.37			0.50				

Intersection Summary

Area Type: CBD
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 5 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.69
 Intersection Signal Delay: 19.0
 Intersection Capacity Utilization 54.2%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 13: 6th St & Main Street



Lane Group	ø9
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	10.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings
14: Ann St & Broad St/5th St & Main Street

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

	→	↘	↙	↗	↘	↓	↗	ø9
Lane Group	EBT	EBR	NBL2	NBR	SBL	SBT	SBR2	
Lane Configurations	↑↑		↘	↗	↘	↑	↗	
Volume (vph)	337	27	173	440	87	376	263	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	11	10	11	10	10	11	
Grade (%)	-5%					2%		
Storage Length (ft)		0		0	0			
Storage Lanes		0		1	1			
Taper Length (ft)					25			
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor								
Frt	0.986			0.850			0.850	
Flt Protected			0.950		0.950			
Satd. Flow (prot)	*3372	0	1494	1371	*1752	*1793	1337	
Flt Permitted			0.275		0.950			
Satd. Flow (perm)	*3372	0	432	1371	*1752	*1792	1337	
Right Turn on Red				No	No		Yes	
Satd. Flow (RTOR)							325	
Link Speed (mph)	25					25		
Link Distance (ft)	744					298		
Travel Time (s)	20.3					8.2		
Confl. Peds. (#/hr)								
Confl. Bikes (#/hr)								
Peak Hour Factor	0.87	0.68	0.80	0.92	0.64	0.88	0.81	
Growth Factor	100%	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	2%	0%	2%	3%	2%	5%	4%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	
Parking (#/hr)								
Mid-Block Traffic (%)	0%					0%		
Adj. Flow (vph)	387	40	216	478	136	427	325	
Shared Lane Traffic (%)								
Lane Group Flow (vph)	427	0	216	478	136	427	325	
Turn Type	NA		custom	custom	pm+pt	NA	custom	
Protected Phases	8		1	6	5	2		9
Permitted Phases			6		2		2 8	
Detector Phase	8		1	6	5	2	2 8	
Switch Phase								
Minimum Initial (s)	7.0		5.0	10.0	5.0	10.0		1.0
Minimum Split (s)	14.0		12.5	16.5	11.5	16.5		22.0
Total Split (s)	25.0		23.5	61.5	11.5	49.5		22.0
Total Split (%)	20.8%		19.6%	51.3%	9.6%	41.3%		18%
Maximum Green (s)	18.0		17.0	55.0	5.0	43.0		20.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0		2.0
All-Red Time (s)	3.0		2.5	2.5	2.5	2.5		0.0
Lost Time Adjust (s)	-2.5		0.0	-2.5	-2.5	-2.5		
Total Lost Time (s)	4.5		6.5	4.0	4.0	4.0		
Lead/Lag			Lead	Lag	Lead	Lag		
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		3.0
Minimum Gap (s)	3.0		3.0	3.0	3.0	3.0		3.0

Lanes, Volumes, Timings
 14: Ann St & Broad St/5th St & Main Street

Stroudsburg Boro. A.M. Peak Hour With Peds
 Existing Year 2013

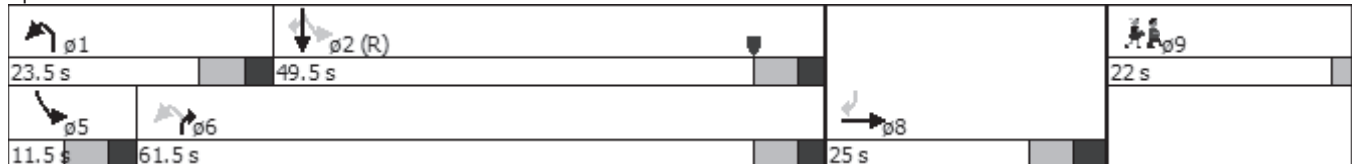
	→	↘	↙	↗	↘	↓	↙	∅9
Lane Group	EBT	EBR	NBL2	NBR	SBL	SBT	SBR2	∅9
Time Before Reduce (s)	0.0		0.0	0.0	0.0	0.0		0.0
Time To Reduce (s)	0.0		0.0	0.0	0.0	0.0		0.0
Recall Mode	None		None	None	None	C-Max		Ped
Walk Time (s)								7.0
Flash Dont Walk (s)								13.0
Pedestrian Calls (#/hr)								15
Act Effct Green (s)	20.0		66.3	57.6	56.9	49.0	71.0	
Actuated g/C Ratio	0.17		0.55	0.48	0.47	0.41	0.59	
v/c Ratio	0.76		0.60	0.73	0.16	0.58	0.35	
Control Delay	43.6		21.2	32.8	12.1	30.7	4.1	
Queue Delay	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	43.6		21.2	32.8	12.1	30.7	4.1	
LOS	D		C	C	B	C	A	
Approach Delay	43.6					18.1		
Approach LOS	D					B		
Queue Length 50th (ft)	144		83	288	48	246	13	
Queue Length 95th (ft)	206		113	429	49	327	42	
Internal Link Dist (ft)	664					218		
Turn Bay Length (ft)			190					
Base Capacity (vph)	576		391	658	830	732	927	
Starvation Cap Reductn	0		0	0	0	0	0	
Spillback Cap Reductn	0		0	0	0	0	0	
Storage Cap Reductn	0		0	0	0	0	0	
Reduced v/c Ratio	0.74		0.55	0.73	0.16	0.58	0.35	

Intersection Summary

Area Type: CBD
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 105 (88%), Referenced to phase 2:SBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.76
 Intersection Signal Delay: 27.4
 Intersection Capacity Utilization 57.3%
 Analysis Period (min) 15
 * User Entered Value

Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 14: Ann St & Broad St/5th St & Main Street



















HCM 2010 methodology does not support more than 4 approaches.

Lanes, Volumes, Timings
20: McConnell St & 4th St

Stroudsburg Boro. A.M. Peak Hour With Peds

Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	18	8	88	1	0	0	0	0	62	529	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	14	14	14	12	12	12	14	14	14
Grade (%)		1%			-1%			0%			1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor												
Frt		0.939										
Flt Protected					0.953						0.994	
Satd. Flow (prot)	0	*862	0	*619	1665	0	0	0	0	0	*1459	0
Flt Permitted					0.696						0.994	
Satd. Flow (perm)	0	*862	0	*606	1216	0	0	0	0	0	*1459	0
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)		20										
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		163			256			357			512	
Travel Time (s)		4.4			7.0			7.6			14.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.75	0.40	0.82	0.92	0.92	0.92	0.92	0.92	0.74	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	24	20	107	1	0	0	0	0	84	575	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	44	0	0	108	0	0	0	0	0	659	0
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		7.0		7.0	7.0					10.0	10.0	
Minimum Split (s)		22.0		22.0	22.0					21.0	21.0	
Total Split (s)		22.0		22.0	22.0					38.0	38.0	
Total Split (%)		36.7%		36.7%	36.7%					63.3%	63.3%	
Maximum Green (s)		17.0		17.0	17.0					33.0	33.0	
Yellow Time (s)		3.5		3.5	3.5					3.5	3.5	
All-Red Time (s)		1.5		1.5	1.5					1.5	1.5	
Lost Time Adjust (s)		-1.0			0.0						-1.0	
Total Lost Time (s)		4.0			5.0						4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	
Minimum Gap (s)		3.0		3.0	3.0					3.0	3.0	

Lanes, Volumes, Timings
20: McConnell St & 4th St

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)		0.0		0.0	0.0					0.0	0.0	
Time To Reduce (s)		0.0		0.0	0.0					0.0	0.0	
Recall Mode		None		None	None					C-Max	C-Max	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		10.0		10.0	10.0					9.0	9.0	
Pedestrian Calls (#/hr)		8		1	1					8	8	
Act Effct Green (s)		12.2			11.2							43.0
Actuated g/C Ratio		0.20			0.19							0.72
v/c Ratio		0.23			0.48							0.63
Control Delay		15.0			27.8							7.4
Queue Delay		0.0			0.0							0.0
Total Delay		15.0			27.8							7.4
LOS		B			C							A
Approach Delay		15.0			27.8							7.4
Approach LOS		B			C							A
Queue Length 50th (ft)		7			36							10
Queue Length 95th (ft)		21			67							#185
Internal Link Dist (ft)		83			176			277				432
Turn Bay Length (ft)												
Base Capacity (vph)		272			344							1046
Starvation Cap Reductn		0			0							0
Spillback Cap Reductn		0			0							0
Storage Cap Reductn		0			0							0
Reduced v/c Ratio		0.16			0.31							0.63

Intersection Summary

















Area Type: CBD
 Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 31 (52%), Referenced to phase 6:SBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.63
 Intersection Signal Delay: 10.5
 Intersection Capacity Utilization 37.9%
 Analysis Period (min) 15
 * User Entered Value
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 20: McConnell St & 4th St





















HCM 2010 Signalized Intersection Summary
 20: McConnell St & 4th St

Stroudsburg Boro. A.M. Peak Hour With Peds
 Existing Year 2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											 	
Volume (veh/h)	0	18	8	88	1	0	0	0	0	62	529	0
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	177.0	177.0	178.7	170.3	0.0				177.0	172.4	0.0
Lanes	0	1	0	0	1	0				0	2	0
Cap, veh/h	0	137	115	284	2	0				286	2062	0
Arrive On Green	0.00	0.15	0.13	0.15	0.13	0.00				0.68	0.68	0.00
Sat Flow, veh/h	0	894	745	1043	14	0				417	3011	0
Grp Volume(v), veh/h	0	0	44	108	0	0				343	316	0
Grp Sat Flow(s),veh/h/ln	0	0	1638	1057	0	0				1704	1724	0
Q Serve(g_s), s	0.0	0.0	1.2	4.1	0.0	0.0				3.9	3.5	0.0
Cycle Q Clear(g_c), s	0.0	0.0	1.2	5.2	0.0	0.0				3.9	3.5	0.0
Prop In Lane	0.00		0.45	0.99		0.00				0.24		0.00
Lane Grp Cap(c), veh/h	0	0	252	307	0	0				1167	1181	0
V/C Ratio(X)	0.00	0.00	0.17	0.35	0.00	0.00				0.29	0.27	0.00
Avail Cap(c_a), veh/h	0	0	594	567	0	0				1167	1181	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	0.00				1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	18.5	21.0	0.0	0.0				3.1	3.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.3	0.7	0.0	0.0				0.6	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.0	0.0	0.5	1.2	0.0	0.0				1.3	1.1	0.0
Lane Grp Delay (d), s/veh	0.0	0.0	18.8	21.6	0.0	0.0				3.7	3.6	0.0
Lane Grp LOS			B	C						A	A	
Approach Vol, veh/h		44			108						659	
Approach Delay, s/veh		18.8			21.6						3.7	
Approach LOS		B			C						A	
Timer												
Assigned Phs		4			8						6	
Phs Duration (G+Y+Rc), s		11.6			11.6						38.0	
Change Period (Y+Rc), s		5.0			5.0						5.0	
Max Green Setting (Gmax), s		17.0			17.0						33.0	
Max Q Clear Time (g_c+I1), s		3.2			7.2						0.0	
Green Ext Time (p_c), s		0.4			0.3						0.0	
Intersection Summary												
HCM 2010 Ctrl Delay			6.9									
HCM 2010 LOS			A									
Notes												

Lanes, Volumes, Timings
21: McConnell St & 3rd St

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											  	
Volume (vph)	0	64	49	13	92	0	0	0	0	4	662	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	12	12	12	13	11	14
Grade (%)		1%			-2%			0%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		175
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor												
Frt		0.935										0.850
Flt Protected					0.992						0.999	
Satd. Flow (prot)	0	*1762	0	0	*1857	0	0	0	0	0	*1931	1513
Flt Permitted					0.932						0.999	
Satd. Flow (perm)	0	*1762	0	0	*1857	0	0	0	0	0	*1931	1513
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)		64										88
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		348			248			268			452	
Travel Time (s)		9.5			6.8			7.3			7.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.94	0.77	0.65	0.92	0.92	0.92	0.92	0.92	0.33	0.86	0.81
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	6%	2%	8%	3%	0%	0%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	68	64	20	100	0	0	0	0	12	770	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	132	0	0	120	0	0	0	0	0	782	88
Turn Type		NA		Perm	NA					Perm	NA	Perm
Protected Phases		4			8						6	
Permitted Phases				8						6		6
Detector Phase		4		8	8					6	6	6
Switch Phase												
Minimum Initial (s)		7.0		7.0	7.0					10.0	10.0	10.0
Minimum Split (s)		28.0		28.0	28.0					21.0	21.0	21.0
Total Split (s)		28.0		28.0	28.0					32.0	32.0	32.0
Total Split (%)		46.7%		46.7%	46.7%					53.3%	53.3%	53.3%
Maximum Green (s)		23.0		23.0	23.0					27.0	27.0	27.0
Yellow Time (s)		3.0		3.0	3.0					3.5	3.5	3.5
All-Red Time (s)		2.0		2.0	2.0					1.5	1.5	1.5
Lost Time Adjust (s)		-1.0			-1.0						-1.0	-1.0
Total Lost Time (s)		4.0			4.0						4.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	3.0
Minimum Gap (s)		3.0		3.0	3.0					3.0	3.0	3.0

Lanes, Volumes, Timings
21: McConnell St & 3rd St

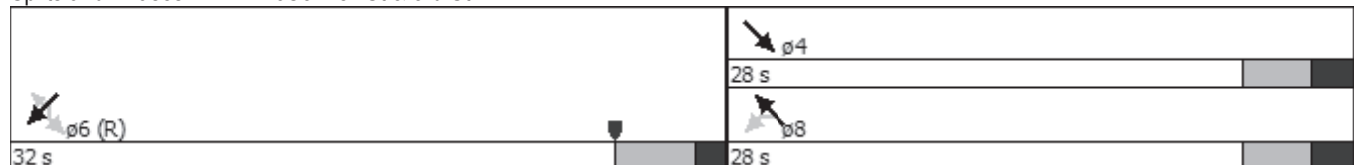
Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Time Before Reduce (s)		0.0		0.0	0.0					0.0	0.0	0.0
Time To Reduce (s)		0.0		0.0	0.0					0.0	0.0	0.0
Recall Mode		None		None	None					C-Max	C-Max	C-Max
Walk Time (s)		9.0		9.0	9.0					7.0	7.0	7.0
Flash Dont Walk (s)		14.0		14.0	14.0					9.0	9.0	9.0
Pedestrian Calls (#/hr)		5		5	5					1	1	1
Act Effct Green (s)		12.5			12.5						42.7	42.7
Actuated g/C Ratio		0.21			0.21						0.71	0.71
v/c Ratio		0.32			0.31						0.57	0.08
Control Delay		11.9			20.3						10.7	2.3
Queue Delay		0.0			0.0						0.0	0.0
Total Delay		11.9			20.3						10.7	2.3
LOS		B			C						B	A
Approach Delay		11.9			20.3						9.9	
Approach LOS		B			C						A	
Queue Length 50th (ft)		22			39						58	0
Queue Length 95th (ft)		43			56						#216	15
Internal Link Dist (ft)		268			168			188			372	
Turn Bay Length (ft)												175
Base Capacity (vph)		743			742						1373	1101
Starvation Cap Reductn		0			0						0	0
Spillback Cap Reductn		0			0						0	0
Storage Cap Reductn		0			0						0	0
Reduced v/c Ratio		0.18			0.16						0.57	0.08

Intersection Summary


















Area Type: CBD
 Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 13 (22%), Referenced to phase 6:SWTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.57
 Intersection Signal Delay: 11.2
 Intersection Capacity Utilization 40.0%
 Analysis Period (min) 15
 * User Entered Value
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 21: McConnell St & 3rd St




















HCM 2010 Signalized Intersection Summary
 21: McConnell St & 3rd St

Stroudsburg Boro. A.M. Peak Hour With Peds
 Existing Year 2013

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											 	
Volume (veh/h)	0	64	49	13	92	0	0	0	0	4	662	71
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	170.1	170.1	172.7	164.5	0.0				178.7	166.9	173.5
Lanes	0	1	0	0	1	0				0	2	1
Cap, veh/h	0	142	133	121	227	0				31	2108	946
Arrive On Green	0.00	0.18	0.15	0.18	0.18	0.00				0.64	0.64	0.64
Sat Flow, veh/h	0	807	760	143	1293	0				49	3287	1475
Grp Volume(v), veh/h	0	0	132	120	0	0				409	373	88
Grp Sat Flow(s),veh/h/ln	0	0	1567	1436	0	0				1667	1669	1475
Q Serve(g_s), s	0.0	0.0	3.3	0.2	0.0	0.0				5.1	4.5	1.0
Cycle Q Clear(g_c), s	0.0	0.0	3.3	3.5	0.0	0.0				5.1	4.5	1.0
Prop In Lane	0.00		0.48	0.17		0.00				0.03		1.00
Lane Grp Cap(c), veh/h	0	0	275	348	0	0				1069	1070	946
V/C Ratio(X)	0.00	0.00	0.48	0.34	0.00	0.00				0.38	0.35	0.09
Avail Cap(c_a), veh/h	0	0	861	917	0	0				1069	1070	946
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	16.4	16.0	0.0	0.0				3.7	3.6	3.0
Incr Delay (d2), s/veh	0.0	0.0	1.3	0.6	0.0	0.0				1.0	0.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.0	0.0	1.3	1.1	0.0	0.0				1.6	1.4	0.3
Lane Grp Delay (d), s/veh	0.0	0.0	17.7	16.6	0.0	0.0				4.8	4.5	3.2
Lane Grp LOS			B	B						A	A	A
Approach Vol, veh/h		132			120						870	
Approach Delay, s/veh		17.7			16.6						4.5	
Approach LOS		B			B						A	
Timer												
Assigned Phs		4			8						6	
Phs Duration (G+Y+Rc), s		11.7			11.7						32.0	
Change Period (Y+Rc), s		5.0			5.0						5.0	
Max Green Setting (Gmax), s		23.0			23.0						27.0	
Max Q Clear Time (g_c+I1), s		5.3			5.5						7.1	
Green Ext Time (p_c), s		0.8			0.8						2.2	
Intersection Summary												
HCM 2010 Ctrl Delay			7.4									
HCM 2010 LOS			A									
Notes												

Lanes, Volumes, Timings
24: 5th St & Sarah St

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	62	34	72	2	243	99	27	53	1	18	241	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	12	12	12	11	11	11	16	16	16
Grade (%)		-6%			7%			14%			-10%	
Storage Length (ft)	0		0	0		150	0		0	0		0
Storage Lanes	0		0	0		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.939				0.850		0.999			0.965	
Flt Protected		0.984			0.999			0.985			0.997	
Satd. Flow (prot)	0	1660	0	0	1632	1389	0	1492	0	0	1894	0
Flt Permitted		0.807			0.996			0.827			0.974	
Satd. Flow (perm)	0	1361	0	0	1627	1389	0	1253	0	0	1850	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		92				159		1			28	
Link Speed (mph)		25			35			35			35	
Link Distance (ft)		447			479			476			360	
Travel Time (s)		12.2			9.3			9.3			7.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.77	0.78	0.50	0.75	0.64	0.96	0.83	0.92	0.56	0.74	0.75
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	1%	1%	0%	2%	0%	0%	5%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)	0	0	0									
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	68	44	92	4	324	155	28	64	1	32	326	124
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	204	0	0	328	155	0	93	0	0	482	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	10.5	28.5		28.5	28.5	28.5	26.0	26.0		26.0	26.0	
Total Split (s)	10.5	39.0		28.5	28.5	28.5	26.0	26.0		26.0	26.0	
Total Split (%)	16.2%	60.0%		43.8%	43.8%	43.8%	40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	5.0	33.5		23.0	23.0	23.0	19.0	19.0		19.0	19.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	5.0	5.0		5.0	5.0	
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.5			-1.5	-1.5		-1.5			-1.5	
Total Lost Time (s)		4.0			4.0	4.0		5.5			5.5	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	5.0	5.0		5.0	5.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	2.5	2.5		2.5	2.5	

Lanes, Volumes, Timings
24: 5th St & Sarah St

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

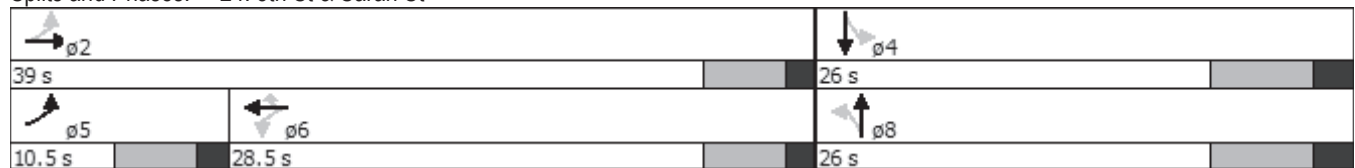
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		3.0	3.0	3.0	26.0	26.0		26.0	26.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	10.0	10.0		10.0	10.0	
Recall Mode	None	None		None	None	None	Min	Min		Min	Min	
Walk Time (s)		11.0		11.0	11.0	11.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		12.0		12.0	12.0	12.0	12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)		1		3	3	3	1	1		5	5	
Act Effct Green (s)		16.3			16.3	16.3		15.8			15.8	
Actuated g/C Ratio		0.39			0.39	0.39		0.38			0.38	
v/c Ratio		0.35			0.52	0.24		0.20			0.68	
Control Delay		7.6			13.9	3.2		10.9			16.4	
Queue Delay		0.0			0.0	0.0		0.0			0.0	
Total Delay		7.6			13.9	3.2		10.9			16.4	
LOS		A			B	A		B			B	
Approach Delay		7.6			10.5			10.9			16.4	
Approach LOS		A			B			B			B	
Queue Length 50th (ft)		17			57	0		13			79	
Queue Length 95th (ft)		42			97	8		42			152	
Internal Link Dist (ft)		367			399			396			280	
Turn Bay Length (ft)						150						
Base Capacity (vph)		1158			989	906		637			955	
Starvation Cap Reductn		0			0	0		0			0	
Spillback Cap Reductn		0			0	0		0			0	
Storage Cap Reductn		0			0	0		0			0	
Reduced v/c Ratio		0.18			0.33	0.17		0.15			0.50	

Intersection Summary

Area Type: CBD
 Cycle Length: 65
 Actuated Cycle Length: 42
 Natural Cycle: 65
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.68
 Intersection Signal Delay: 12.3
 Intersection Capacity Utilization 58.3%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service B






















Splits and Phases: 24: 5th St & Sarah St



HCM 2010 analysis expects stop-line detection. Detectors can not be further than 20 feet from the stop bar.

Lanes, Volumes, Timings
8: Dreher Ave/School Drive & Main Street

Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	399	39	157	559	107	36	28	137	116	32	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	14	12	11	12	14	12	14	16	14	14	12
Grade (%)		-1%			0%			1%			1%	
Storage Length (ft)	145		0	125		210	85		0	105		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.988				0.850		0.872			0.902	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1337	1728	0	1525	1613	1397	1483	1522	0	1567	1488	0
Flt Permitted	0.320			0.195			0.669			0.389		
Satd. Flow (perm)	451	1728	0	313	1613	1397	1044	1522	0	642	1488	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				80		178			58	
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		538			949			624			208	
Travel Time (s)		10.5			18.5			12.2			5.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.86	0.92	0.91	0.92	0.92	0.81	0.92	0.77	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	18%	4%	14%	3%	6%	11%	9%	10%	3%	10%	10%	10%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	62	464	42	173	608	116	44	30	178	126	35	65
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	506	0	173	608	116	44	208	0	126	100	0
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	2	2		1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	17.0	17.0		12.0	17.0	17.0	13.0	13.0		13.0	13.0	
Total Split (s)	58.0	58.0		18.0	76.0	76.0	40.0	40.0		40.0	40.0	
Total Split (%)	38.7%	38.7%		12.0%	50.7%	50.7%	26.7%	26.7%		26.7%	26.7%	
Maximum Green (s)	51.0	51.0		11.0	69.0	69.0	34.0	34.0		34.0	34.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	0.0	-2.0	-2.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	7.0	4.0	4.0		6.0	6.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	34.0
Total Split (s)	34.0
Total Split (%)	23%
Maximum Green (s)	32.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Minimum Gap (s)	3.0

Lanes, Volumes, Timings
8: Dreher Ave/School Drive & Main Street

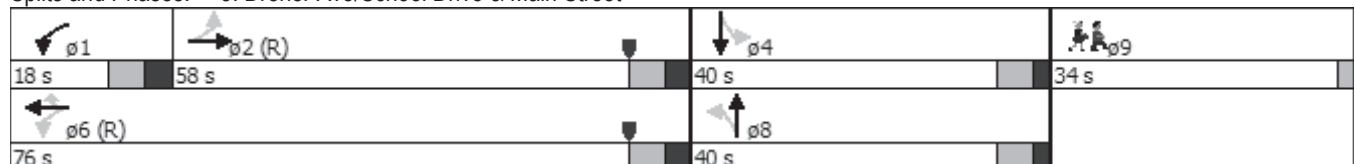
Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	C-Max	C-Max		None	C-Max	C-Max	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	56.7	56.7		75.0	75.0	73.0	32.0	32.0		30.0	30.0	
Actuated g/C Ratio	0.38	0.38		0.50	0.50	0.49	0.21	0.21		0.20	0.20	
v/c Ratio	0.36	0.77		0.66	0.75	0.16	0.20	0.45		0.98	0.29	
Control Delay	43.5	51.2		39.8	32.5	8.5	48.8	12.9		134.5	24.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	43.5	51.2		39.8	32.5	8.5	48.8	12.9		134.5	24.2	
LOS	D	D		D	C	A	D	B		F	C	
Approach Delay		50.3			30.8			19.1			85.7	
Approach LOS		D			C			B			F	
Queue Length 50th (ft)	45	449		85	340	13	34	23		120	33	
Queue Length 95th (ft)	95	565		166	438	49	64	97		#246	87	
Internal Link Dist (ft)		458			869			544			128	
Turn Bay Length (ft)	145			125		210	85			105		
Base Capacity (vph)	170	655		265	806	721	250	500		145	382	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.36	0.77		0.65	0.75	0.16	0.18	0.42		0.87	0.26	

Intersection Summary

Area Type: CBD
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 58 (39%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.98
 Intersection Signal Delay: 41.4
 Intersection Capacity Utilization 75.9%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service D
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 8: Dreher Ave/School Drive & Main Street





















Lane Group	ø9
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	25.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings
9: 9th St & Main Street

Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	177	362	7	2	306	161	43	74	63	301	8	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	11	11	12	11	11	11	10	10	10
Grade (%)		4%			1%			5%			-2%	
Storage Length (ft)	0		0	0		0	0		0	135		0
Storage Lanes	0		0	0		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.996				0.850		0.954			0.867	
Flt Protected		0.980			0.999			0.989		0.950		
Satd. Flow (prot)	0	2708	0	0	1596	1252	0	1494	0	1516	1378	0
Flt Permitted		0.596			0.993			0.919		0.504		
Satd. Flow (perm)	0	1647	0	0	1586	1252	0	1388	0	804	1378	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			35	
Link Distance (ft)		352			552			437			1438	
Travel Time (s)		7.9			5.2			11.9			4.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.57	0.85	0.35	0.50	0.81	0.77	0.77	0.64	0.72	0.91	1.00	0.55
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	9%	3%	0%	0%	3%	4%	2%	3%	0%	1%	13%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)		0	0			0						
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	311	426	20	4	378	209	56	116	88	331	8	64
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	757	0	0	382	209	0	260	0	331	72	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	9.5	14.5		14.5	14.5	14.5	13.0	13.0		13.0	13.0	
Total Split (s)	9.5	68.0		58.5	58.5	58.5	58.0	58.0		58.0	58.0	
Total Split (%)	6.3%	45.3%		39.0%	39.0%	39.0%	38.7%	38.7%		38.7%	38.7%	
Maximum Green (s)	5.0	63.5		54.0	54.0	54.0	52.0	52.0		52.0	52.0	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-0.5			-0.5	-0.5		-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0			4.0	4.0		4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	16%
Maximum Green (s)	22.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Minimum Gap (s)	3.0

Lanes, Volumes, Timings
9: 9th St & Main Street

Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		64.0		64.0	64.0		54.0			54.0	54.0	
Actuated g/C Ratio		0.43		0.43	0.43		0.36			0.36	0.36	
v/c Ratio		1.45dl		0.57	0.39		0.52			1.15	0.15	
Control Delay		83.6		31.5	28.3		42.4			141.1	33.5	
Queue Delay		0.0		1.0	0.0		0.0			0.0	0.0	
Total Delay		83.6		32.4	28.3		42.4			141.1	33.5	
LOS		F		C	C		D			F	C	
Approach Delay		83.6		31.0			42.4				121.8	
Approach LOS		F		C			D				F	
Queue Length 50th (ft)		~423		238	128		200			~378	48	
Queue Length 95th (ft)		#506		277	156		191			#579	87	
Internal Link Dist (ft)		272		472			357				1358	
Turn Bay Length (ft)										135		
Base Capacity (vph)		702		676	534		499			289	496	
Starvation Cap Reductn		0		112	0		0			0	0	
Spillback Cap Reductn		0		0	0		0			0	0	
Storage Cap Reductn		0		0	0		0			0	0	
Reduced v/c Ratio		1.08		0.68	0.39		0.52			1.15	0.15	

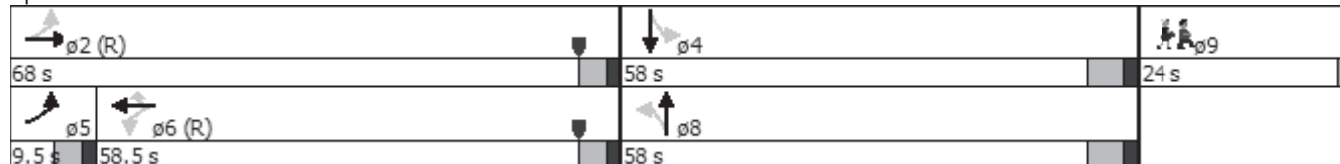
Intersection Summary

Area Type: CBD
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 62 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.15
 Intersection Signal Delay: 70.5
 Intersection Capacity Utilization 78.2%
 Analysis Period (min) 15

Intersection LOS: E
 ICU Level of Service D

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 9: 9th St & Main Street



















Lane Group	ø9
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	Ped
Walk Time (s)	8.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings
10: 8th St & Main Street/Main Street

Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	518	22	6	252	8	65	76	35	43	19	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	13	13	13	10	10	10	10	10	10
Grade (%)		0%			0%			1%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.993			0.995			0.968			0.931	
Flt Protected		0.995			0.998			0.984			0.984	
Satd. Flow (prot)	0	*3502	0	0	*1772	0	0	*1760	0	0	*1624	0
Flt Permitted		0.899			0.973			0.835			0.818	
Satd. Flow (perm)	0	*3021	0	0	*1733	0	0	*1405	0	0	*1397	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		552			555			340			310	
Travel Time (s)		8.5			8.2			9.3			8.5	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.73	0.93	0.69	0.50	0.86	0.67	0.90	0.79	0.67	0.77	0.68	0.77
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	2%	5%	0%	1%	0%	3%	0%	3%	2%	0%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)		0	0	0	0	0	0	0	0	0	0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	60	557	32	12	293	12	72	96	52	56	28	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	649	0	0	317	0	0	220	0	0	172	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.5	14.5		14.5	14.5		12.5	12.5		12.5	12.5	
Total Split (s)	27.5	27.5		27.5	27.5		25.5	25.5		25.5	25.5	
Total Split (%)	36.7%	36.7%		36.7%	36.7%		34.0%	34.0%		34.0%	34.0%	
Maximum Green (s)	23.0	23.0		23.0	23.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)		-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)		2.5			2.5			3.5			3.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	29%
Maximum Green (s)	20.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Minimum Gap (s)	3.0

Lanes, Volumes, Timings
10: 8th St & Main Street/Main Street






Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		30.9			30.9			18.1			18.1	
Actuated g/C Ratio		0.41			0.41			0.24			0.24	
v/c Ratio		0.52			0.44			0.65			0.51	
Control Delay		14.2			13.2			34.4			29.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		14.2			13.2			34.4			29.4	
LOS		B			B			C			C	
Approach Delay		14.2			13.2			34.4			29.4	
Approach LOS		B			B			C			C	
Queue Length 50th (ft)		164			79			91			68	
Queue Length 95th (ft)		m155			167			128			84	
Internal Link Dist (ft)		472			475			260			230	
Turn Bay Length (ft)												
Base Capacity (vph)		1245			714			412			409	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.52			0.44			0.53			0.42	

Intersection Summary

Area Type: CBD
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 44 (59%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.65
 Intersection Signal Delay: 19.2
 Intersection Capacity Utilization 58.6%
 Analysis Period (min) 15
 * User Entered Value
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: 8th St & Main Street/Main Street

 φ2 (R)		 φ4		 φ9
27.5 s		25.5 s		22 s
 φ6 (R)		 φ8		
27.5 s		25.5 s		

Lane Group	ø9
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings

Stroudsburg Boro. P.M. Peak Hour With Peds

11: Seventh St/7th St & Main Street /Main Street

Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	390	139	18	250	22	54	69	57	31	124	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	13	13	13	14	14	14	11	11	11
Grade (%)		-1%			2%			4%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.963			0.984			0.963			0.975	
Flt Protected		0.998			0.997			0.983			0.988	
Satd. Flow (prot)	0	2815	0	0	1532	0	0	1633	0	0	1432	0
Flt Permitted		0.922			0.938			0.680			0.801	
Satd. Flow (perm)	0	2600	0	0	1441	0	0	1130	0	0	1161	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		555			308			456			331	
Travel Time (s)		15.1			8.4			12.4			9.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.82	0.79	0.81	0.75	0.74	0.46	0.59	0.72	0.79	0.48	0.86	0.58
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	3%	1%	0%	1%	0%	4%	3%	4%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)		0	0	0	0	0				0	0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	28	494	172	24	338	48	92	96	72	65	144	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	694	0	0	410	0	0	260	0	0	257	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	15.0		15.0	15.0		12.0	12.0		12.0	12.0	
Total Split (s)	72.0	72.0		72.0	72.0		56.0	56.0		56.0	56.0	
Total Split (%)	48.0%	48.0%		48.0%	48.0%		37.3%	37.3%		37.3%	37.3%	
Maximum Green (s)	67.0	67.0		67.0	67.0		51.0	51.0		51.0	51.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)		3.0			3.0			3.0			3.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	15%
Maximum Green (s)	20.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Minimum Gap (s)	3.0

Lanes, Volumes, Timings

Stroudsburg Boro. P.M. Peak Hour With Peds

11: Seventh St/7th St & Main Street /Main Street

Existing Year 2013

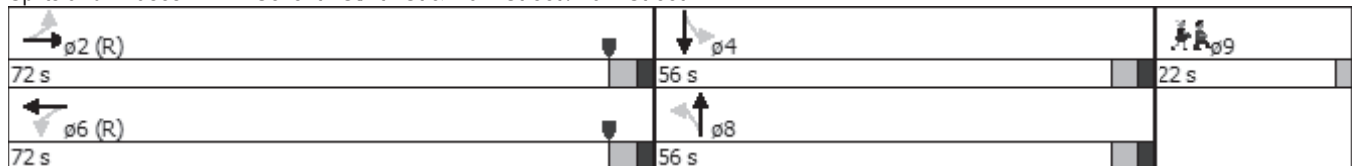
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		82.7			82.7			39.3			39.3	
Actuated g/C Ratio		0.55			0.55			0.26			0.26	
v/c Ratio		0.48			0.52			0.88			0.85	
Control Delay		14.4			17.2			62.2			75.4	
Queue Delay		0.0			0.8			0.1			0.0	
Total Delay		14.4			18.1			62.3			75.4	
LOS		B			B			E			E	
Approach Delay		14.4			18.1			62.3			75.4	
Approach LOS		B			B			E			E	
Queue Length 50th (ft)		152			151			248			239	
Queue Length 95th (ft)		166			160			224			300	
Internal Link Dist (ft)		475			228			376			251	
Turn Bay Length (ft)												
Base Capacity (vph)		1432			794			399			410	
Starvation Cap Reductn		0			159			4			0	
Spillback Cap Reductn		7			8			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.49			0.65			0.66			0.63	

Intersection Summary

Area Type: CBD
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 32.7
 Intersection Capacity Utilization 58.5%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 11: Seventh St/7th St & Main Street /Main Street



Lane Group	ø9
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	Ped
Walk Time (s)	9.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings
12: Seventh St & Ann St

Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	44	131	33	148	163	0	0	387	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	16	16	16	16	16	16	10	10	10
Grade (%)		0%			2%			-5%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.978						0.977	
Flt Protected					0.986			0.977				
Satd. Flow (prot)	0	0	0	0	1830	0	0	2124	0	0	1546	0
Flt Permitted					0.986			0.429				
Satd. Flow (perm)	0	0	0	0	1830	0	0	933	0	0	1546	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)					7						12	
Link Speed (mph)		25			25			35			25	
Link Distance (ft)		273			284			513			456	
Travel Time (s)		7.4			7.7			10.0			12.4	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.52	0.82	0.69	0.82	0.80	0.92	0.92	0.91	0.73
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	2%	1%	0%	1%	2%	0%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)				0	0	0					0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	0	0	85	160	48	180	204	0	0	425	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	293	0	0	384	0	0	513	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					6		3	8			4	
Permitted Phases				6			8					
Detector Phase				6	6		3	8			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	7.0			7.0	
Minimum Split (s)				23.0	23.0		10.5	20.5			20.5	
Total Split (s)				49.0	49.0		10.5	101.0			90.5	
Total Split (%)				32.7%	32.7%		7.0%	67.3%			60.3%	
Maximum Green (s)				44.0	44.0		5.0	95.5			85.0	
Yellow Time (s)				3.5	3.5		4.0	4.0			4.0	
All-Red Time (s)				1.5	1.5		1.5	1.5			1.5	
Lost Time Adjust (s)					-1.0			-1.0			-1.0	
Total Lost Time (s)					4.0			4.5			4.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Minimum Gap (s)				3.0	3.0		3.0	3.0			3.0	

Lanes, Volumes, Timings
12: Seventh St & Ann St

Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

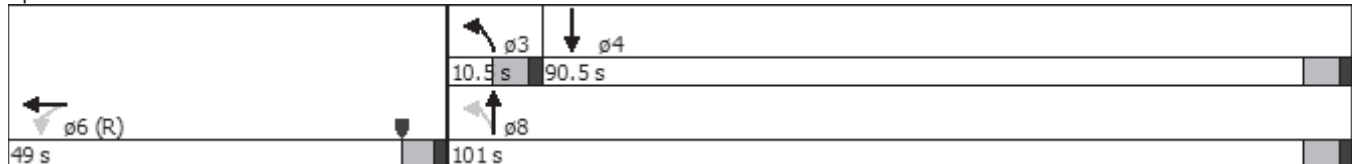
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)				0.0	0.0		0.0	0.0			0.0	
Time To Reduce (s)				0.0	0.0		0.0	0.0			0.0	
Recall Mode				C-Max	C-Max		None	None			None	
Walk Time (s)				7.0	7.0			7.0			7.0	
Flash Dont Walk (s)				11.0	11.0			8.0			8.0	
Pedestrian Calls (#/hr)				14	14			2			2	
Act Effct Green (s)					62.7			78.8			78.8	
Actuated g/C Ratio					0.42			0.53			0.53	
v/c Ratio					0.38			0.78			0.63	
Control Delay					35.6			38.9			23.1	
Queue Delay					0.0			0.0			1.6	
Total Delay					35.6			38.9			24.7	
LOS					D			D			C	
Approach Delay					35.6			38.9			24.7	
Approach LOS					D			D			C	
Queue Length 50th (ft)					193			294			291	
Queue Length 95th (ft)					294			268			325	
Internal Link Dist (ft)		193			204			433			376	
Turn Bay Length (ft)												
Base Capacity (vph)					768			600			934	
Starvation Cap Reductn					0			0			248	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.38			0.64			0.75	

Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 115 (77%), Referenced to phase 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 32.0
 Intersection Capacity Utilization 63.2%
 Analysis Period (min) 15
















Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 12: Seventh St & Ann St



HCM 2010 Signalized Intersection Summary
 12: Seventh St & Ann St

Stroudsburg Boro. P.M. Peak Hour With Peds
 Existing Year 2013

Movement												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	44	131	33	148	163	0	0	387	64
Number				1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj				1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00	0.90
Adj Sat Flow veh/h/ln				195.6	193.4	195.6	202.5	199.5	0.0	0.0	188.4	190.0
Lanes				0	1	0	0	1	0	0	1	0
Cap, veh/h				229	431	129	246	264	0	0	596	123
Arrive On Green				0.47	0.47	0.46	0.44	0.44	0.00	0.00	0.87	0.85
Sat Flow, veh/h				484	911	273	437	604	0	0	1364	282
Grp Volume(v), veh/h				293	0	0	384	0	0	0	0	513
Grp Sat Flow(s),veh/h/ln				1669	0	0	1040	0	0	0	0	1646
Q Serve(g_s), s				10.7	0.0	0.0	0.1	0.0	0.0	0.0	0.0	10.1
Cycle Q Clear(g_c), s				10.7	0.0	0.0	34.3	0.0	0.0	0.0	0.0	10.1
Prop In Lane				0.29		0.16	0.47		0.00	0.00		0.17
Lane Grp Cap(c), veh/h				790	0	0	510	0	0	0	0	719
V/C Ratio(X)				0.37	0.00	0.00	0.75	0.00	0.00	0.00	0.00	0.71
Avail Cap(c_a), veh/h				790	0	0	1270	0	0	0	0	1490
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(l)				1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.42
Uniform Delay (d), s/veh				16.0	0.0	0.0	27.5	0.0	0.0	0.0	0.0	4.1
Incr Delay (d2), s/veh				1.3	0.0	0.0	2.3	0.0	0.0	0.0	0.0	0.6
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln				4.6	0.0	0.0	8.2	0.0	0.0	0.0	0.0	1.8
Lane Grp Delay (d), s/veh				17.4	0.0	0.0	29.8	0.0	0.0	0.0	0.0	4.7
Lane Grp LOS				B			C					A
Approach Vol, veh/h					293			384			513	
Approach Delay, s/veh					17.4			29.8			4.7	
Approach LOS					B			C			A	
Timer												
Assigned Phs					6		3	8			4	
Phs Duration (G+Y+Rc), s					49.0		0.0	46.2			46.2	
Change Period (Y+Rc), s					5.0		5.5	5.5			5.5	
Max Green Setting (Gmax), s					44.0		5.0	95.5			85.0	
Max Q Clear Time (g_c+I1), s					12.7		0.0	36.3			12.1	
Green Ext Time (p_c), s					0.7		0.0	4.6			4.7	
















Intersection Summary

HCM 2010 Ctrl Delay	15.9
HCM 2010 LOS	B

Notes

Lanes, Volumes, Timings
13: 6th St & Main Street

Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	27	527	19	15	245	34	44	65	61	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	16	16	16	11	11	11	12	12	12
Grade (%)		-1%			2%			-1%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.994			0.982			0.955				
Flt Protected		0.997			0.997			0.988				
Satd. Flow (prot)	0	2945	0	0	1677	0	0	1554	0	0	0	0
Flt Permitted		0.897			0.935			0.988				
Satd. Flow (perm)	0	2650	0	0	1573	0	0	1554	0	0	0	0
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)		4			7							35
Link Speed (mph)		35			35			35				35
Link Distance (ft)		308			744			383				229
Travel Time (s)		6.0			14.5			7.5				4.5
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.61	0.90	0.68	0.63	0.83	0.71	0.79	0.68	0.80	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	2%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)		0	0	0	0	0						
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	44	586	28	24	295	48	56	96	76	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	658	0	0	367	0	0	228	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA				
Protected Phases		2			6			4				
Permitted Phases	2			6			4					
Detector Phase	2	2		6	6		4	4				
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0				
Minimum Split (s)	15.0	15.0		15.0	15.0		12.0	12.0				
Total Split (s)	78.0	78.0		78.0	78.0		53.0	53.0				
Total Split (%)	52.0%	52.0%		52.0%	52.0%		35.3%	35.3%				
Maximum Green (s)	73.0	73.0		73.0	73.0		48.0	48.0				
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5				
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5				
Lost Time Adjust (s)		-1.0			-1.0			-1.0				
Total Lost Time (s)		4.0			4.0			4.0				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0				
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0				

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	19.0
Total Split (s)	19.0
Total Split (%)	13%
Maximum Green (s)	17.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Minimum Gap (s)	3.0

Lanes, Volumes, Timings
13: 6th St & Main Street

Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

Lane Group												
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None				
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		94.4			94.4			28.6				
Actuated g/C Ratio		0.63			0.63			0.19				
v/c Ratio		0.39			0.37			0.77				
Control Delay		9.2			15.9			74.2				
Queue Delay		0.5			0.0			0.0				
Total Delay		9.6			15.9			74.2				
LOS		A			B			E				
Approach Delay		9.6			15.9			74.2				
Approach LOS		A			B			E				
Queue Length 50th (ft)		150			179			214				
Queue Length 95th (ft)		200			259			207				
Internal Link Dist (ft)		228			664			303			149	
Turn Bay Length (ft)												
Base Capacity (vph)		1669			992			507				
Starvation Cap Reductn		542			0			0				
Spillback Cap Reductn		0			0			0				
Storage Cap Reductn		0			0			0				
Reduced v/c Ratio		0.58			0.37			0.45				

Intersection Summary

Area Type: CBD
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 28 (19%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 23.2
 Intersection Capacity Utilization 47.8%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service A

Splits and Phases: 13: 6th St & Main Street

φ2 (R) 78 s		φ4 53 s	φ9 19 s
φ6 (R) 78 s			

Lane Group	ø9
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	10.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings
14: Ann St & Broad St/5th St & Main Street

Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

	→	↘	↙	↗	↘	↓	↙	ø9
Lane Group	EBT	EBR	NBL2	NBR	SBL	SBT	SBR2	
Lane Configurations	↑↑		↘	↗	↘	↑	↗	
Volume (vph)	513	58	203	459	78	447	348	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	11	10	11	10	10	11	
Grade (%)	-5%					2%		
Storage Length (ft)		0		0	0			
Storage Lanes		0		1	1			
Taper Length (ft)					25			
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor								
Frt	0.985			0.850			0.850	
Flt Protected			0.950		0.950			
Satd. Flow (prot)	*3372	0	1509	1398	*1752	*1793	1377	
Flt Permitted			0.243		0.950			
Satd. Flow (perm)	*3372	0	386	1398	*1752	*1792	1377	
Right Turn on Red				No	No		Yes	
Satd. Flow (RTOR)							382	
Link Speed (mph)	25					25		
Link Distance (ft)	744					298		
Travel Time (s)	20.3					8.2		
Confl. Peds. (#/hr)								
Confl. Bikes (#/hr)								
Peak Hour Factor	0.92	0.91	0.91	0.96	0.81	0.95	0.91	
Growth Factor	100%	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	0%	0%	1%	1%	3%	2%	1%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	
Parking (#/hr)								
Mid-Block Traffic (%)	0%					0%		
Adj. Flow (vph)	558	64	223	478	96	471	382	
Shared Lane Traffic (%)								
Lane Group Flow (vph)	622	0	223	478	96	471	382	
Turn Type	NA		custom	custom	pm+pt	NA	custom	
Protected Phases	8		1	6	5	2		9
Permitted Phases			6		2		2 8	
Detector Phase	8		1	6	5	2	2 8	
Switch Phase								
Minimum Initial (s)	7.0		5.0	10.0	5.0	10.0		1.0
Minimum Split (s)	14.0		12.5	16.5	11.5	16.5		22.0
Total Split (s)	40.0		27.5	76.5	11.5	60.5		22.0
Total Split (%)	26.7%		18.3%	51.0%	7.7%	40.3%		15%
Maximum Green (s)	33.0		21.0	70.0	5.0	54.0		20.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0		2.0
All-Red Time (s)	3.0		2.5	2.5	2.5	2.5		0.0
Lost Time Adjust (s)	-2.5		0.0	-2.5	-2.5	-2.5		
Total Lost Time (s)	4.5		6.5	4.0	4.0	4.0		
Lead/Lag			Lead	Lag	Lead	Lag		
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		3.0
Minimum Gap (s)	3.0		3.0	3.0	3.0	3.0		3.0

Lanes, Volumes, Timings
 14: Ann St & Broad St/5th St & Main Street

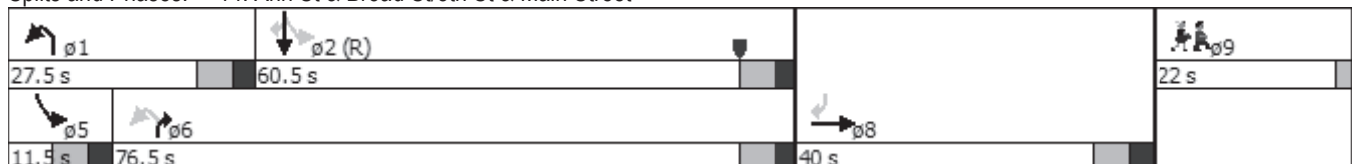
Stroudsburg Boro. P.M. Peak Hour With Peds
 Existing Year 2013

Lane Group	→	↘	↙	↗	↘	↓	↙	ø9
	EBT	EBR	NBL2	NBR	SBL	SBT	SBR2	
Time Before Reduce (s)	0.0		0.0	0.0	0.0	0.0		0.0
Time To Reduce (s)	0.0		0.0	0.0	0.0	0.0		0.0
Recall Mode	None		None	None	None	C-Max		Ped
Walk Time (s)								7.0
Flash Dont Walk (s)								13.0
Pedestrian Calls (#/hr)								15
Act Effct Green (s)	33.9		82.7	73.4	70.3	62.2	98.2	
Actuated g/C Ratio	0.23		0.55	0.49	0.47	0.41	0.65	
v/c Ratio	0.82		0.66	0.70	0.12	0.63	0.37	
Control Delay	45.2		27.9	36.8	15.0	37.1	1.8	
Queue Delay	0.0		0.0	0.0	0.0	1.1	0.0	
Total Delay	45.2		27.9	36.8	15.0	38.2	1.8	
LOS	D		C	D	B	D	A	
Approach Delay	45.2					21.2		
Approach LOS	D					C		
Queue Length 50th (ft)	235		114	361	36	354	10	
Queue Length 95th (ft)	330		169	506	m47	m450	m22	
Internal Link Dist (ft)	664					218		
Turn Bay Length (ft)			190					
Base Capacity (vph)	798		370	684	821	743	1043	
Starvation Cap Reductn	0		0	0	0	106	0	
Spillback Cap Reductn	0		0	0	0	0	0	
Storage Cap Reductn	0		0	0	0	0	0	
Reduced v/c Ratio	0.78		0.60	0.70	0.12	0.74	0.37	

Intersection Summary

Area Type: CBD
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 112 (75%), Referenced to phase 2:SBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 31.7
 Intersection Capacity Utilization 66.9%
 Analysis Period (min) 15
 * User Entered Value
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: Ann St & Broad St/5th St & Main Street



HCM 2010 methodology does not support more than 4 approaches.

Lanes, Volumes, Timings
20: McConnell St & 4th St

Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	90	19	122	1	0	0	0	0	142	765	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	14	14	14	12	12	12	14	14	14
Grade (%)		1%			-1%			0%			1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor												
Frt		0.977										
Flt Protected					0.953						0.992	
Satd. Flow (prot)	0	*862	0	*619	1730	0	0	0	0	0	*1459	0
Flt Permitted					0.481						0.992	
Satd. Flow (perm)	0	*862	0	*606	873	0	0	0	0	0	*1459	0
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)		6										
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		163			256			357			512	
Travel Time (s)		4.4			7.0			7.6			14.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.75	0.79	0.78	0.92	0.92	0.92	0.92	0.92	0.85	0.89	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	0%	0%	1%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	120	24	156	1	0	0	0	0	167	860	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	144	0	0	157	0	0	0	0	0	1027	0
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		7.0		7.0	7.0					10.0	10.0	
Minimum Split (s)		22.0		22.0	22.0					21.0	21.0	
Total Split (s)		34.0		34.0	34.0					116.0	116.0	
Total Split (%)		22.7%		22.7%	22.7%					77.3%	77.3%	
Maximum Green (s)		29.0		29.0	29.0					111.0	111.0	
Yellow Time (s)		3.5		3.5	3.5					3.5	3.5	
All-Red Time (s)		1.5		1.5	1.5					1.5	1.5	
Lost Time Adjust (s)		-1.0			0.0						-1.0	
Total Lost Time (s)		4.0			5.0						4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	
Minimum Gap (s)		3.0		3.0	3.0					3.0	3.0	

Lanes, Volumes, Timings
20: McConnell St & 4th St

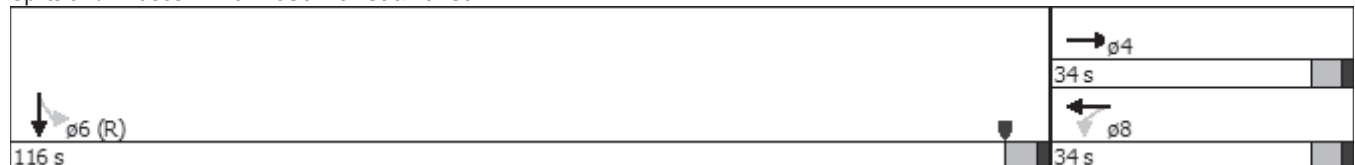
Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)		0.0		0.0	0.0					0.0	0.0	
Time To Reduce (s)		0.0		0.0	0.0					0.0	0.0	
Recall Mode		None		None	None					C-Max	C-Max	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		10.0		10.0	10.0					9.0	9.0	
Pedestrian Calls (#/hr)		3		3	3					21	21	
Act Effct Green (s)		29.1			28.1						112.9	
Actuated g/C Ratio		0.19			0.19						0.75	
v/c Ratio		0.84			0.96						0.94	
Control Delay		91.8			120.7						27.0	
Queue Delay		0.0			0.0						0.1	
Total Delay		91.8			120.7						27.1	
LOS		F			F						C	
Approach Delay		91.8			120.7						27.1	
Approach LOS		F			F						C	
Queue Length 50th (ft)		131			153						305	
Queue Length 95th (ft)		#183			#299						#634	
Internal Link Dist (ft)		83			176			277			432	
Turn Bay Length (ft)												
Base Capacity (vph)		177			168						1098	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						2	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.81			0.93						0.94	

Intersection Summary

















Area Type: CBD
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 112 (75%), Referenced to phase 6:SBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 45.2
 Intersection Capacity Utilization 49.8%
 Analysis Period (min) 15
 * User Entered Value
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 20: McConnell St & 4th St





















HCM 2010 Signalized Intersection Summary
 20: McConnell St & 4th St

Stroudsburg Boro. P.M. Peak Hour With Peds
 Existing Year 2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											 	
Volume (veh/h)	0	90	19	122	1	0	0	0	0	142	765	0
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	177.0	177.0	178.7	177.0	0.0				177.0	175.2	0.0
Lanes	0	1	0	0	1	0				0	2	0
Cap, veh/h	0	286	57	192	1	0				403	2193	0
Arrive On Green	0.00	0.20	0.19	0.20	0.19	0.00				0.75	0.75	0.00
Sat Flow, veh/h	0	1432	286	743	5	0				540	2937	0
Grp Volume(v), veh/h	0	0	144	157	0	0				534	493	0
Grp Sat Flow(s),veh/h/ln	0	0	1719	748	0	0				1725	1752	0
Q Serve(g_s), s	0.0	0.0	11.0	19.0	0.0	0.0				17.0	14.9	0.0
Cycle Q Clear(g_c), s	0.0	0.0	11.0	30.0	0.0	0.0				17.0	14.9	0.0
Prop In Lane	0.00		0.17	0.99		0.00				0.31		0.00
Lane Grp Cap(c), veh/h	0	0	344	197	0	0				1288	1308	0
V/C Ratio(X)	0.00	0.00	0.42	0.80	0.00	0.00				0.41	0.38	0.00
Avail Cap(c_a), veh/h	0	0	344	197	0	0				1288	1308	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	0.00				1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	52.5	66.3	0.0	0.0				7.0	6.7	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.8	19.8	0.0	0.0				1.0	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.0	0.0	5.0	7.2	0.0	0.0				6.9	6.2	0.0
Lane Grp Delay (d), s/veh	0.0	0.0	53.3	86.1	0.0	0.0				8.0	7.5	0.0
Lane Grp LOS			D	F						A	A	
Approach Vol, veh/h		144			157						1027	
Approach Delay, s/veh		53.3			86.1						7.8	
Approach LOS		D			F						A	
Timer												
Assigned Phs		4			8						6	
Phs Duration (G+Y+Rc), s		34.0			34.0						116.0	
Change Period (Y+Rc), s		5.0			5.0						5.0	
Max Green Setting (Gmax), s		29.0			29.0						111.0	
Max Q Clear Time (g_c+I1), s		13.0			32.0						0.0	
Green Ext Time (p_c), s		1.0			0.0						0.0	
Intersection Summary												
HCM 2010 Ctrl Delay			22.0									
HCM 2010 LOS			C									
Notes												

Lanes, Volumes, Timings
21: McConnell St & 3rd St

Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											  	
Volume (vph)	0	105	72	16	126	0	0	0	0	9	941	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	12	12	12	13	11	14
Grade (%)		1%			-2%			0%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		175
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor												
Frt		0.949										0.850
Flt Protected					0.991						0.999	
Satd. Flow (prot)	0	*1762	0	0	*1857	0	0	0	0	0	*1931	1558
Flt Permitted					0.874						0.999	
Satd. Flow (perm)	0	*1762	0	0	*1857	0	0	0	0	0	*1931	1558
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)		43										155
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		348			248			268			452	
Travel Time (s)		9.5			6.8			7.3			7.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.80	0.90	0.57	0.96	0.92	0.92	0.92	0.92	0.56	0.97	0.74
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	131	80	28	131	0	0	0	0	16	970	155
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	211	0	0	159	0	0	0	0	0	986	155
Turn Type		NA		Perm	NA					Perm	NA	Perm
Protected Phases		4			8						6	
Permitted Phases				8						6		6
Detector Phase		4		8	8					6	6	6
Switch Phase												
Minimum Initial (s)		7.0		7.0	7.0					10.0	10.0	10.0
Minimum Split (s)		28.0		28.0	28.0					21.0	21.0	21.0
Total Split (s)		28.0		28.0	28.0					47.0	47.0	47.0
Total Split (%)		37.3%		37.3%	37.3%					62.7%	62.7%	62.7%
Maximum Green (s)		23.0		23.0	23.0					42.0	42.0	42.0
Yellow Time (s)		3.0		3.0	3.0					3.5	3.5	3.5
All-Red Time (s)		2.0		2.0	2.0					1.5	1.5	1.5
Lost Time Adjust (s)		-1.0			-1.0						-1.0	-1.0
Total Lost Time (s)		4.0			4.0						4.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	3.0
Minimum Gap (s)		3.0		3.0	3.0					3.0	3.0	3.0

Lanes, Volumes, Timings
21: McConnell St & 3rd St

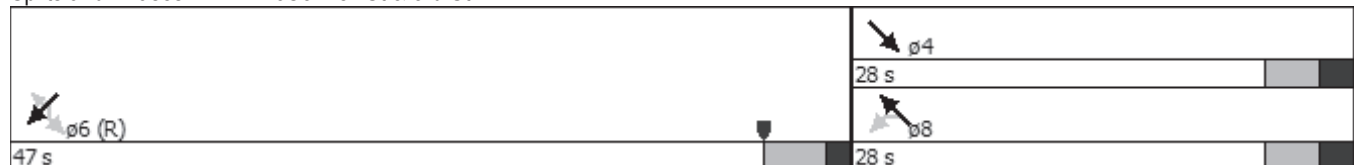
Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Time Before Reduce (s)		0.0		0.0	0.0					0.0	0.0	0.0
Time To Reduce (s)		0.0		0.0	0.0					0.0	0.0	0.0
Recall Mode		None		None	None					C-Max	C-Max	C-Max
Walk Time (s)		9.0		9.0	9.0					7.0	7.0	7.0
Flash Dont Walk (s)		14.0		14.0	14.0					9.0	9.0	9.0
Pedestrian Calls (#/hr)		6		6	6					3	3	3
Act Effct Green (s)		14.6			14.6						52.4	52.4
Actuated g/C Ratio		0.19			0.19						0.70	0.70
v/c Ratio		0.56			0.44						0.73	0.14
Control Delay		26.1			28.9						13.5	1.5
Queue Delay		0.0			0.0						0.0	0.0
Total Delay		26.1			28.9						13.5	1.5
LOS		C			C						B	A
Approach Delay		26.1			28.9						11.9	
Approach LOS		C			C						B	
Queue Length 50th (ft)		72			67						115	0
Queue Length 95th (ft)		96			100						#341	12
Internal Link Dist (ft)		268			168			188			372	
Turn Bay Length (ft)												175
Base Capacity (vph)		593			594						1348	1134
Starvation Cap Reductn		0			0						0	0
Spillback Cap Reductn		0			0						0	0
Storage Cap Reductn		0			0						0	0
Reduced v/c Ratio		0.36			0.27						0.73	0.14

Intersection Summary


















Area Type: CBD
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 19 (25%), Referenced to phase 6:SWTL, Start of Yellow
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.73
 Intersection Signal Delay: 15.6
 Intersection Capacity Utilization 58.1%
 Analysis Period (min) 15
 * User Entered Value
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 21: McConnell St & 3rd St




















HCM 2010 Signalized Intersection Summary
 21: McConnell St & 3rd St

Stroudsburg Boro. P.M. Peak Hour With Peds
 Existing Year 2013

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											 	
Volume (veh/h)	0	105	72	16	126	0	0	0	0	9	941	115
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	169.5	170.1	172.7	172.7	0.0				178.7	170.2	178.7
Lanes	0	1	0	0	1	0				0	2	1
Cap, veh/h	0	197	120	88	228	0				36	2259	1025
Arrive On Green	0.00	0.20	0.18	0.20	0.20	0.00				0.67	0.67	0.67
Sat Flow, veh/h	0	986	602	106	1140	0				53	3348	1519
Grp Volume(v), veh/h	0	0	211	159	0	0				516	470	155
Grp Sat Flow(s),veh/h/ln	0	0	1589	1246	0	0				1699	1702	1519
Q Serve(g_s), s	0.0	0.0	7.8	0.8	0.0	0.0				9.0	7.9	2.4
Cycle Q Clear(g_c), s	0.0	0.0	7.8	8.6	0.0	0.0				9.0	7.9	2.4
Prop In Lane	0.00		0.38	0.18		0.00				0.03		1.00
Lane Grp Cap(c), veh/h	0	0	318	316	0	0				1146	1148	1025
V/C Ratio(X)	0.00	0.00	0.66	0.50	0.00	0.00				0.45	0.41	0.15
Avail Cap(c_a), veh/h	0	0	598	592	0	0				1146	1148	1025
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	23.7	22.8	0.0	0.0				4.8	4.7	3.8
Incr Delay (d2), s/veh	0.0	0.0	2.4	1.2	0.0	0.0				1.3	1.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.0	0.0	3.2	2.2	0.0	0.0				3.3	2.8	0.7
Lane Grp Delay (d), s/veh	0.0	0.0	26.1	24.0	0.0	0.0				6.1	5.7	4.1
Lane Grp LOS			C	C						A	A	A
Approach Vol, veh/h		211			159						1141	
Approach Delay, s/veh		26.1			24.0						5.7	
Approach LOS		C			C						A	
Timer												
Assigned Phs		4			8						6	
Phs Duration (G+Y+Rc), s		16.7			16.7						47.0	
Change Period (Y+Rc), s		5.0			5.0						5.0	
Max Green Setting (Gmax), s		23.0			23.0						42.0	
Max Q Clear Time (g_c+I1), s		9.8			10.6						11.0	
Green Ext Time (p_c), s		1.1			1.1						3.3	
Intersection Summary												
HCM 2010 Ctrl Delay			10.5									
HCM 2010 LOS			B									
Notes												

Lanes, Volumes, Timings
24: 5th St & Sarah St

Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	135	82	118	2	245	209	26	85	2	18	292	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	12	12	12	11	11	11	16	16	16
Grade (%)		-6%			7%			14%			-10%	
Storage Length (ft)	0		0	0		150	0		0	0		0
Storage Lanes	0		0	0		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.955				0.850		0.996			0.964	
Flt Protected		0.980			0.999			0.984			0.997	
Satd. Flow (prot)	0	1681	0	0	1648	1403	0	1507	0	0	1937	0
Flt Permitted		0.748			0.995			0.733			0.976	
Satd. Flow (perm)	0	1283	0	0	1642	1403	0	1122	0	0	1897	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		60				243		2			30	
Link Speed (mph)		25			35			35			35	
Link Distance (ft)		447			479			476			360	
Travel Time (s)		12.2			9.3			9.3			7.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.84	0.85	0.92	0.50	0.84	0.86	0.54	0.85	0.50	0.75	0.94	0.82
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)	0	0	0									
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	161	96	128	4	292	243	48	100	4	24	311	124
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	385	0	0	296	243	0	152	0	0	459	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	10.5	28.5		28.5	28.5	28.5	26.0	26.0		26.0	26.0	
Total Split (s)	10.5	39.0		28.5	28.5	28.5	26.0	26.0		26.0	26.0	
Total Split (%)	16.2%	60.0%		43.8%	43.8%	43.8%	40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	5.0	33.5		23.0	23.0	23.0	19.0	19.0		19.0	19.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	5.0	5.0		5.0	5.0	
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.5			-1.5	-1.5		-1.5			-1.5	
Total Lost Time (s)		4.0			4.0	4.0		5.5			5.5	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	5.0	5.0		5.0	5.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	2.5	2.5		2.5	2.5	

Lanes, Volumes, Timings
24: 5th St & Sarah St

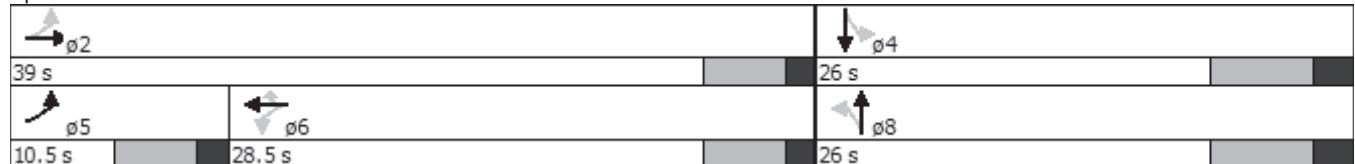
Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		3.0	3.0	3.0	26.0	26.0		26.0	26.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	10.0	10.0		10.0	10.0	
Recall Mode	None	None		None	None	None	Min	Min		Min	Min	
Walk Time (s)		11.0		11.0	11.0	11.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		12.0		12.0	12.0	12.0	12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)		1		1	1	1	1	1		1	1	
Act Effct Green (s)		22.8			22.8	22.8		15.7			15.7	
Actuated g/C Ratio		0.47			0.47	0.47		0.32			0.32	
v/c Ratio		0.61			0.39	0.31		0.42			0.73	
Control Delay		12.9			10.2	2.5		19.4			23.6	
Queue Delay		0.0			0.0	0.0		0.0			0.0	
Total Delay		12.9			10.2	2.5		19.4			23.6	
LOS		B			B	A		B			C	
Approach Delay		12.9			6.7			19.4			23.6	
Approach LOS		B			A			B			C	
Queue Length 50th (ft)		61			50	0		33			105	
Queue Length 95th (ft)		130			96	24		89			#280	
Internal Link Dist (ft)		367			399			396			280	
Turn Bay Length (ft)						150						
Base Capacity (vph)		969			980	935		512			881	
Starvation Cap Reductn		0			0	0		0			0	
Spillback Cap Reductn		0			0	0		0			0	
Storage Cap Reductn		0			0	0		0			0	
Reduced v/c Ratio		0.40			0.30	0.26		0.30			0.52	

Intersection Summary

Area Type: CBD
 Cycle Length: 65
 Actuated Cycle Length: 48.8
 Natural Cycle: 65
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.73
 Intersection Signal Delay: 14.6
 Intersection Capacity Utilization 73.0%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service D
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.























Splits and Phases: 24: 5th St & Sarah St



HCM 2010 analysis expects stop-line detection. Detectors can not be further than 20 feet from the stop bar.

Lanes, Volumes, Timings
8: Dreher Ave/School Drive & Main Street

Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	399	39	157	559	107	36	28	137	116	32	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	14	12	11	12	14	12	14	16	14	14	12
Grade (%)		-1%			0%			1%			1%	
Storage Length (ft)	145		0	125		210	85		0	105		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.988				0.850		0.872			0.902	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1337	1728	0	1525	1613	1397	1483	1522	0	1567	1488	0
Flt Permitted	0.320			0.195			0.669			0.389		
Satd. Flow (perm)	451	1728	0	313	1613	1397	1044	1522	0	642	1488	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				80		178			58	
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		538			949			624			208	
Travel Time (s)		10.5			18.5			12.2			5.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.86	0.92	0.91	0.92	0.92	0.81	0.92	0.77	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	18%	4%	14%	3%	6%	11%	9%	10%	3%	10%	10%	10%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	62	464	42	173	608	116	44	30	178	126	35	65
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	506	0	173	608	116	44	208	0	126	100	0
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	2	2		1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	17.0	17.0		12.0	17.0	17.0	13.0	13.0		13.0	13.0	
Total Split (s)	58.0	58.0		18.0	76.0	76.0	40.0	40.0		40.0	40.0	
Total Split (%)	38.7%	38.7%		12.0%	50.7%	50.7%	26.7%	26.7%		26.7%	26.7%	
Maximum Green (s)	51.0	51.0		11.0	69.0	69.0	34.0	34.0		34.0	34.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	0.0	-2.0	-2.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	7.0	4.0	4.0		6.0	6.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	34.0
Total Split (s)	34.0
Total Split (%)	23%
Maximum Green (s)	32.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Minimum Gap (s)	3.0

Lanes, Volumes, Timings
8: Dreher Ave/School Drive & Main Street

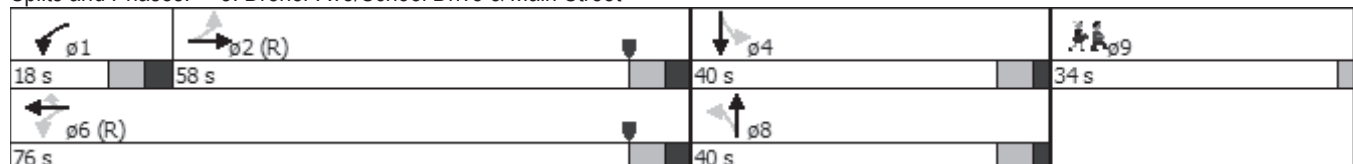
Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	C-Max	C-Max		None	C-Max	C-Max	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	56.7	56.7		75.0	75.0	73.0	32.0	32.0		30.0	30.0	
Actuated g/C Ratio	0.38	0.38		0.50	0.50	0.49	0.21	0.21		0.20	0.20	
v/c Ratio	0.36	0.77		0.66	0.75	0.16	0.20	0.45		0.98	0.29	
Control Delay	43.5	51.2		39.8	32.5	8.5	48.8	12.9		134.5	24.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	43.5	51.2		39.8	32.5	8.5	48.8	12.9		134.5	24.2	
LOS	D	D		D	C	A	D	B		F	C	
Approach Delay		50.3			30.8			19.1			85.7	
Approach LOS		D			C			B			F	
Queue Length 50th (ft)	45	449		85	340	13	34	23		120	33	
Queue Length 95th (ft)	95	565		166	438	49	64	97		#246	87	
Internal Link Dist (ft)		458			869			544			128	
Turn Bay Length (ft)	145			125		210	85			105		
Base Capacity (vph)	170	655		265	806	721	250	500		145	382	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.36	0.77		0.65	0.75	0.16	0.18	0.42		0.87	0.26	

Intersection Summary

Area Type: CBD
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 58 (39%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.98
 Intersection Signal Delay: 41.4
 Intersection Capacity Utilization 75.9%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service D
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 8: Dreher Ave/School Drive & Main Street



Lane Group	ø9
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	25.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings
9: 9th St & Main Street

Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	177	362	7	2	306	161	43	74	63	301	8	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	11	11	12	11	11	11	10	10	10
Grade (%)		4%			1%			5%			-2%	
Storage Length (ft)	0		0	0		0	0		0	135		0
Storage Lanes	0		0	0		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.996				0.850		0.954			0.867	
Flt Protected		0.980			0.999			0.989		0.950		
Satd. Flow (prot)	0	2708	0	0	1596	1252	0	1494	0	1516	1378	0
Flt Permitted		0.596			0.993			0.919		0.504		
Satd. Flow (perm)	0	1647	0	0	1586	1252	0	1388	0	804	1378	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			35	
Link Distance (ft)		352			552			437			1438	
Travel Time (s)		7.9			5.2			11.9			4.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.57	0.85	0.35	0.50	0.81	0.77	0.77	0.64	0.72	0.91	1.00	0.55
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	9%	3%	0%	0%	3%	4%	2%	3%	0%	1%	13%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)		0	0			0						
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	311	426	20	4	378	209	56	116	88	331	8	64
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	757	0	0	382	209	0	260	0	331	72	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	9.5	14.5		14.5	14.5	14.5	13.0	13.0		13.0	13.0	
Total Split (s)	9.5	68.0		58.5	58.5	58.5	58.0	58.0		58.0	58.0	
Total Split (%)	6.3%	45.3%		39.0%	39.0%	39.0%	38.7%	38.7%		38.7%	38.7%	
Maximum Green (s)	5.0	63.5		54.0	54.0	54.0	52.0	52.0		52.0	52.0	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-0.5			-0.5	-0.5		-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0			4.0	4.0		4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	16%
Maximum Green (s)	22.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Minimum Gap (s)	3.0

Lanes, Volumes, Timings
9: 9th St & Main Street

Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		64.0		64.0	64.0		54.0			54.0	54.0	
Actuated g/C Ratio		0.43		0.43	0.43		0.36			0.36	0.36	
v/c Ratio		1.45dl		0.57	0.39		0.52			1.15	0.15	
Control Delay		83.6		31.5	28.3		42.4			141.1	33.5	
Queue Delay		0.0		1.0	0.0		0.0			0.0	0.0	
Total Delay		83.6		32.4	28.3		42.4			141.1	33.5	
LOS		F		C	C		D			F	C	
Approach Delay		83.6		31.0			42.4				121.8	
Approach LOS		F		C			D				F	
Queue Length 50th (ft)		~423		238	128		200			~378	48	
Queue Length 95th (ft)		#506		277	156		191			#579	87	
Internal Link Dist (ft)		272		472			357				1358	
Turn Bay Length (ft)										135		
Base Capacity (vph)		702		676	534		499			289	496	
Starvation Cap Reductn		0		112	0		0			0	0	
Spillback Cap Reductn		0		0	0		0			0	0	
Storage Cap Reductn		0		0	0		0			0	0	
Reduced v/c Ratio		1.08		0.68	0.39		0.52			1.15	0.15	

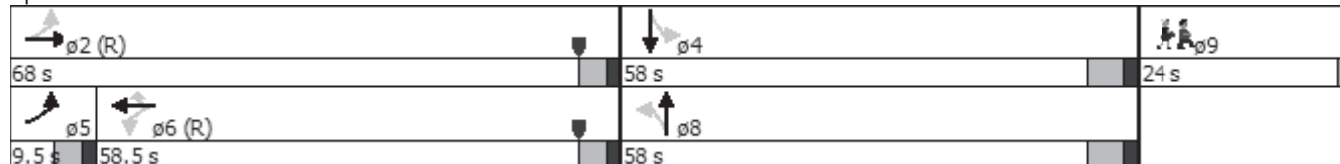
Intersection Summary

Area Type: CBD
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 62 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.15
 Intersection Signal Delay: 70.5
 Intersection Capacity Utilization 78.2%
 Analysis Period (min) 15

Intersection LOS: E
 ICU Level of Service D

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 9: 9th St & Main Street



















Lane Group	ø9
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	Ped
Walk Time (s)	8.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings
10: 8th St & Main Street/Main Street

Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	518	22	6	252	8	65	76	35	43	19	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	13	13	13	10	10	10	10	10	10
Grade (%)		0%			0%			1%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.993			0.995			0.968			0.931	
Flt Protected		0.995			0.998			0.984			0.984	
Satd. Flow (prot)	0	*3502	0	0	*1772	0	0	*1760	0	0	*1624	0
Flt Permitted		0.899			0.973			0.835			0.818	
Satd. Flow (perm)	0	*3021	0	0	*1733	0	0	*1405	0	0	*1397	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		552			555			340			310	
Travel Time (s)		8.5			8.2			9.3			8.5	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.73	0.93	0.69	0.50	0.86	0.67	0.90	0.79	0.67	0.77	0.68	0.77
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	2%	5%	0%	1%	0%	3%	0%	3%	2%	0%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)		0	0	0	0	0	0	0	0			
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	60	557	32	12	293	12	72	96	52	56	28	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	649	0	0	317	0	0	220	0	0	172	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.5	14.5		14.5	14.5		12.5	12.5		12.5	12.5	
Total Split (s)	27.5	27.5		27.5	27.5		25.5	25.5		25.5	25.5	
Total Split (%)	36.7%	36.7%		36.7%	36.7%		34.0%	34.0%		34.0%	34.0%	
Maximum Green (s)	23.0	23.0		23.0	23.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)		-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)		2.5			2.5			3.5			3.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	29%
Maximum Green (s)	20.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Minimum Gap (s)	3.0

Lanes, Volumes, Timings
10: 8th St & Main Street/Main Street






Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		30.9			30.9			18.1			18.1	
Actuated g/C Ratio		0.41			0.41			0.24			0.24	
v/c Ratio		0.52			0.44			0.65			0.51	
Control Delay		14.2			13.2			34.4			29.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		14.2			13.2			34.4			29.4	
LOS		B			B			C			C	
Approach Delay		14.2			13.2			34.4			29.4	
Approach LOS		B			B			C			C	
Queue Length 50th (ft)		164			79			91			68	
Queue Length 95th (ft)		m155			167			128			84	
Internal Link Dist (ft)		472			475			260			230	
Turn Bay Length (ft)												
Base Capacity (vph)		1245			714			412			409	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.52			0.44			0.53			0.42	

Intersection Summary

Area Type: CBD
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 44 (59%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.65
 Intersection Signal Delay: 19.2
 Intersection Capacity Utilization 58.6%
 Analysis Period (min) 15
 * User Entered Value
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: 8th St & Main Street/Main Street

 p2 (R)		 p4		 p9
27.5 s		25.5 s		22 s
 p6 (R)		 p8		
27.5 s		25.5 s		

Lane Group	ø9
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings

Stroudsburg Boro. P.M. Peak Hour With Peds

11: Seventh St/7th St & Main Street /Main Street

Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	390	139	18	250	22	54	69	57	31	124	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	13	13	13	14	14	14	11	11	11
Grade (%)		-1%			2%			4%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.963			0.984			0.963			0.975	
Flt Protected		0.998			0.997			0.983			0.988	
Satd. Flow (prot)	0	2815	0	0	1532	0	0	1633	0	0	1432	0
Flt Permitted		0.922			0.938			0.680			0.801	
Satd. Flow (perm)	0	2600	0	0	1441	0	0	1130	0	0	1161	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		555			308			456			331	
Travel Time (s)		15.1			8.4			12.4			9.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.82	0.79	0.81	0.75	0.74	0.46	0.59	0.72	0.79	0.48	0.86	0.58
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	3%	1%	0%	1%	0%	4%	3%	4%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)		0	0	0	0	0				0	0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	28	494	172	24	338	48	92	96	72	65	144	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	694	0	0	410	0	0	260	0	0	257	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	15.0		15.0	15.0		12.0	12.0		12.0	12.0	
Total Split (s)	72.0	72.0		72.0	72.0		56.0	56.0		56.0	56.0	
Total Split (%)	48.0%	48.0%		48.0%	48.0%		37.3%	37.3%		37.3%	37.3%	
Maximum Green (s)	67.0	67.0		67.0	67.0		51.0	51.0		51.0	51.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)		3.0			3.0			3.0			3.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	15%
Maximum Green (s)	20.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Minimum Gap (s)	3.0

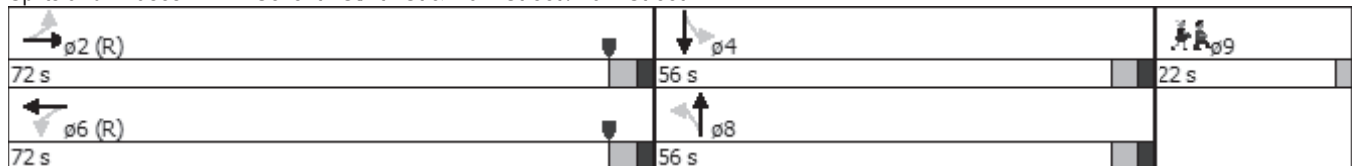
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		82.7			82.7			39.3			39.3	
Actuated g/C Ratio		0.55			0.55			0.26			0.26	
v/c Ratio		0.48			0.52			0.88			0.85	
Control Delay		14.4			17.2			62.2			75.4	
Queue Delay		0.0			0.8			0.1			0.0	
Total Delay		14.4			18.1			62.3			75.4	
LOS		B			B			E			E	
Approach Delay		14.4			18.1			62.3			75.4	
Approach LOS		B			B			E			E	
Queue Length 50th (ft)		152			151			248			239	
Queue Length 95th (ft)		166			160			224			300	
Internal Link Dist (ft)		475			228			376			251	
Turn Bay Length (ft)												
Base Capacity (vph)		1432			794			399			410	
Starvation Cap Reductn		0			159			4			0	
Spillback Cap Reductn		7			8			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.49			0.65			0.66			0.63	

Intersection Summary

Area Type: CBD
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 32.7
 Intersection Capacity Utilization 58.5%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 11: Seventh St/7th St & Main Street /Main Street


















Lane Group	ø9
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	Ped
Walk Time (s)	9.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings
12: Seventh St & Ann St

Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	44	131	33	148	163	0	0	387	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	16	16	16	16	16	16	10	10	10
Grade (%)		0%			2%			-5%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.978						0.977	
Flt Protected					0.986			0.977				
Satd. Flow (prot)	0	0	0	0	1830	0	0	2124	0	0	1546	0
Flt Permitted					0.986			0.429				
Satd. Flow (perm)	0	0	0	0	1830	0	0	933	0	0	1546	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)					7						12	
Link Speed (mph)		25			25			35			25	
Link Distance (ft)		273			284			513			456	
Travel Time (s)		7.4			7.7			10.0			12.4	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.52	0.82	0.69	0.82	0.80	0.92	0.92	0.91	0.73
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	2%	1%	0%	1%	2%	0%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)				0	0	0					0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	0	0	85	160	48	180	204	0	0	425	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	293	0	0	384	0	0	513	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					6		3	8			4	
Permitted Phases				6			8					
Detector Phase				6	6		3	8			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	7.0			7.0	
Minimum Split (s)				23.0	23.0		10.5	20.5			20.5	
Total Split (s)				49.0	49.0		10.5	101.0			90.5	
Total Split (%)				32.7%	32.7%		7.0%	67.3%			60.3%	
Maximum Green (s)				44.0	44.0		5.0	95.5			85.0	
Yellow Time (s)				3.5	3.5		4.0	4.0			4.0	
All-Red Time (s)				1.5	1.5		1.5	1.5			1.5	
Lost Time Adjust (s)					-1.0			-1.0			-1.0	
Total Lost Time (s)					4.0			4.5			4.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Minimum Gap (s)				3.0	3.0		3.0	3.0			3.0	

Lanes, Volumes, Timings
12: Seventh St & Ann St

Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

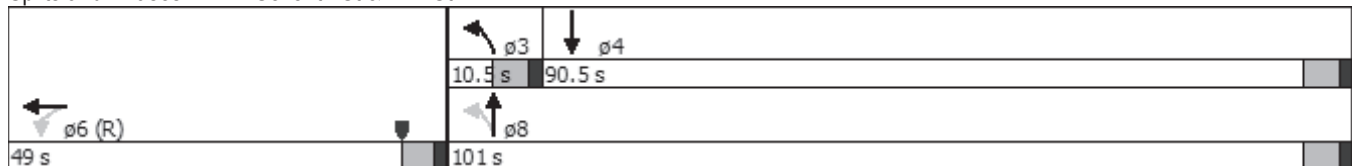
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)				0.0	0.0		0.0	0.0			0.0	
Time To Reduce (s)				0.0	0.0		0.0	0.0			0.0	
Recall Mode				C-Max	C-Max		None	None			None	
Walk Time (s)				7.0	7.0			7.0			7.0	
Flash Dont Walk (s)				11.0	11.0			8.0			8.0	
Pedestrian Calls (#/hr)				14	14			2			2	
Act Effct Green (s)					62.7			78.8			78.8	
Actuated g/C Ratio					0.42			0.53			0.53	
v/c Ratio					0.38			0.78			0.63	
Control Delay					35.6			38.9			23.1	
Queue Delay					0.0			0.0			1.6	
Total Delay					35.6			38.9			24.7	
LOS					D			D			C	
Approach Delay					35.6			38.9			24.7	
Approach LOS					D			D			C	
Queue Length 50th (ft)					193			294			291	
Queue Length 95th (ft)					294			268			325	
Internal Link Dist (ft)		193			204			433			376	
Turn Bay Length (ft)												
Base Capacity (vph)					768			600			934	
Starvation Cap Reductn					0			0			248	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.38			0.64			0.75	

Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 115 (77%), Referenced to phase 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 32.0
 Intersection Capacity Utilization 63.2%
 Analysis Period (min) 15
















Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 12: Seventh St & Ann St



HCM 2010 Signalized Intersection Summary
 12: Seventh St & Ann St

Stroudsburg Boro. P.M. Peak Hour With Peds
 Existing Year 2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	44	131	33	148	163	0	0	387	64
Number				1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj				1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00	0.90
Adj Sat Flow veh/h/ln				195.6	193.4	195.6	202.5	199.5	0.0	0.0	188.4	190.0
Lanes				0	1	0	0	1	0	0	1	0
Cap, veh/h				229	431	129	246	264	0	0	596	123
Arrive On Green				0.47	0.47	0.46	0.44	0.44	0.00	0.00	0.87	0.85
Sat Flow, veh/h				484	911	273	437	604	0	0	1364	282
Grp Volume(v), veh/h				293	0	0	384	0	0	0	0	513
Grp Sat Flow(s),veh/h/ln				1669	0	0	1040	0	0	0	0	1646
Q Serve(g_s), s				10.7	0.0	0.0	0.1	0.0	0.0	0.0	0.0	10.1
Cycle Q Clear(g_c), s				10.7	0.0	0.0	34.3	0.0	0.0	0.0	0.0	10.1
Prop In Lane				0.29		0.16	0.47		0.00	0.00		0.17
Lane Grp Cap(c), veh/h				790	0	0	510	0	0	0	0	719
V/C Ratio(X)				0.37	0.00	0.00	0.75	0.00	0.00	0.00	0.00	0.71
Avail Cap(c_a), veh/h				790	0	0	1270	0	0	0	0	1490
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(l)				1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.42
Uniform Delay (d), s/veh				16.0	0.0	0.0	27.5	0.0	0.0	0.0	0.0	4.1
Incr Delay (d2), s/veh				1.3	0.0	0.0	2.3	0.0	0.0	0.0	0.0	0.6
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln				4.6	0.0	0.0	8.2	0.0	0.0	0.0	0.0	1.8
Lane Grp Delay (d), s/veh				17.4	0.0	0.0	29.8	0.0	0.0	0.0	0.0	4.7
Lane Grp LOS				B			C					A
Approach Vol, veh/h					293			384			513	
Approach Delay, s/veh					17.4			29.8			4.7	
Approach LOS					B			C			A	
Timer												
Assigned Phs					6		3	8			4	
Phs Duration (G+Y+Rc), s					49.0		0.0	46.2			46.2	
Change Period (Y+Rc), s					5.0		5.5	5.5			5.5	
Max Green Setting (Gmax), s					44.0		5.0	95.5			85.0	
Max Q Clear Time (g_c+l1), s					12.7		0.0	36.3			12.1	
Green Ext Time (p_c), s					0.7		0.0	4.6			4.7	

Intersection Summary

HCM 2010 Ctrl Delay	15.9
HCM 2010 LOS	B

Notes

Lanes, Volumes, Timings
13: 6th St & Main Street

Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	27	527	19	15	245	34	44	65	61	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	16	16	16	11	11	11	12	12	12
Grade (%)		-1%			2%			-1%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.994			0.982			0.955				
Flt Protected		0.997			0.997			0.988				
Satd. Flow (prot)	0	2945	0	0	1677	0	0	1554	0	0	0	0
Flt Permitted		0.897			0.935			0.988				
Satd. Flow (perm)	0	2650	0	0	1573	0	0	1554	0	0	0	0
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)		4			7							35
Link Speed (mph)		35			35			35				35
Link Distance (ft)		308			744			383				229
Travel Time (s)		6.0			14.5			7.5				4.5
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.61	0.90	0.68	0.63	0.83	0.71	0.79	0.68	0.80	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	2%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)		0	0	0	0	0						
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	44	586	28	24	295	48	56	96	76	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	658	0	0	367	0	0	228	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA				
Protected Phases		2			6			4				
Permitted Phases	2			6			4					
Detector Phase	2	2		6	6		4	4				
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0				
Minimum Split (s)	15.0	15.0		15.0	15.0		12.0	12.0				
Total Split (s)	78.0	78.0		78.0	78.0		53.0	53.0				
Total Split (%)	52.0%	52.0%		52.0%	52.0%		35.3%	35.3%				
Maximum Green (s)	73.0	73.0		73.0	73.0		48.0	48.0				
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5				
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5				
Lost Time Adjust (s)		-1.0			-1.0			-1.0				
Total Lost Time (s)		4.0			4.0			4.0				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0				
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0				

Lane Group ø9

Lane Configurations

Volume (vph)

Ideal Flow (vphpl)

Lane Width (ft)

Grade (%)

Storage Length (ft)

Storage Lanes

Taper Length (ft)

Lane Util. Factor

Ped Bike Factor

Frt

Flt Protected

Satd. Flow (prot)

Flt Permitted

Satd. Flow (perm)

Right Turn on Red

Satd. Flow (RTOR)

Link Speed (mph)

Link Distance (ft)

Travel Time (s)

Confl. Peds. (#/hr)

Confl. Bikes (#/hr)

Peak Hour Factor

Growth Factor

Heavy Vehicles (%)

Bus Blockages (#/hr)

Parking (#/hr)

Mid-Block Traffic (%)

Adj. Flow (vph)

Shared Lane Traffic (%)

Lane Group Flow (vph)

Turn Type

Protected Phases 9

Permitted Phases

Detector Phase

Switch Phase

Minimum Initial (s) 1.0

Minimum Split (s) 19.0

Total Split (s) 19.0

Total Split (%) 13%

Maximum Green (s) 17.0

Yellow Time (s) 2.0

All-Red Time (s) 0.0

Lost Time Adjust (s)

Total Lost Time (s)

Lead/Lag

Lead-Lag Optimize?

Vehicle Extension (s) 3.0

Minimum Gap (s) 3.0

Lanes, Volumes, Timings
13: 6th St & Main Street

Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None				
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		94.4			94.4			28.6				
Actuated g/C Ratio		0.63			0.63			0.19				
v/c Ratio		0.39			0.37			0.77				
Control Delay		9.2			15.9			74.2				
Queue Delay		0.5			0.0			0.0				
Total Delay		9.6			15.9			74.2				
LOS		A			B			E				
Approach Delay		9.6			15.9			74.2				
Approach LOS		A			B			E				
Queue Length 50th (ft)		150			179			214				
Queue Length 95th (ft)		200			259			207				
Internal Link Dist (ft)		228			664			303			149	
Turn Bay Length (ft)												
Base Capacity (vph)		1669			992			507				
Starvation Cap Reductn		542			0			0				
Spillback Cap Reductn		0			0			0				
Storage Cap Reductn		0			0			0				
Reduced v/c Ratio		0.58			0.37			0.45				

Intersection Summary

Area Type: CBD
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 28 (19%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 23.2
 Intersection Capacity Utilization 47.8%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service A

Splits and Phases: 13: 6th St & Main Street

 φ2 (R) 78 s	 φ4 53 s	 φ9 19 s
 φ6 (R) 78 s		

Lane Group	ø9
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	10.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings
14: Ann St & Broad St/5th St & Main Street

Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

	→	↘	↙	↗	↘	↓	↗	ø9
Lane Group	EBT	EBR	NBL2	NBR	SBL	SBT	SBR2	
Lane Configurations	↑↑		↘	↗	↘	↑	↗	
Volume (vph)	513	58	203	459	78	447	348	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	11	10	11	10	10	11	
Grade (%)	-5%					2%		
Storage Length (ft)		0		0	0			
Storage Lanes		0		1	1			
Taper Length (ft)					25			
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor								
Frt	0.985			0.850			0.850	
Flt Protected			0.950		0.950			
Satd. Flow (prot)	*3372	0	1509	1398	*1752	*1793	1377	
Flt Permitted			0.243		0.950			
Satd. Flow (perm)	*3372	0	386	1398	*1752	*1792	1377	
Right Turn on Red				No	No		Yes	
Satd. Flow (RTOR)							382	
Link Speed (mph)	25					25		
Link Distance (ft)	744					298		
Travel Time (s)	20.3					8.2		
Confl. Peds. (#/hr)								
Confl. Bikes (#/hr)								
Peak Hour Factor	0.92	0.91	0.91	0.96	0.81	0.95	0.91	
Growth Factor	100%	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	0%	0%	1%	1%	3%	2%	1%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	
Parking (#/hr)								
Mid-Block Traffic (%)	0%					0%		
Adj. Flow (vph)	558	64	223	478	96	471	382	
Shared Lane Traffic (%)								
Lane Group Flow (vph)	622	0	223	478	96	471	382	
Turn Type	NA		custom	custom	pm+pt	NA	custom	
Protected Phases	8		1	6	5	2		9
Permitted Phases			6		2		2 8	
Detector Phase	8		1	6	5	2	2 8	
Switch Phase								
Minimum Initial (s)	7.0		5.0	10.0	5.0	10.0		1.0
Minimum Split (s)	14.0		12.5	16.5	11.5	16.5		22.0
Total Split (s)	40.0		27.5	76.5	11.5	60.5		22.0
Total Split (%)	26.7%		18.3%	51.0%	7.7%	40.3%		15%
Maximum Green (s)	33.0		21.0	70.0	5.0	54.0		20.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0		2.0
All-Red Time (s)	3.0		2.5	2.5	2.5	2.5		0.0
Lost Time Adjust (s)	-2.5		0.0	-2.5	-2.5	-2.5		
Total Lost Time (s)	4.5		6.5	4.0	4.0	4.0		
Lead/Lag			Lead	Lag	Lead	Lag		
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		3.0
Minimum Gap (s)	3.0		3.0	3.0	3.0	3.0		3.0

Lanes, Volumes, Timings
 14: Ann St & Broad St/5th St & Main Street

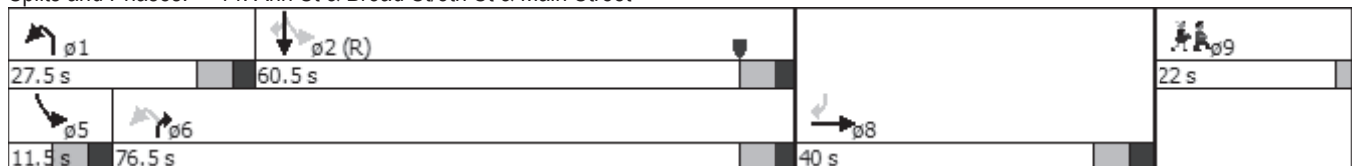
Stroudsburg Boro. P.M. Peak Hour With Peds
 Existing Year 2013

Lane Group	→	↘	↙	↗	↘	↓	↙	ø9
	EBT	EBR	NBL2	NBR	SBL	SBT	SBR2	
Time Before Reduce (s)	0.0		0.0	0.0	0.0	0.0		0.0
Time To Reduce (s)	0.0		0.0	0.0	0.0	0.0		0.0
Recall Mode	None		None	None	None	C-Max		Ped
Walk Time (s)								7.0
Flash Dont Walk (s)								13.0
Pedestrian Calls (#/hr)								15
Act Effct Green (s)	33.9		82.7	73.4	70.3	62.2	98.2	
Actuated g/C Ratio	0.23		0.55	0.49	0.47	0.41	0.65	
v/c Ratio	0.82		0.66	0.70	0.12	0.63	0.37	
Control Delay	45.2		27.9	36.8	15.0	37.1	1.8	
Queue Delay	0.0		0.0	0.0	0.0	1.1	0.0	
Total Delay	45.2		27.9	36.8	15.0	38.2	1.8	
LOS	D		C	D	B	D	A	
Approach Delay	45.2					21.2		
Approach LOS	D					C		
Queue Length 50th (ft)	235		114	361	36	354	10	
Queue Length 95th (ft)	330		169	506	m47	m450	m22	
Internal Link Dist (ft)	664					218		
Turn Bay Length (ft)			190					
Base Capacity (vph)	798		370	684	821	743	1043	
Starvation Cap Reductn	0		0	0	0	106	0	
Spillback Cap Reductn	0		0	0	0	0	0	
Storage Cap Reductn	0		0	0	0	0	0	
Reduced v/c Ratio	0.78		0.60	0.70	0.12	0.74	0.37	

Intersection Summary

Area Type: CBD
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 112 (75%), Referenced to phase 2:SBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 31.7
 Intersection Capacity Utilization 66.9%
 Analysis Period (min) 15
 * User Entered Value
 m Volume for 95th percentile queue is metered by upstream signal.


















Splits and Phases: 14: Ann St & Broad St/5th St & Main Street



HCM 2010 methodology does not support more than 4 approaches.

Lanes, Volumes, Timings
20: McConnell St & 4th St

Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											  	
Volume (vph)	0	90	19	122	1	0	0	0	0	142	765	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	14	14	14	12	12	12	14	14	14
Grade (%)		1%			-1%			0%			1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor												
Frt		0.977										
Flt Protected					0.953						0.992	
Satd. Flow (prot)	0	*862	0	*619	1730	0	0	0	0	0	*1459	0
Flt Permitted					0.481						0.992	
Satd. Flow (perm)	0	*862	0	*606	873	0	0	0	0	0	*1459	0
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)		6										
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		163			256			357			512	
Travel Time (s)		4.4			7.0			7.6			14.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.75	0.79	0.78	0.92	0.92	0.92	0.92	0.92	0.85	0.89	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	0%	0%	1%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	120	24	156	1	0	0	0	0	167	860	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	144	0	0	157	0	0	0	0	0	1027	0
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		7.0		7.0	7.0					10.0	10.0	
Minimum Split (s)		22.0		22.0	22.0					21.0	21.0	
Total Split (s)		34.0		34.0	34.0					116.0	116.0	
Total Split (%)		22.7%		22.7%	22.7%					77.3%	77.3%	
Maximum Green (s)		29.0		29.0	29.0					111.0	111.0	
Yellow Time (s)		3.5		3.5	3.5					3.5	3.5	
All-Red Time (s)		1.5		1.5	1.5					1.5	1.5	
Lost Time Adjust (s)		-1.0			0.0						-1.0	
Total Lost Time (s)		4.0			5.0						4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	
Minimum Gap (s)		3.0		3.0	3.0					3.0	3.0	

Lanes, Volumes, Timings
20: McConnell St & 4th St

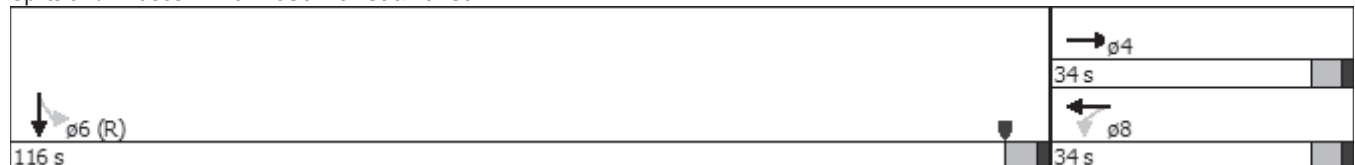
Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)		0.0		0.0	0.0					0.0	0.0	
Time To Reduce (s)		0.0		0.0	0.0					0.0	0.0	
Recall Mode		None		None	None					C-Max	C-Max	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		10.0		10.0	10.0					9.0	9.0	
Pedestrian Calls (#/hr)		3		3	3					21	21	
Act Effct Green (s)		29.1			28.1						112.9	
Actuated g/C Ratio		0.19			0.19						0.75	
v/c Ratio		0.84			0.96						0.94	
Control Delay		91.8			120.7						27.0	
Queue Delay		0.0			0.0						0.1	
Total Delay		91.8			120.7						27.1	
LOS		F			F						C	
Approach Delay		91.8			120.7						27.1	
Approach LOS		F			F						C	
Queue Length 50th (ft)		131			153						305	
Queue Length 95th (ft)		#183			#299						#634	
Internal Link Dist (ft)		83			176			277			432	
Turn Bay Length (ft)												
Base Capacity (vph)		177			168						1098	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						2	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.81			0.93						0.94	

Intersection Summary

















Area Type: CBD
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 112 (75%), Referenced to phase 6:SBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 45.2
 Intersection Capacity Utilization 49.8%
 Analysis Period (min) 15
 * User Entered Value
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 20: McConnell St & 4th St



HCM 2010 Signalized Intersection Summary
 20: McConnell St & 4th St

Stroudsburg Boro. P.M. Peak Hour With Peds
 Existing Year 2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											 	
Volume (veh/h)	0	90	19	122	1	0	0	0	0	142	765	0
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	177.0	177.0	178.7	177.0	0.0				177.0	175.2	0.0
Lanes	0	1	0	0	1	0				0	2	0
Cap, veh/h	0	286	57	192	1	0				403	2193	0
Arrive On Green	0.00	0.20	0.19	0.20	0.19	0.00				0.75	0.75	0.00
Sat Flow, veh/h	0	1432	286	743	5	0				540	2937	0
Grp Volume(v), veh/h	0	0	144	157	0	0				534	493	0
Grp Sat Flow(s),veh/h/ln	0	0	1719	748	0	0				1725	1752	0
Q Serve(g_s), s	0.0	0.0	11.0	19.0	0.0	0.0				17.0	14.9	0.0
Cycle Q Clear(g_c), s	0.0	0.0	11.0	30.0	0.0	0.0				17.0	14.9	0.0
Prop In Lane	0.00		0.17	0.99		0.00				0.31		0.00
Lane Grp Cap(c), veh/h	0	0	344	197	0	0				1288	1308	0
V/C Ratio(X)	0.00	0.00	0.42	0.80	0.00	0.00				0.41	0.38	0.00
Avail Cap(c_a), veh/h	0	0	344	197	0	0				1288	1308	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	0.00				1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	52.5	66.3	0.0	0.0				7.0	6.7	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.8	19.8	0.0	0.0				1.0	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.0	0.0	5.0	7.2	0.0	0.0				6.9	6.2	0.0
Lane Grp Delay (d), s/veh	0.0	0.0	53.3	86.1	0.0	0.0				8.0	7.5	0.0
Lane Grp LOS			D	F						A	A	
Approach Vol, veh/h		144			157						1027	
Approach Delay, s/veh		53.3			86.1						7.8	
Approach LOS		D			F						A	
Timer												
Assigned Phs		4			8						6	
Phs Duration (G+Y+Rc), s		34.0			34.0						116.0	
Change Period (Y+Rc), s		5.0			5.0						5.0	
Max Green Setting (Gmax), s		29.0			29.0						111.0	
Max Q Clear Time (g_c+I1), s		13.0			32.0						0.0	
Green Ext Time (p_c), s		1.0			0.0						0.0	
Intersection Summary												
HCM 2010 Ctrl Delay			22.0									
HCM 2010 LOS			C									
Notes												

Lanes, Volumes, Timings
21: McConnell St & 3rd St

Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↗		↖	↘		↙		↗	↖	↘	↙
Volume (vph)	0	105	72	16	126	0	0	0	0	9	941	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	12	12	12	13	11	14
Grade (%)		1%			-2%			0%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		175
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor												
Frt		0.949										0.850
Flt Protected					0.991						0.999	
Satd. Flow (prot)	0	*1762	0	0	*1857	0	0	0	0	0	*1931	1558
Flt Permitted					0.874						0.999	
Satd. Flow (perm)	0	*1762	0	0	*1857	0	0	0	0	0	*1931	1558
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)		43										155
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		348			248			268			452	
Travel Time (s)		9.5			6.8			7.3			7.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.80	0.90	0.57	0.96	0.92	0.92	0.92	0.92	0.56	0.97	0.74
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	131	80	28	131	0	0	0	0	16	970	155
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	211	0	0	159	0	0	0	0	0	986	155
Turn Type		NA		Perm	NA					Perm	NA	Perm
Protected Phases		4			8						6	
Permitted Phases				8						6		6
Detector Phase		4		8	8					6	6	6
Switch Phase												
Minimum Initial (s)		7.0		7.0	7.0					10.0	10.0	10.0
Minimum Split (s)		28.0		28.0	28.0					21.0	21.0	21.0
Total Split (s)		28.0		28.0	28.0					47.0	47.0	47.0
Total Split (%)		37.3%		37.3%	37.3%					62.7%	62.7%	62.7%
Maximum Green (s)		23.0		23.0	23.0					42.0	42.0	42.0
Yellow Time (s)		3.0		3.0	3.0					3.5	3.5	3.5
All-Red Time (s)		2.0		2.0	2.0					1.5	1.5	1.5
Lost Time Adjust (s)		-1.0			-1.0						-1.0	-1.0
Total Lost Time (s)		4.0			4.0						4.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	3.0
Minimum Gap (s)		3.0		3.0	3.0					3.0	3.0	3.0

Lanes, Volumes, Timings
21: McConnell St & 3rd St

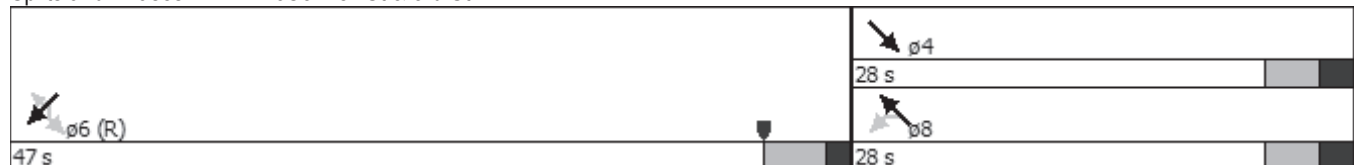
Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Time Before Reduce (s)		0.0		0.0	0.0					0.0	0.0	0.0
Time To Reduce (s)		0.0		0.0	0.0					0.0	0.0	0.0
Recall Mode		None		None	None					C-Max	C-Max	C-Max
Walk Time (s)		9.0		9.0	9.0					7.0	7.0	7.0
Flash Dont Walk (s)		14.0		14.0	14.0					9.0	9.0	9.0
Pedestrian Calls (#/hr)		6		6	6					3	3	3
Act Effct Green (s)		14.6			14.6						52.4	52.4
Actuated g/C Ratio		0.19			0.19						0.70	0.70
v/c Ratio		0.56			0.44						0.73	0.14
Control Delay		26.1			28.9						13.5	1.5
Queue Delay		0.0			0.0						0.0	0.0
Total Delay		26.1			28.9						13.5	1.5
LOS		C			C						B	A
Approach Delay		26.1			28.9						11.9	
Approach LOS		C			C						B	
Queue Length 50th (ft)		72			67						115	0
Queue Length 95th (ft)		96			100						#341	12
Internal Link Dist (ft)		268			168			188			372	
Turn Bay Length (ft)												175
Base Capacity (vph)		593			594						1348	1134
Starvation Cap Reductn		0			0						0	0
Spillback Cap Reductn		0			0						0	0
Storage Cap Reductn		0			0						0	0
Reduced v/c Ratio		0.36			0.27						0.73	0.14

Intersection Summary


















Area Type: CBD
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 19 (25%), Referenced to phase 6:SWTL, Start of Yellow
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.73
 Intersection Signal Delay: 15.6
 Intersection Capacity Utilization 58.1%
 Analysis Period (min) 15
 * User Entered Value
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 21: McConnell St & 3rd St



HCM 2010 Signalized Intersection Summary
 21: McConnell St & 3rd St

Stroudsburg Boro. P.M. Peak Hour With Peds
 Existing Year 2013

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											 	
Volume (veh/h)	0	105	72	16	126	0	0	0	0	9	941	115
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	169.5	170.1	172.7	172.7	0.0				178.7	170.2	178.7
Lanes	0	1	0	0	1	0				0	2	1
Cap, veh/h	0	197	120	88	228	0				36	2259	1025
Arrive On Green	0.00	0.20	0.18	0.20	0.20	0.00				0.67	0.67	0.67
Sat Flow, veh/h	0	986	602	106	1140	0				53	3348	1519
Grp Volume(v), veh/h	0	0	211	159	0	0				516	470	155
Grp Sat Flow(s),veh/h/ln	0	0	1589	1246	0	0				1699	1702	1519
Q Serve(g_s), s	0.0	0.0	7.8	0.8	0.0	0.0				9.0	7.9	2.4
Cycle Q Clear(g_c), s	0.0	0.0	7.8	8.6	0.0	0.0				9.0	7.9	2.4
Prop In Lane	0.00		0.38	0.18		0.00				0.03		1.00
Lane Grp Cap(c), veh/h	0	0	318	316	0	0				1146	1148	1025
V/C Ratio(X)	0.00	0.00	0.66	0.50	0.00	0.00				0.45	0.41	0.15
Avail Cap(c_a), veh/h	0	0	598	592	0	0				1146	1148	1025
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	23.7	22.8	0.0	0.0				4.8	4.7	3.8
Incr Delay (d2), s/veh	0.0	0.0	2.4	1.2	0.0	0.0				1.3	1.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.0	0.0	3.2	2.2	0.0	0.0				3.3	2.8	0.7
Lane Grp Delay (d), s/veh	0.0	0.0	26.1	24.0	0.0	0.0				6.1	5.7	4.1
Lane Grp LOS			C	C						A	A	A
Approach Vol, veh/h		211			159						1141	
Approach Delay, s/veh		26.1			24.0						5.7	
Approach LOS		C			C						A	
Timer												
Assigned Phs		4			8						6	
Phs Duration (G+Y+Rc), s		16.7			16.7						47.0	
Change Period (Y+Rc), s		5.0			5.0						5.0	
Max Green Setting (Gmax), s		23.0			23.0						42.0	
Max Q Clear Time (g_c+I1), s		9.8			10.6						11.0	
Green Ext Time (p_c), s		1.1			1.1						3.3	
Intersection Summary												
HCM 2010 Ctrl Delay			10.5									
HCM 2010 LOS			B									
Notes												

Lanes, Volumes, Timings
24: 5th St & Sarah St

Stroudsburg Boro. P.M. Peak Hour With Peds

Existing Year 2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	135	82	118	2	245	209	26	85	2	18	292	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	12	12	12	11	11	11	16	16	16
Grade (%)		-6%			7%			14%			-10%	
Storage Length (ft)	0		0	0		150	0		0	0		0
Storage Lanes	0		0	0		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.955				0.850		0.996			0.964	
Flt Protected		0.980			0.999			0.984			0.997	
Satd. Flow (prot)	0	1681	0	0	1648	1403	0	1507	0	0	1937	0
Flt Permitted		0.748			0.995			0.733			0.976	
Satd. Flow (perm)	0	1283	0	0	1642	1403	0	1122	0	0	1897	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		60				243		2			30	
Link Speed (mph)		25			35			35			35	
Link Distance (ft)		447			479			476			360	
Travel Time (s)		12.2			9.3			9.3			7.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.84	0.85	0.92	0.50	0.84	0.86	0.54	0.85	0.50	0.75	0.94	0.82
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)	0	0	0									
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	161	96	128	4	292	243	48	100	4	24	311	124
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	385	0	0	296	243	0	152	0	0	459	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	10.5	28.5		28.5	28.5	28.5	26.0	26.0		26.0	26.0	
Total Split (s)	10.5	39.0		28.5	28.5	28.5	26.0	26.0		26.0	26.0	
Total Split (%)	16.2%	60.0%		43.8%	43.8%	43.8%	40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	5.0	33.5		23.0	23.0	23.0	19.0	19.0		19.0	19.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	5.0	5.0		5.0	5.0	
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.5			-1.5	-1.5		-1.5			-1.5	
Total Lost Time (s)		4.0			4.0	4.0		5.5			5.5	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	5.0	5.0		5.0	5.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	2.5	2.5		2.5	2.5	

Lanes, Volumes, Timings
24: 5th St & Sarah St

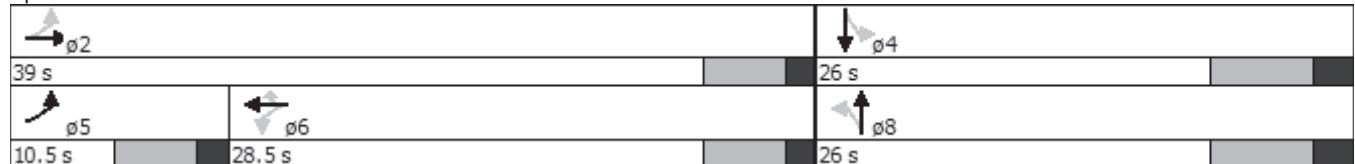
Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

Lane Group												
Time Before Reduce (s)	0.0	0.0		3.0	3.0	3.0	26.0	26.0		26.0	26.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	10.0	10.0		10.0	10.0	
Recall Mode	None	None		None	None	None	Min	Min		Min	Min	
Walk Time (s)		11.0		11.0	11.0	11.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		12.0		12.0	12.0	12.0	12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)		1		1	1	1	1	1		1	1	
Act Effct Green (s)		22.8			22.8	22.8		15.7			15.7	
Actuated g/C Ratio		0.47			0.47	0.47		0.32			0.32	
v/c Ratio		0.61			0.39	0.31		0.42			0.73	
Control Delay		12.9			10.2	2.5		19.4			23.6	
Queue Delay		0.0			0.0	0.0		0.0			0.0	
Total Delay		12.9			10.2	2.5		19.4			23.6	
LOS		B			B	A		B			C	
Approach Delay		12.9			6.7			19.4			23.6	
Approach LOS		B			A			B			C	
Queue Length 50th (ft)		61			50	0		33			105	
Queue Length 95th (ft)		130			96	24		89			#280	
Internal Link Dist (ft)		367			399			396			280	
Turn Bay Length (ft)						150						
Base Capacity (vph)		969			980	935		512			881	
Starvation Cap Reductn		0			0	0		0			0	
Spillback Cap Reductn		0			0	0		0			0	
Storage Cap Reductn		0			0	0		0			0	
Reduced v/c Ratio		0.40			0.30	0.26		0.30			0.52	

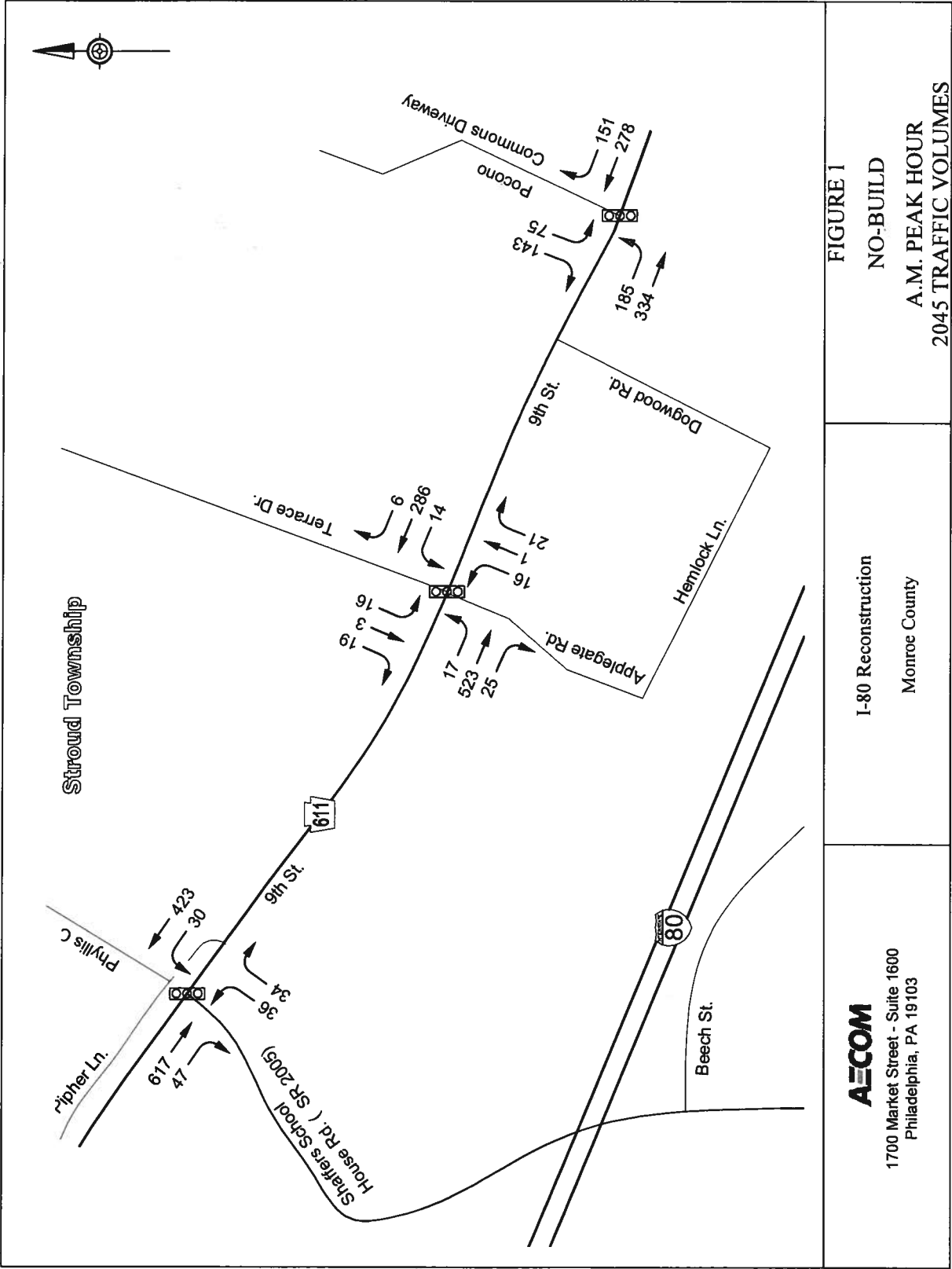
Intersection Summary

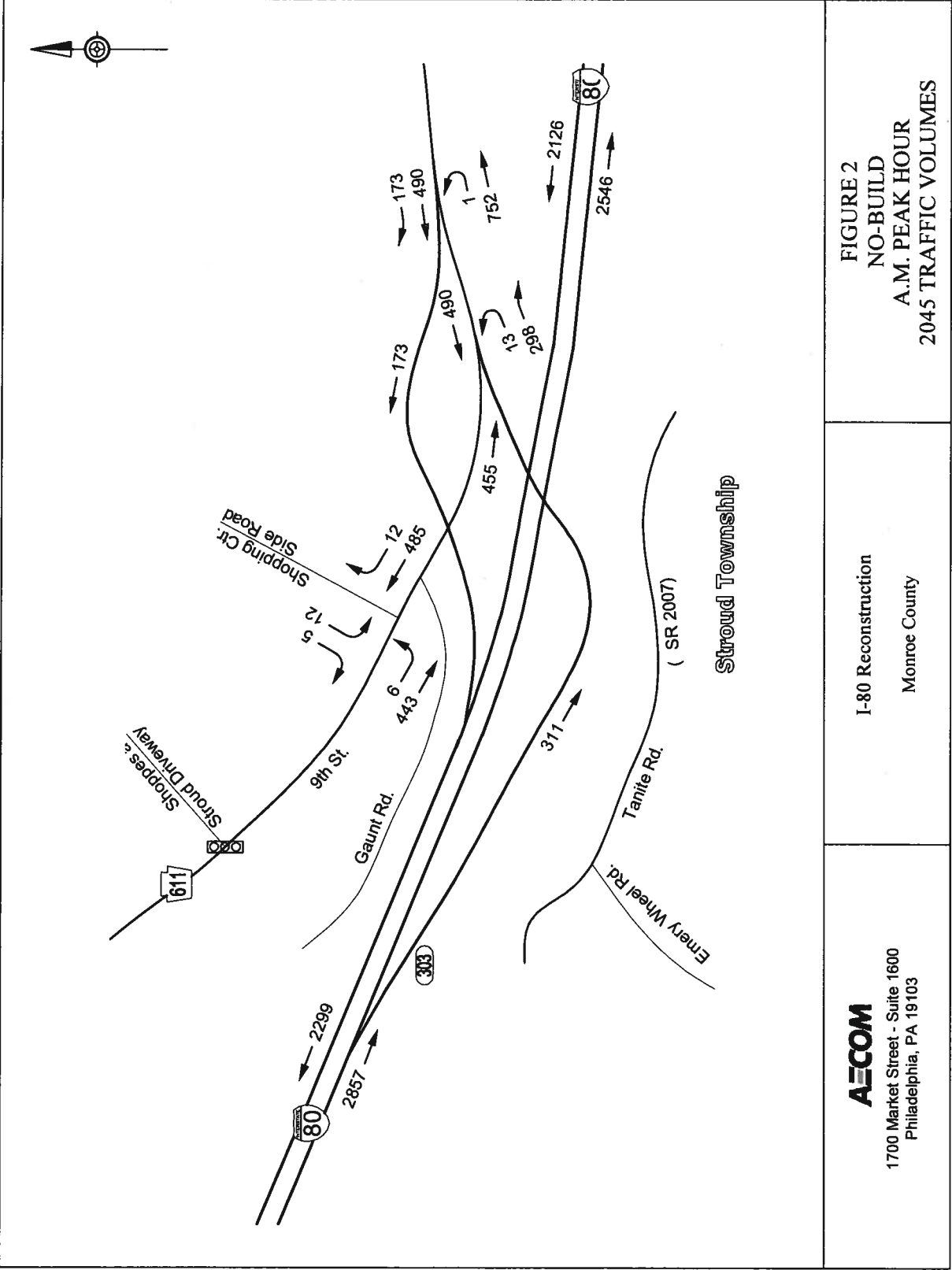
Area Type: CBD
 Cycle Length: 65
 Actuated Cycle Length: 48.8
 Natural Cycle: 65
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.73
 Intersection Signal Delay: 14.6
 Intersection Capacity Utilization 73.0%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service D
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 24: 5th St & Sarah St



HCM 2010 analysis expects stop-line detection. Detectors can not be further than 20 feet from the stop bar.





AECOM

1700 Market Street - Suite 1600
Philadelphia, PA 19103

I-80 Reconstruction

Monroe County

FIGURE 2
NO-BUILD
A.M. PEAK HOUR
2045 TRAFFIC VOLUMES

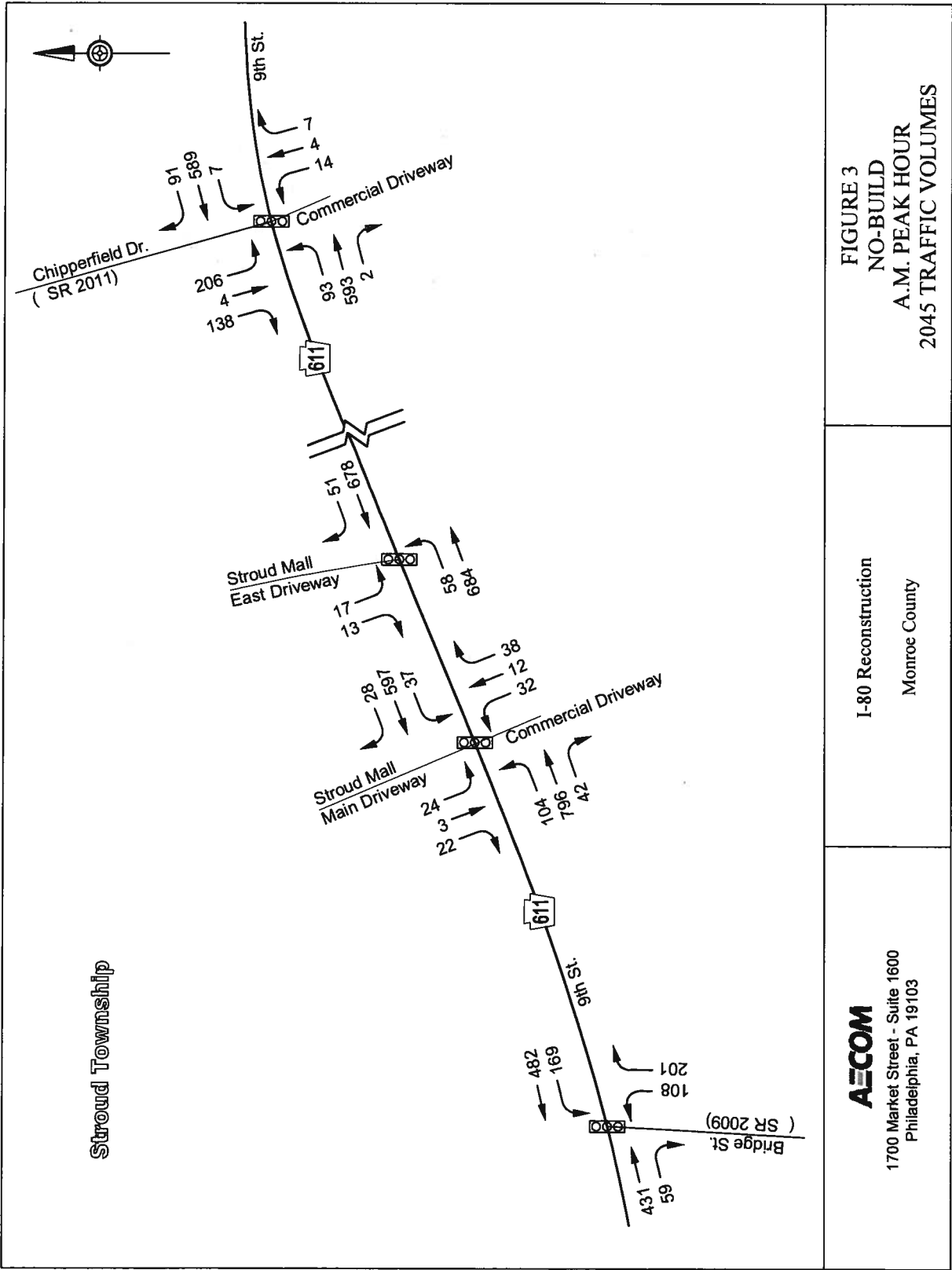


FIGURE 3
NO-BUILD
A.M. PEAK HOUR
2045 TRAFFIC VOLUMES

I-80 Reconstruction
Monroe County

AECOM
 1700 Market Street - Suite 1600
 Philadelphia, PA 19103

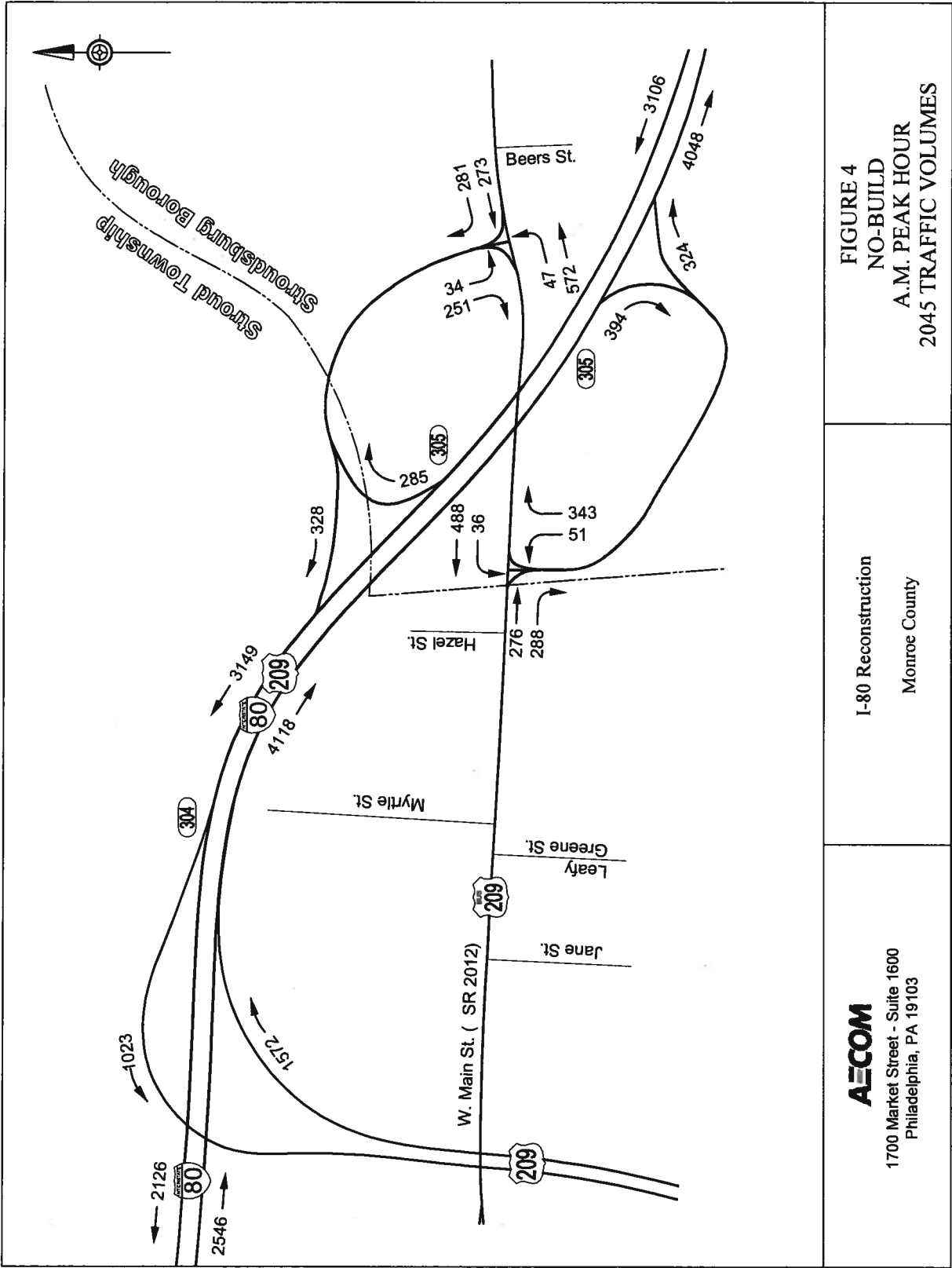


FIGURE 4
NO-BUILD
A.M. PEAK HOUR
2045 TRAFFIC VOLUMES

I-80 Reconstruction
 Monroe County



1700 Market Street - Suite 1600
 Philadelphia, PA 19103

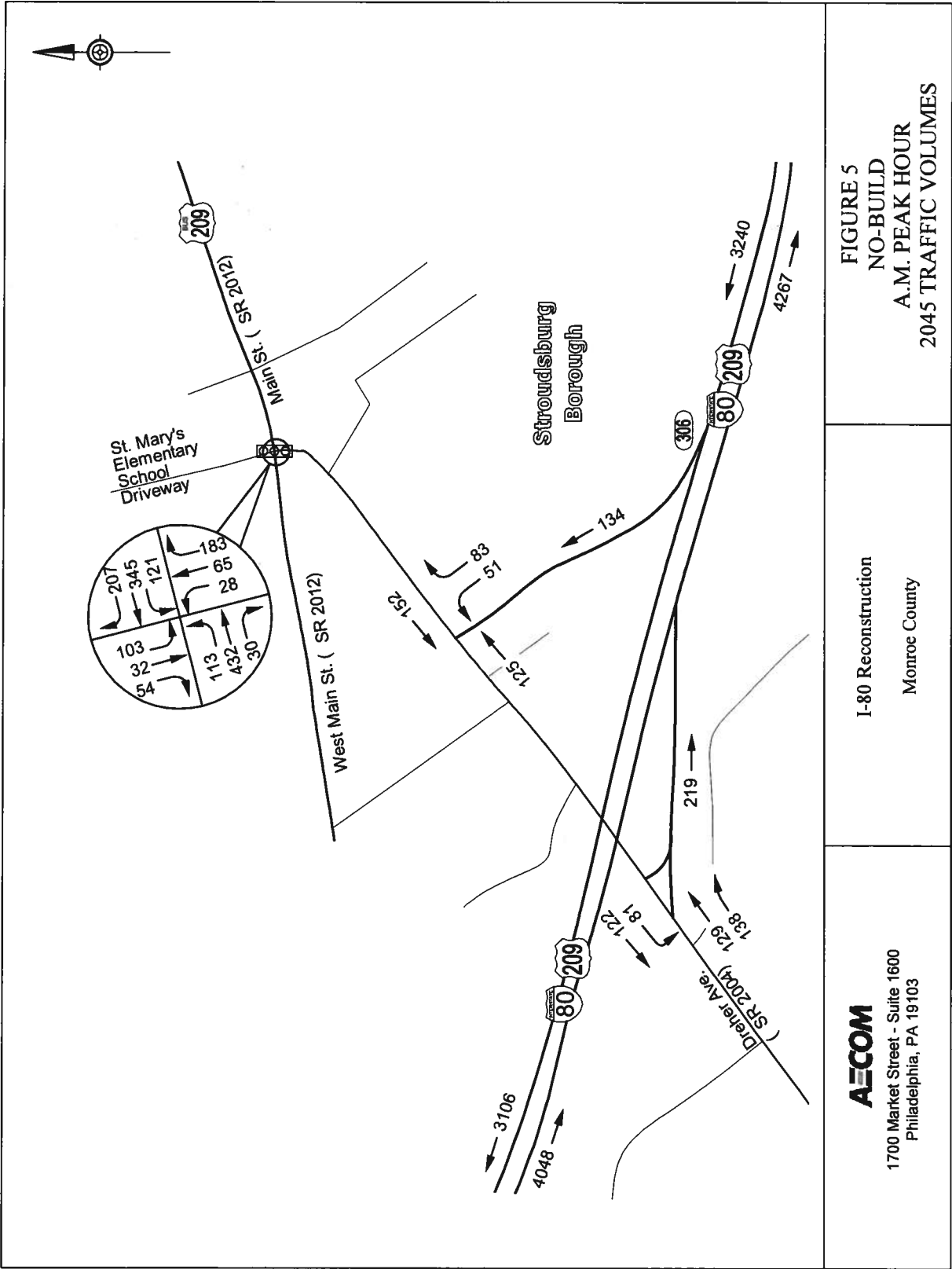


FIGURE 5
NO-BUILD
A.M. PEAK HOUR
2045 TRAFFIC VOLUMES

I-80 Reconstruction
 Monroe County

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 1700 Market Street - Suite 1600
 Philadelphia, PA 19103

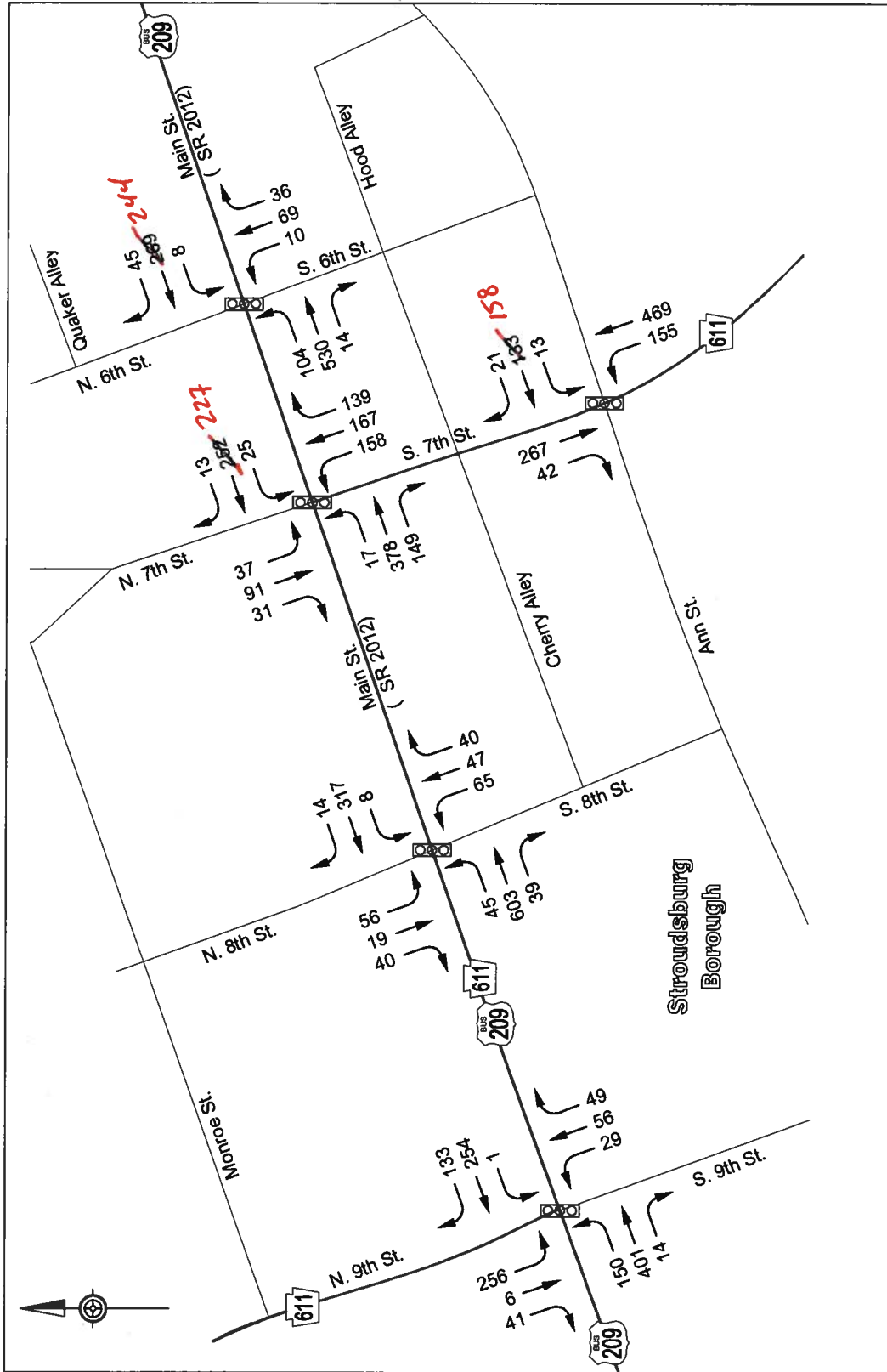
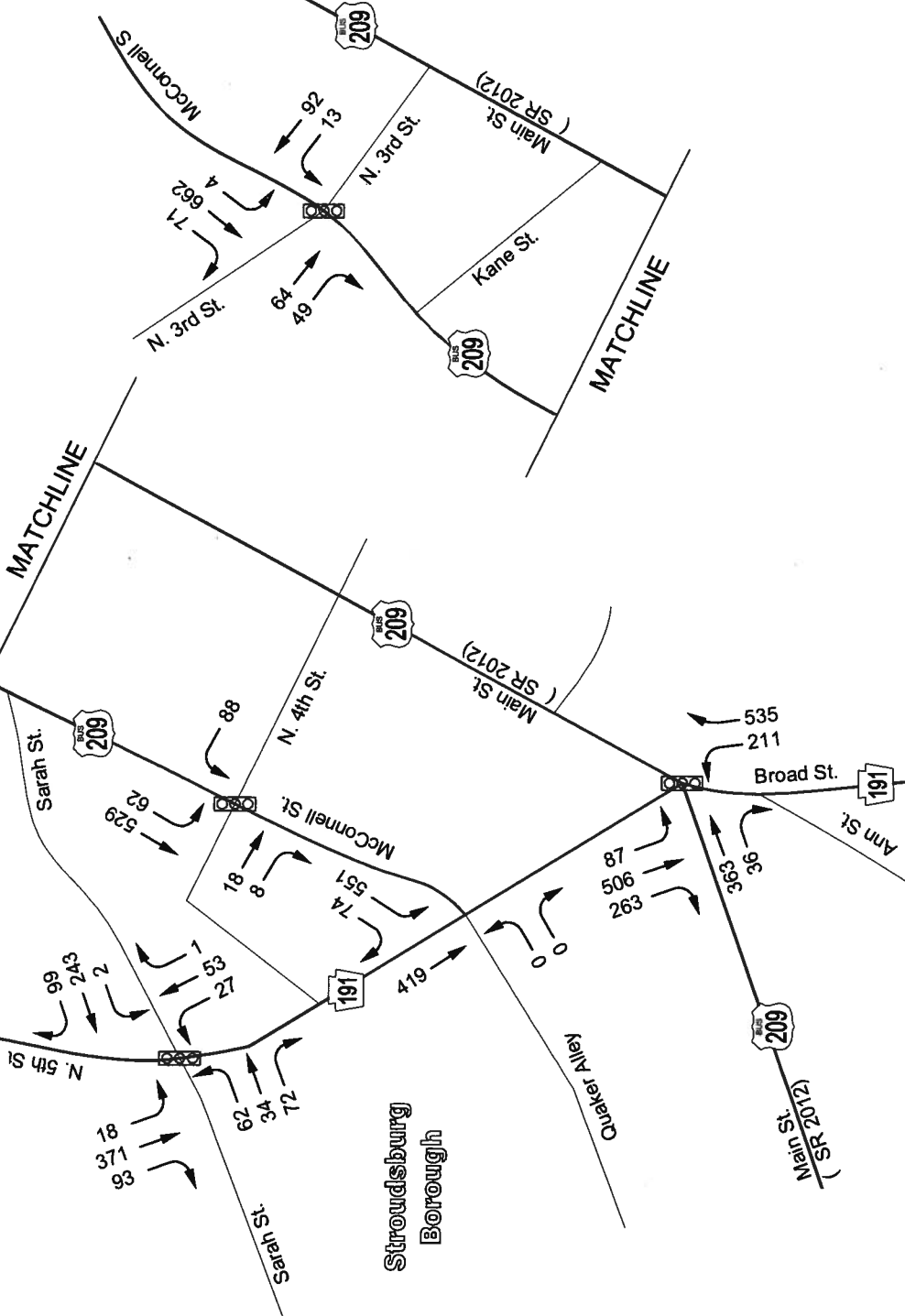
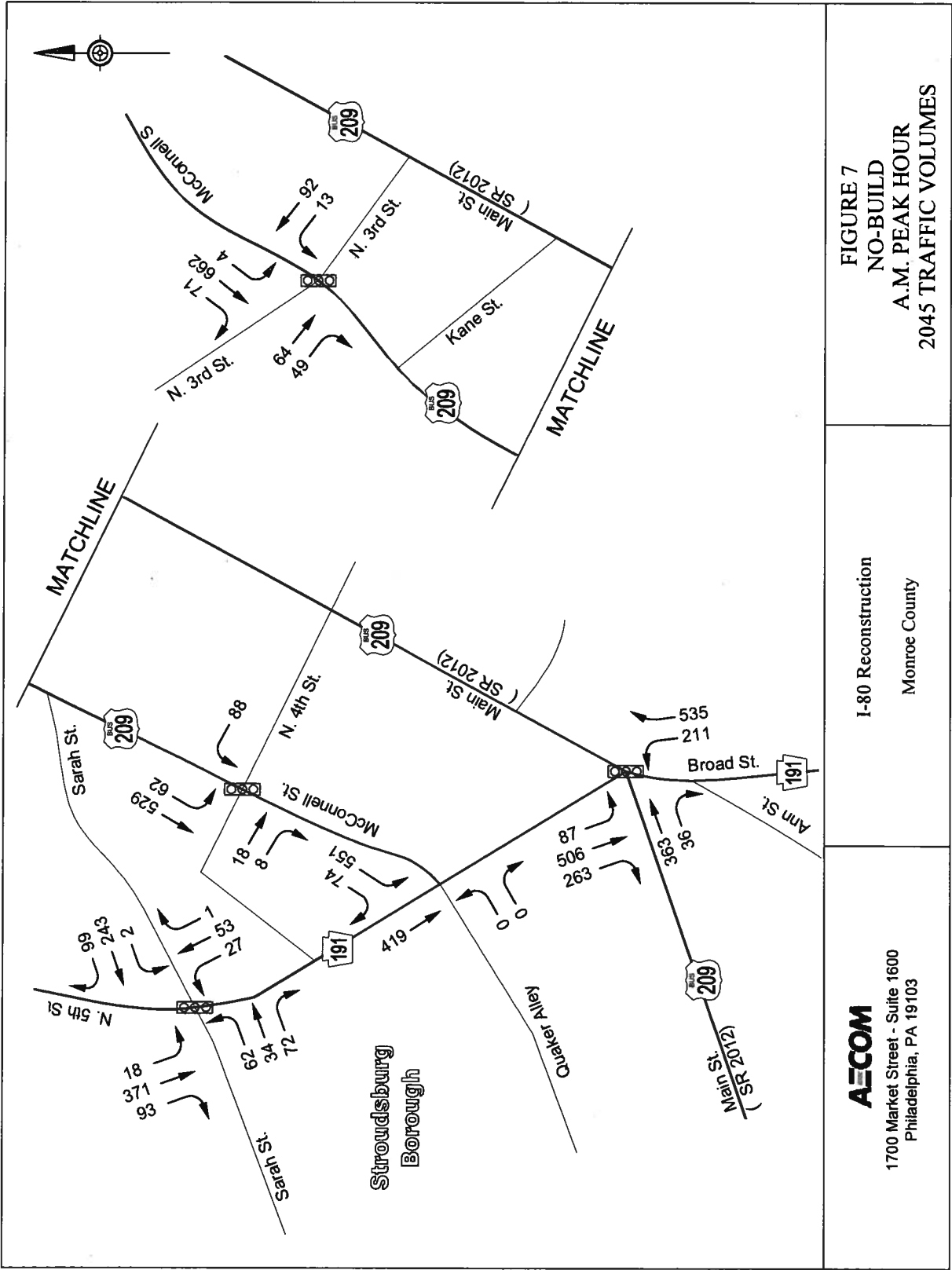
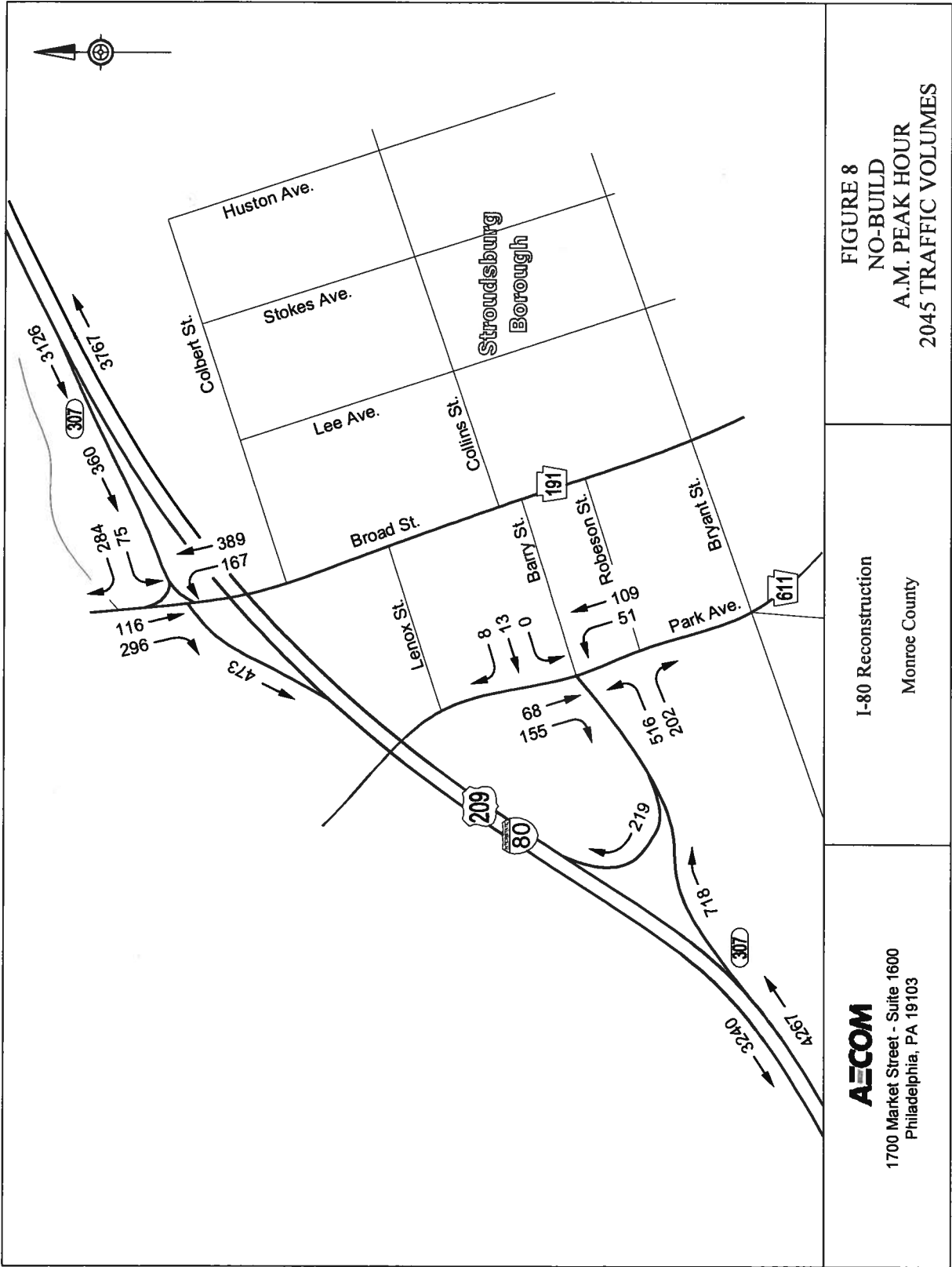


FIGURE 6
NO-BUILD
A.M. PEAK HOUR
2045 TRAFFIC VOLUMES

I-80 Reconstruction
 Monroe County

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 Philadelphia, PA 19103





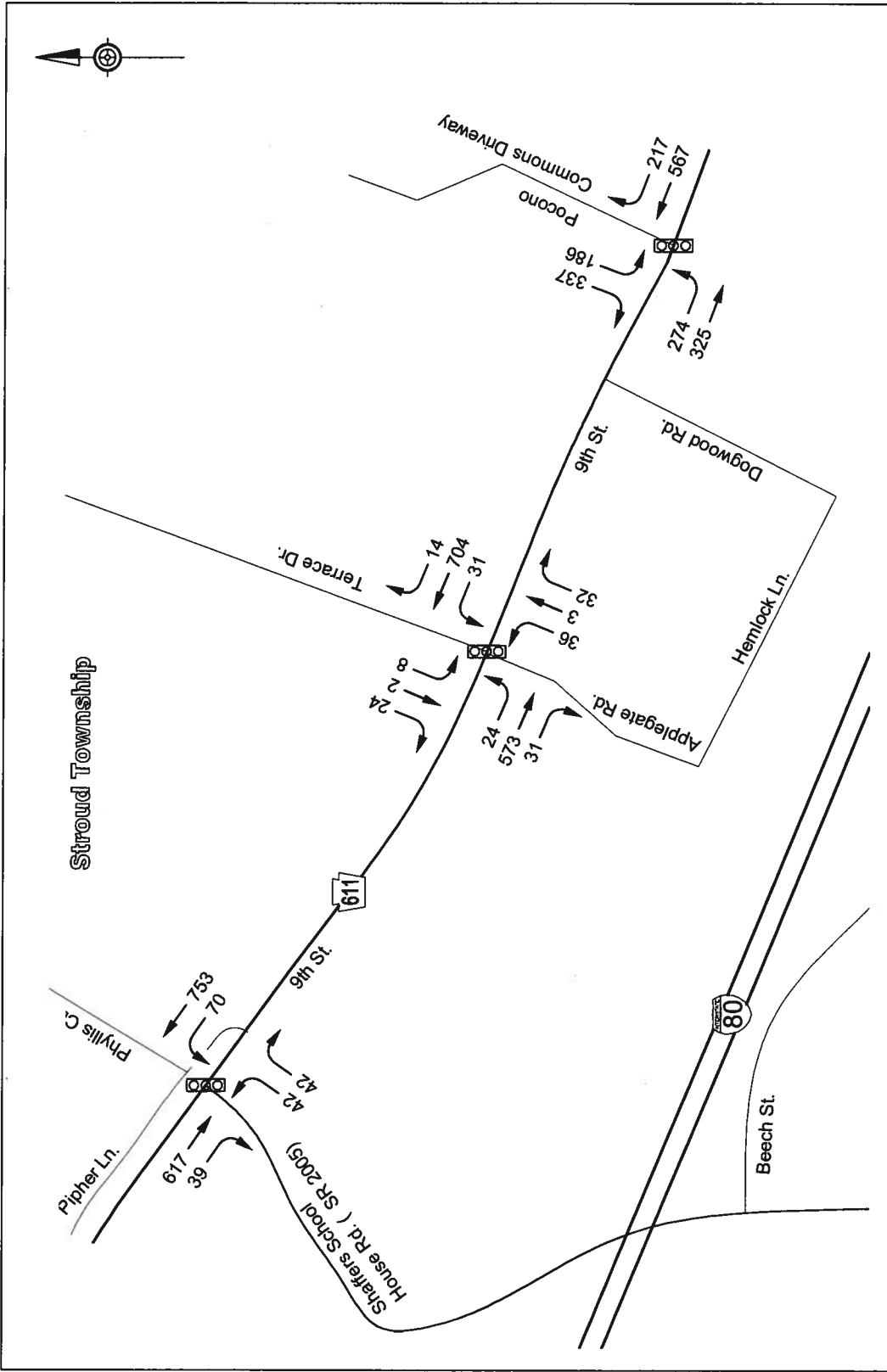


FIGURE 9
NO-BUILD
P.M. PEAK HOUR
2045 TRAFFIC VOLUMES

I-80 Reconstruction
Monroe County

AECOM
 1700 Market Street - Suite 1600
 Philadelphia, PA 19103

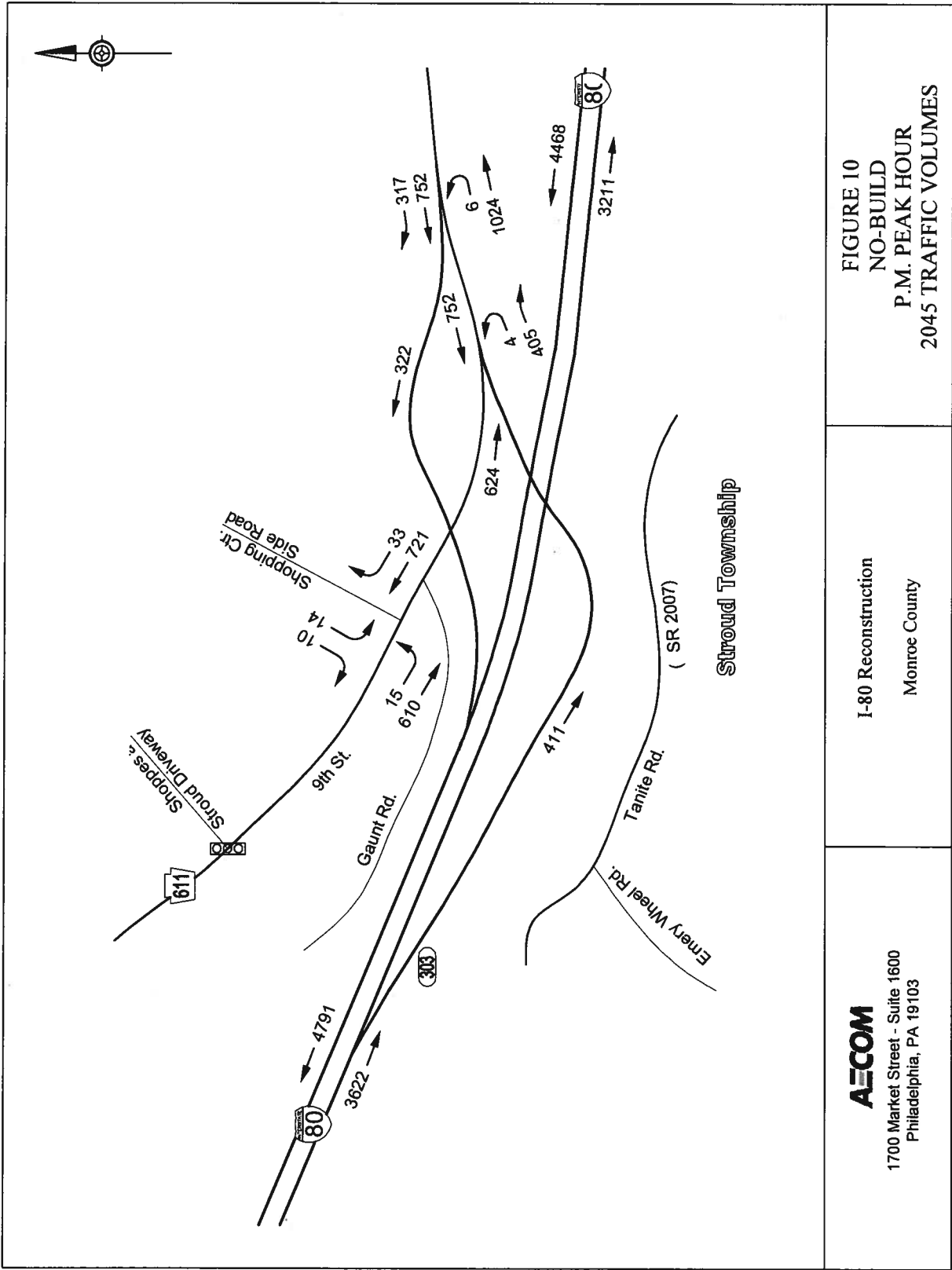


FIGURE 10
NO-BUILD
P.M. PEAK HOUR
2045 TRAFFIC VOLUMES

I-80 Reconstruction
 Monroe County

AECOM
 1700 Market Street - Suite 1600
 Philadelphia, PA 19103

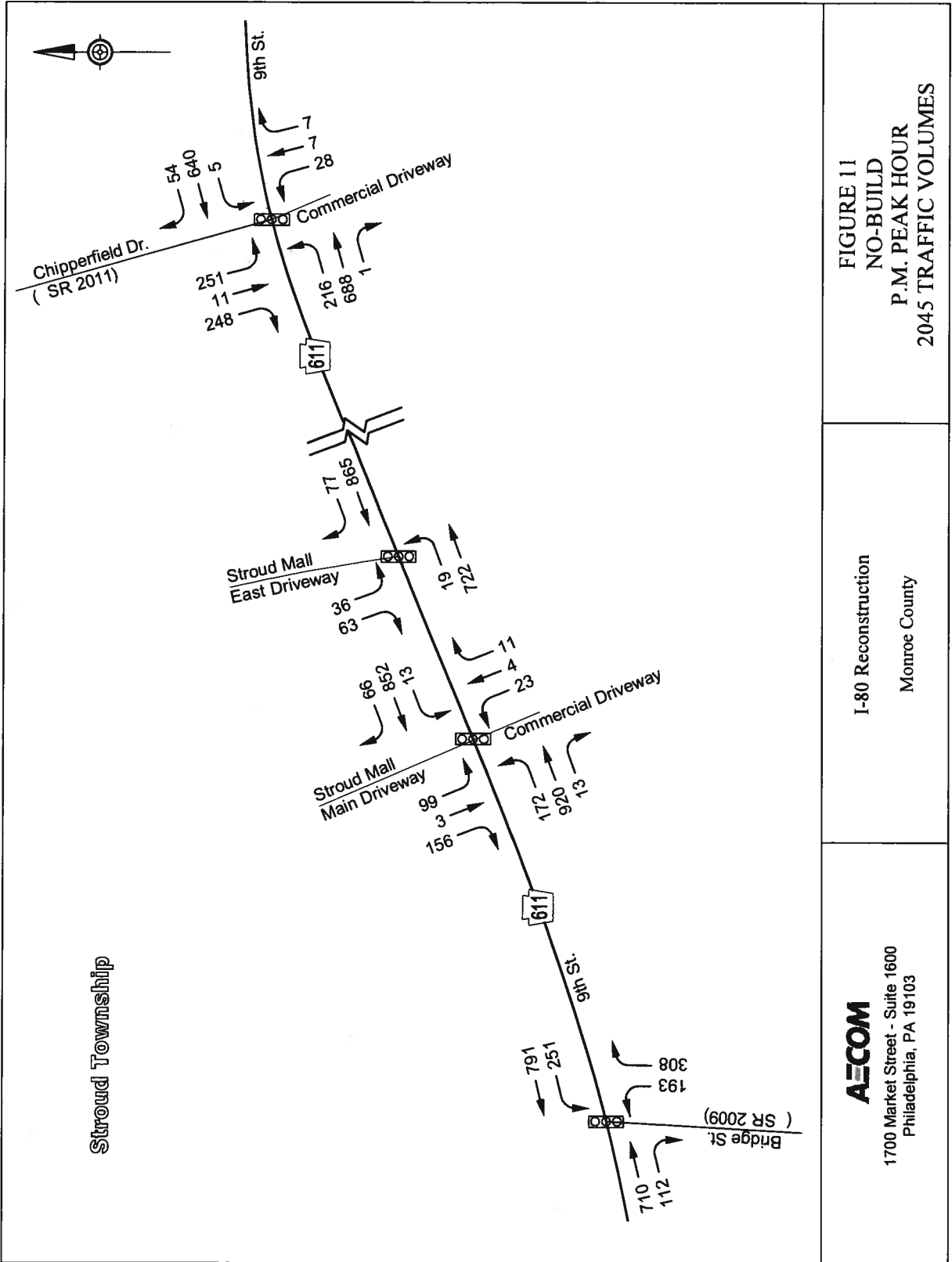
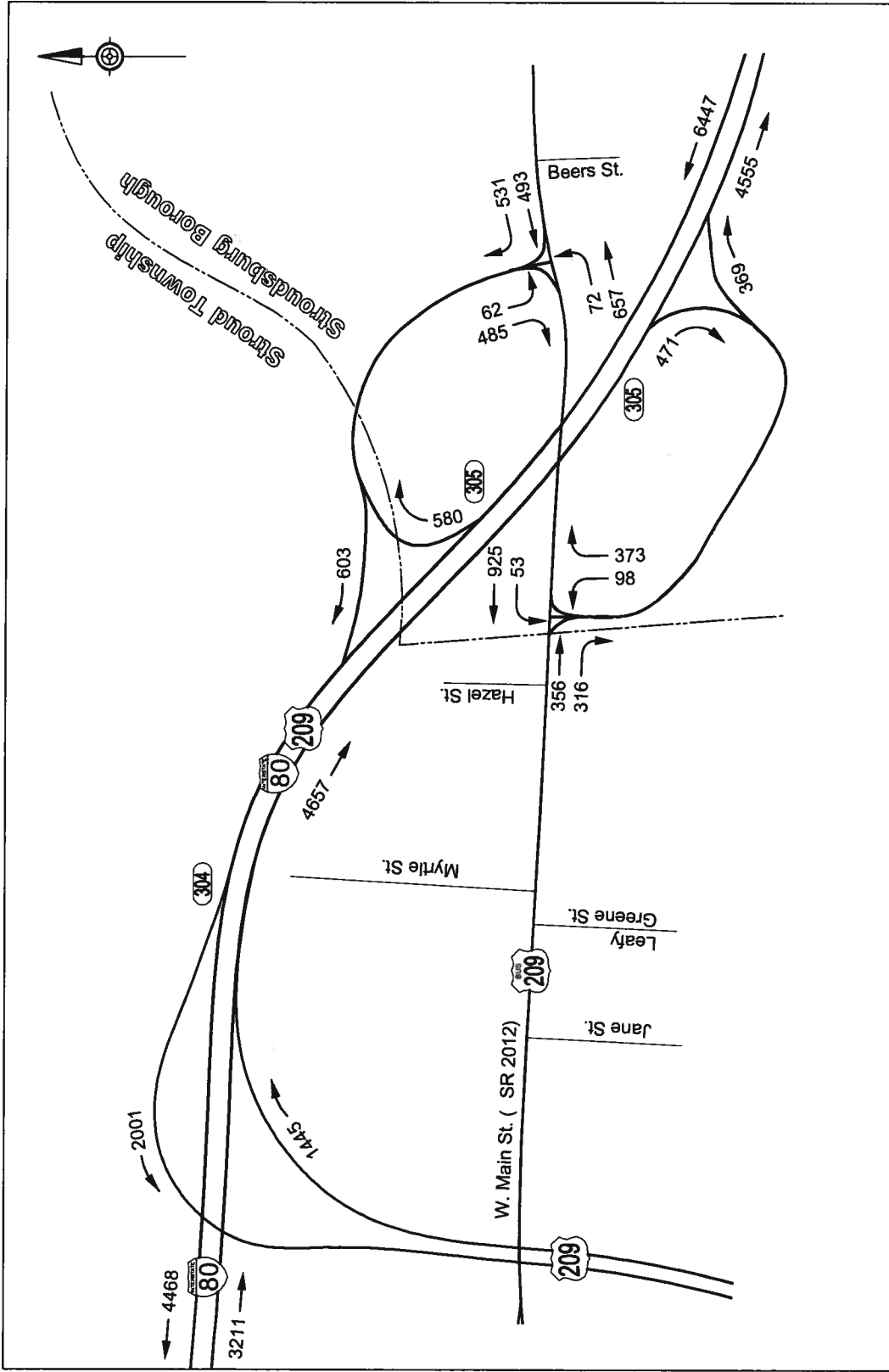


FIGURE 11
NO-BUILD
P.M. PEAK HOUR
2045 TRAFFIC VOLUMES

I-80 Reconstruction
 Monroe County

AECOM
 1700 Market Street - Suite 1600
 Philadelphia, PA 19103



AECOM
 1700 Market Street - Suite 1600
 Philadelphia, PA 19103

I-80 Reconstruction
 Monroe County

FIGURE 12
NO-BUILD
P.M. PEAK HOUR
2045 TRAFFIC VOLUMES

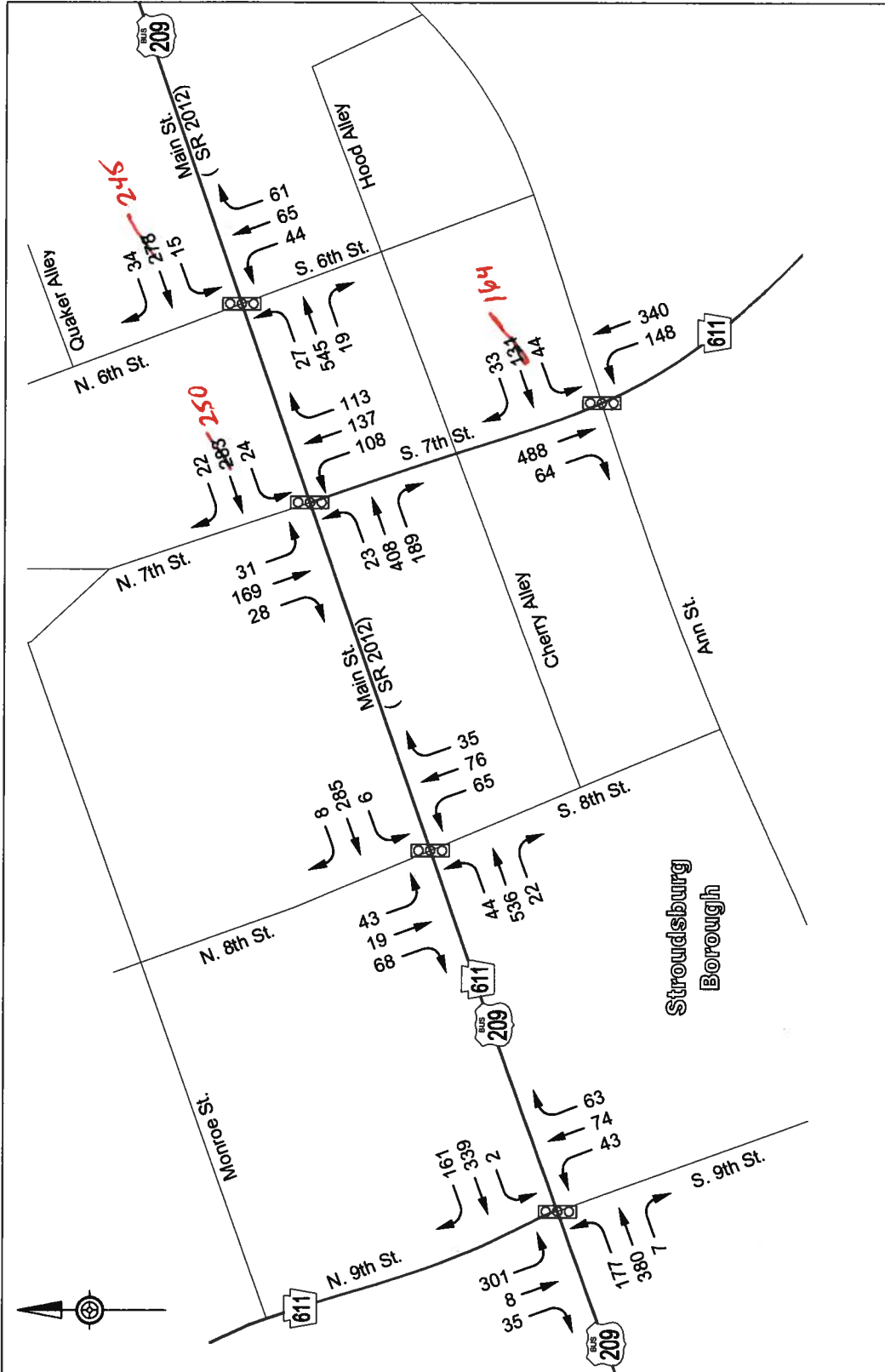
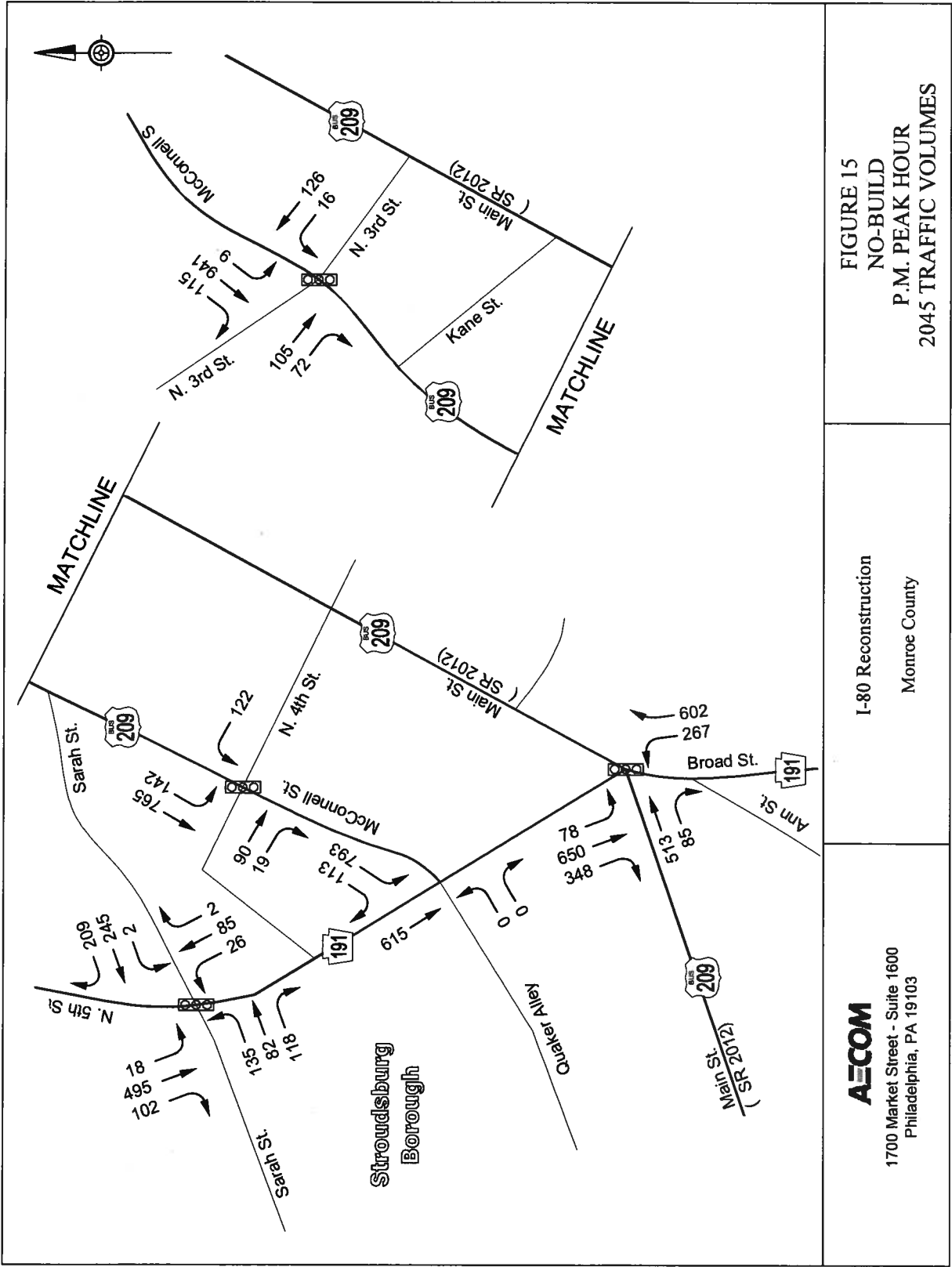
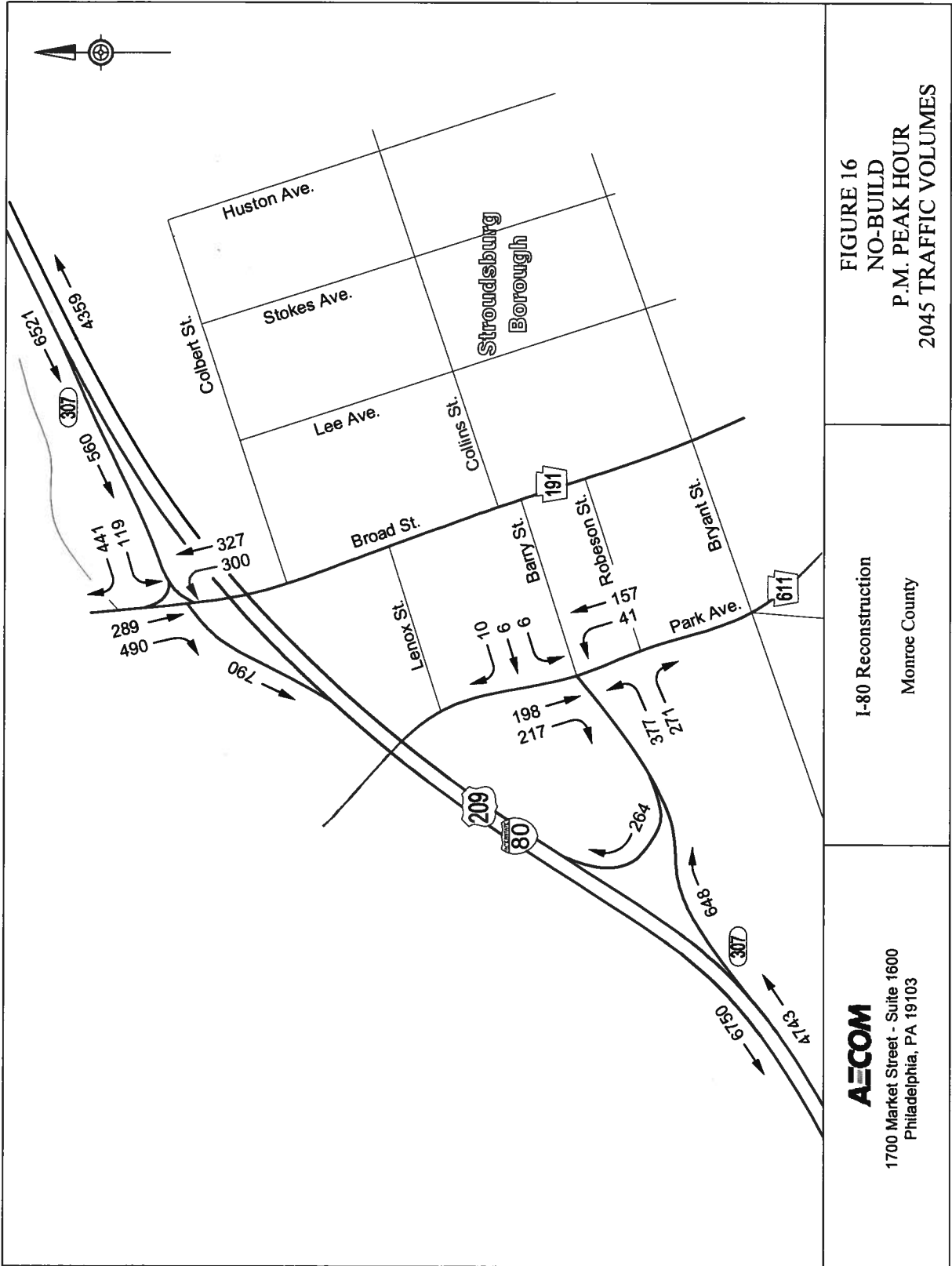


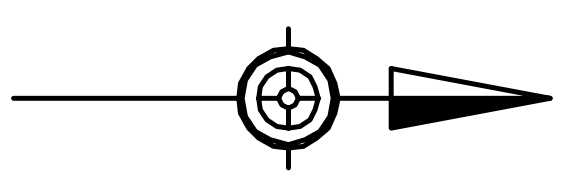
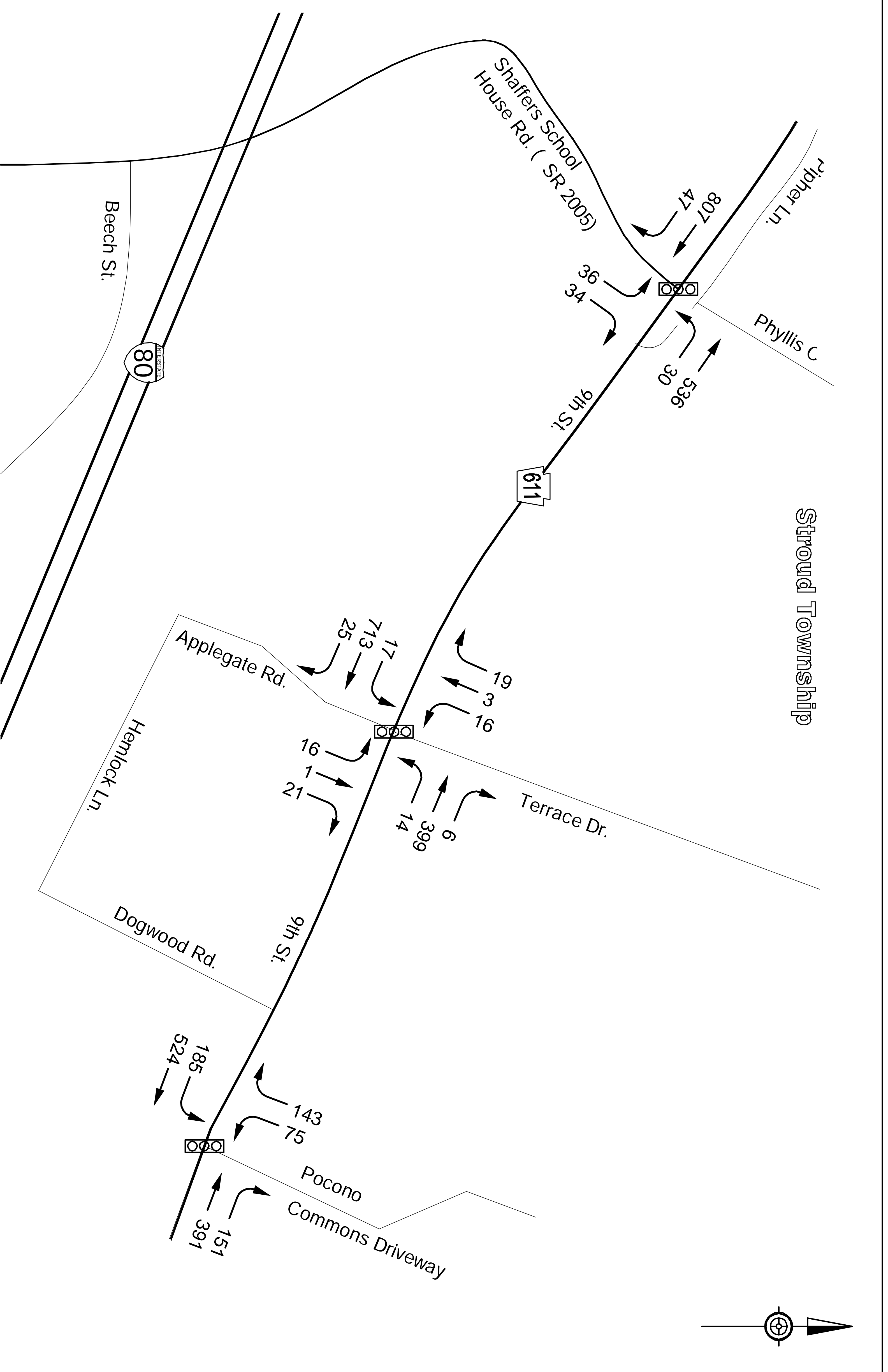
FIGURE 14
NO-BUILD
P.M. PEAK HOUR
2045 TRAFFIC VOLUMES

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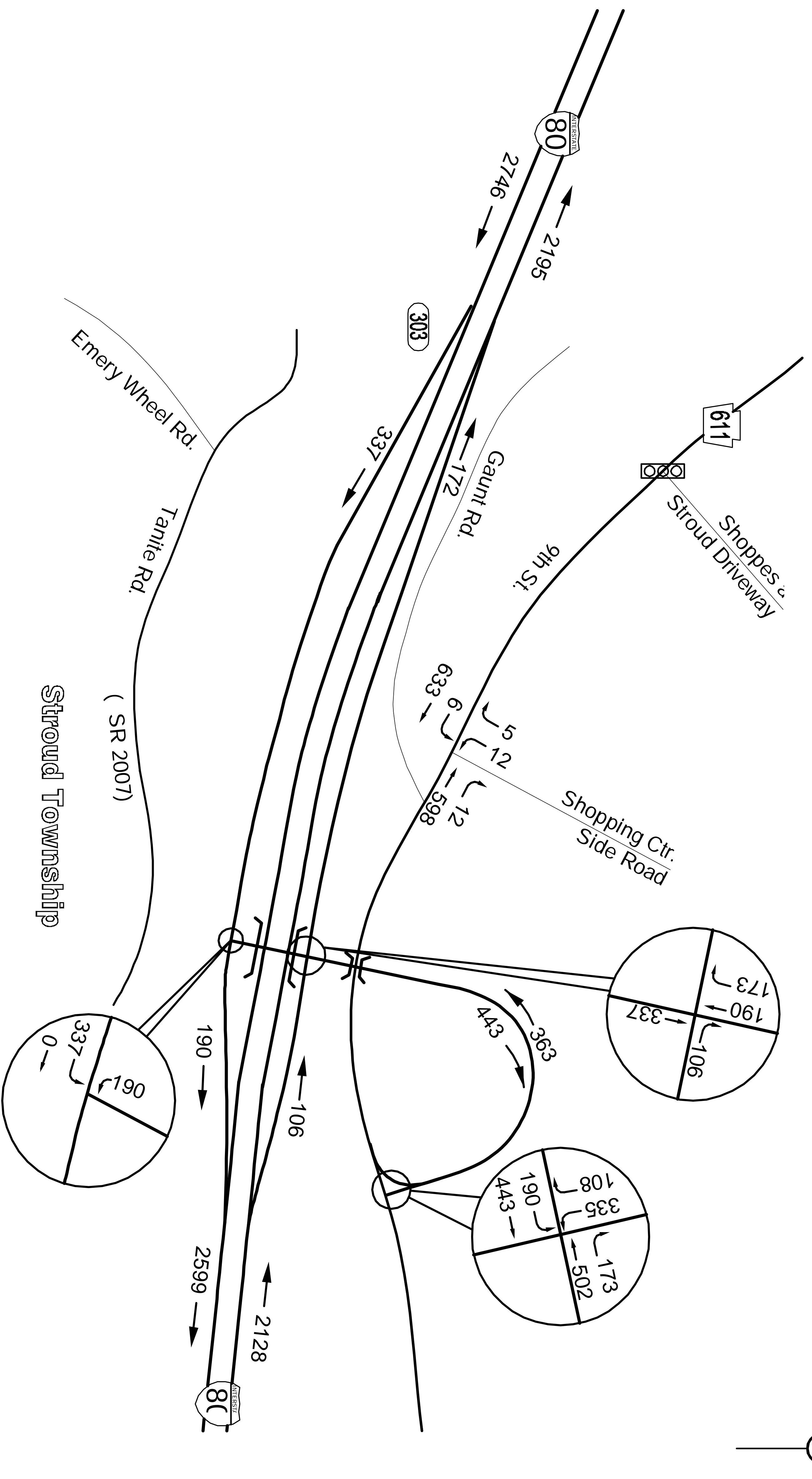




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 Monroe County

FIGURE 1
 ALTERNATIVE 2A PHASE II
 A.M. PEAK HOUR
 2045 TRAFFIC VOLUMES

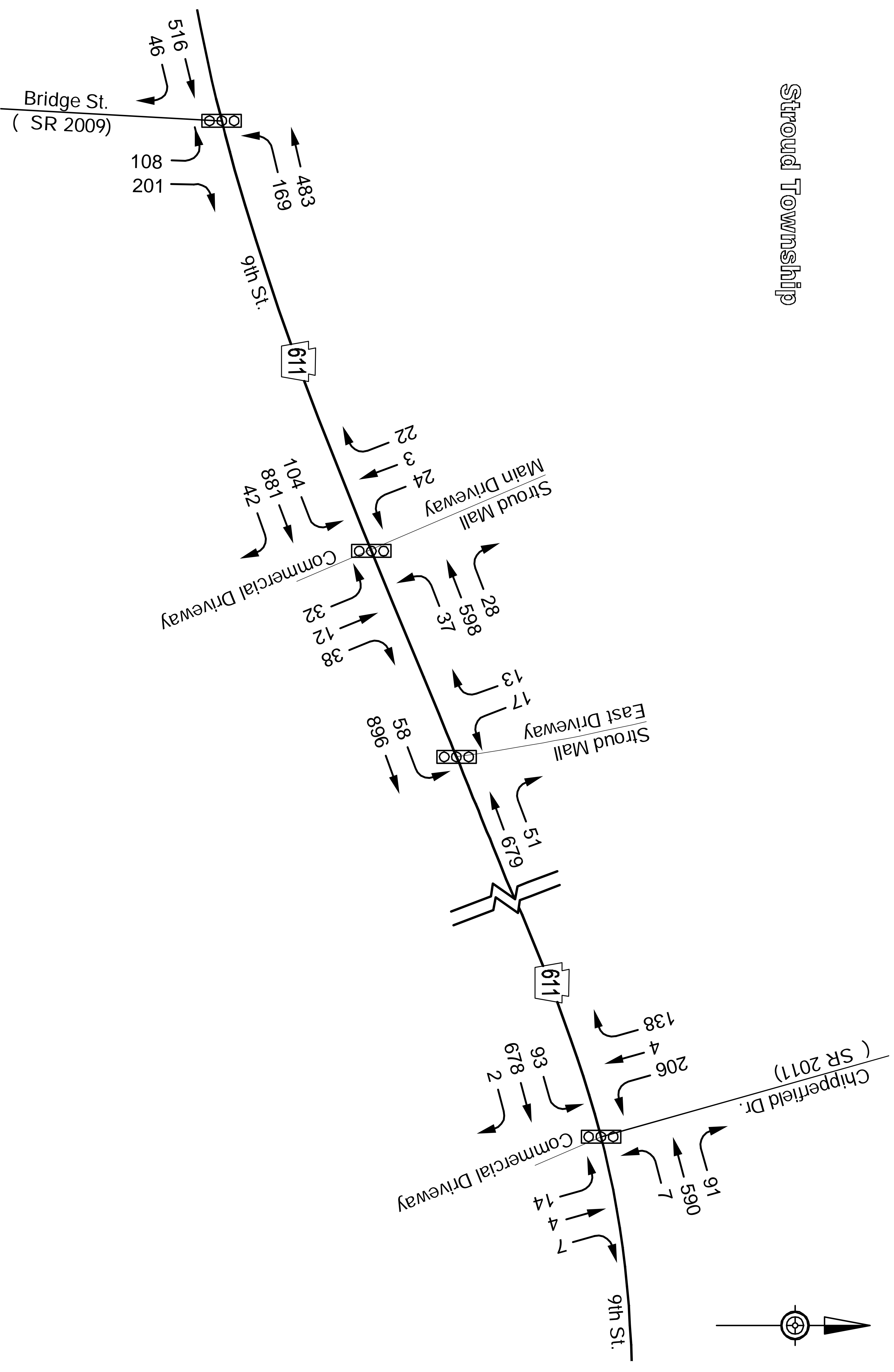
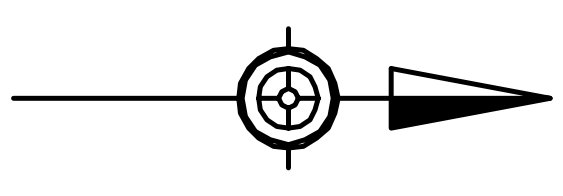


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FIGURE 2
 ALTERNATIVE 2A PHASE II
 A.M. PEAK HOUR
 2045 TRAFFIC VOLUMES

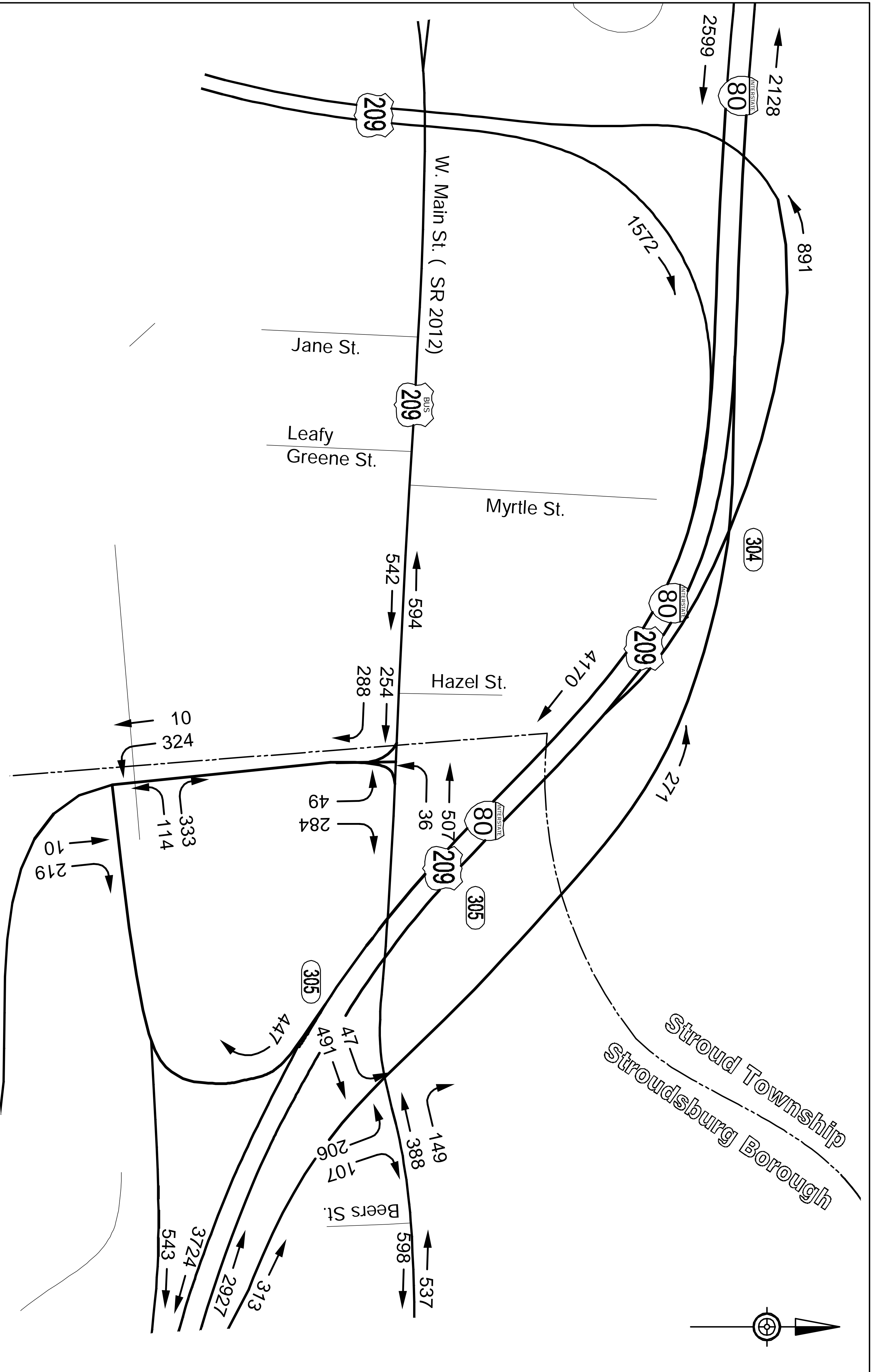
Stroud Township



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Monroe County

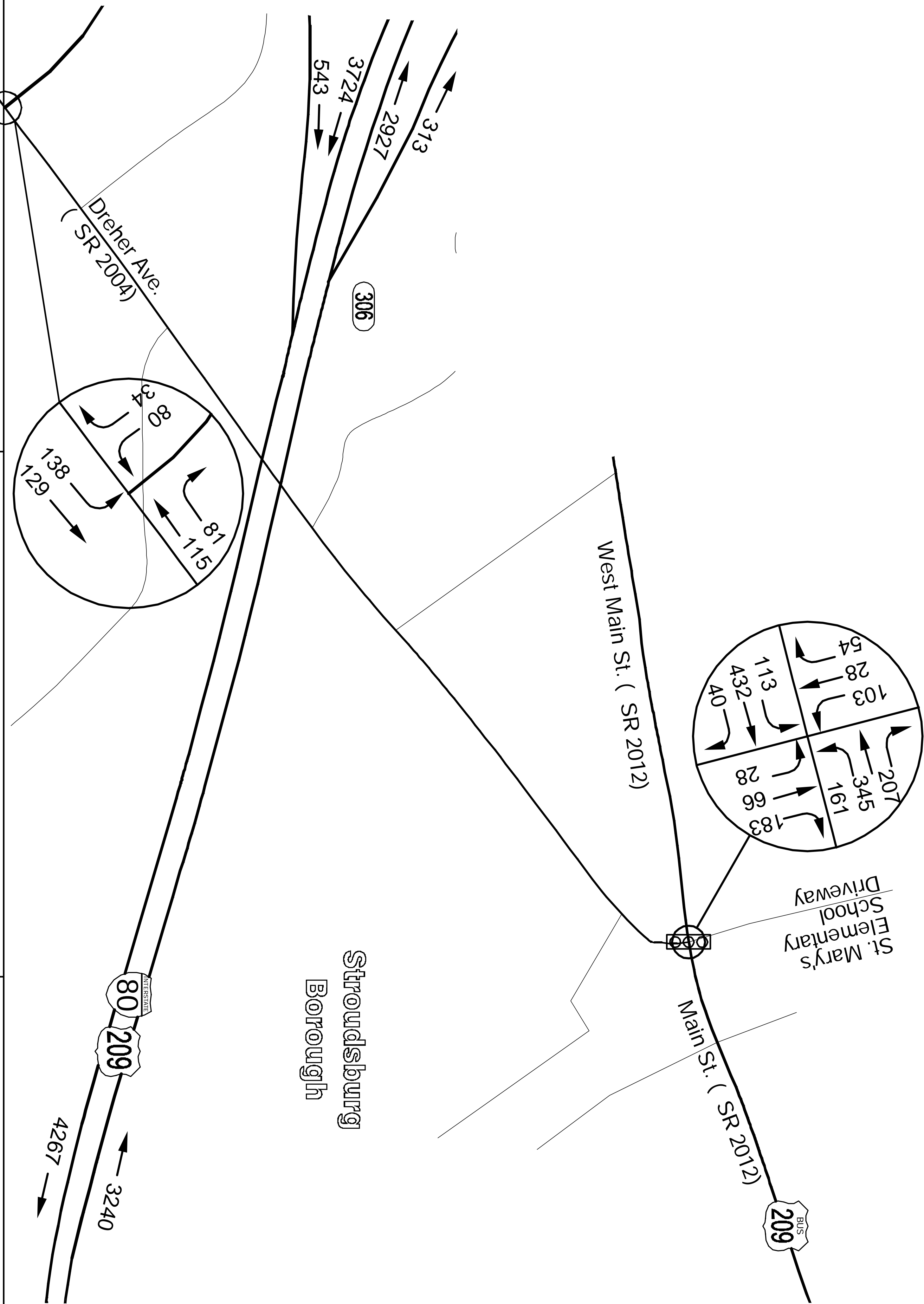
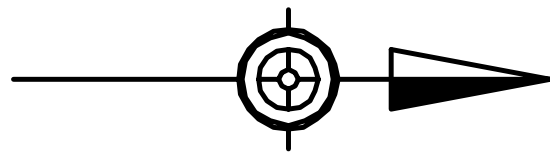
FIGURE 3
ALTERNATIVE 2A PHASE II
A.M. PEAK HOUR
2045 TRAFFIC VOLUMES



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FIGURE 4
 ALTERNATIVE 2A PHASE II
 A.M. PEAK HOUR
 2045 TRAFFIC VOLUMES



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FIGURE 5
ALTERNATIVE 2A PHASE II
A.M. PEAK HOUR
2045 TRAFFIC VOLUMES

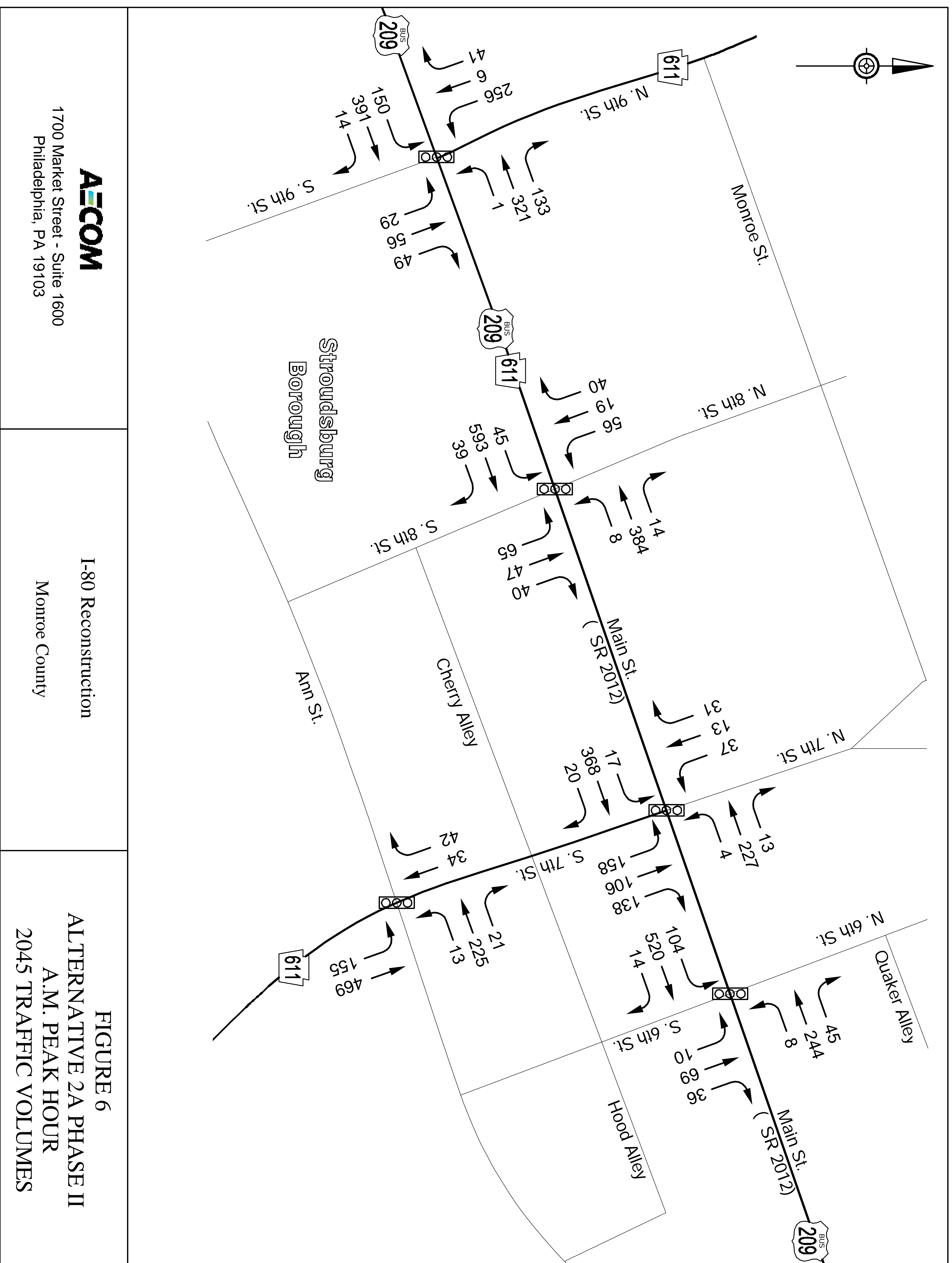
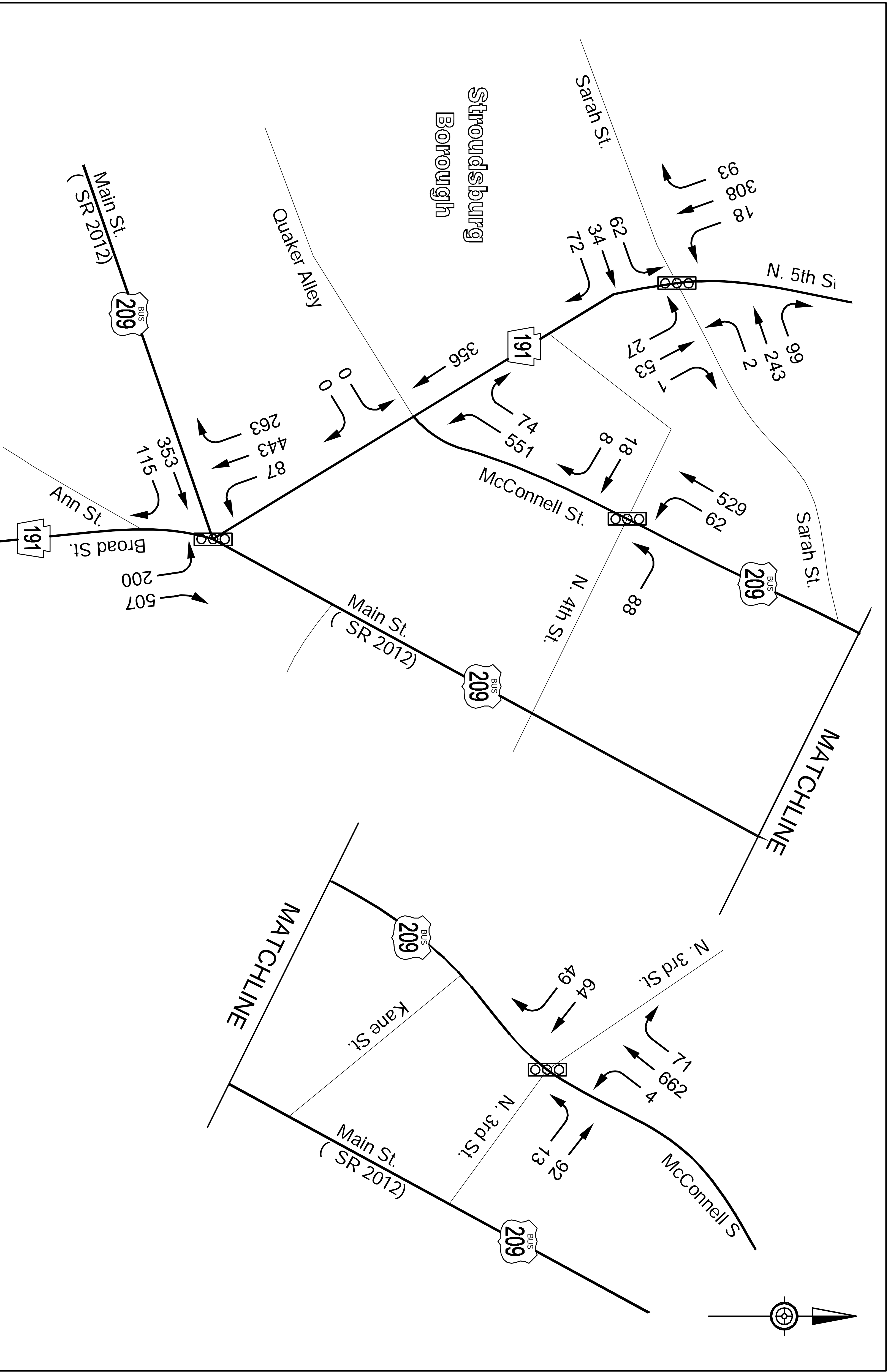


FIGURE 6
ALTERNATIVE 2A PHASE II
A.M. PEAK HOUR
2045 TRAFFIC VOLUMES

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 Monroe County

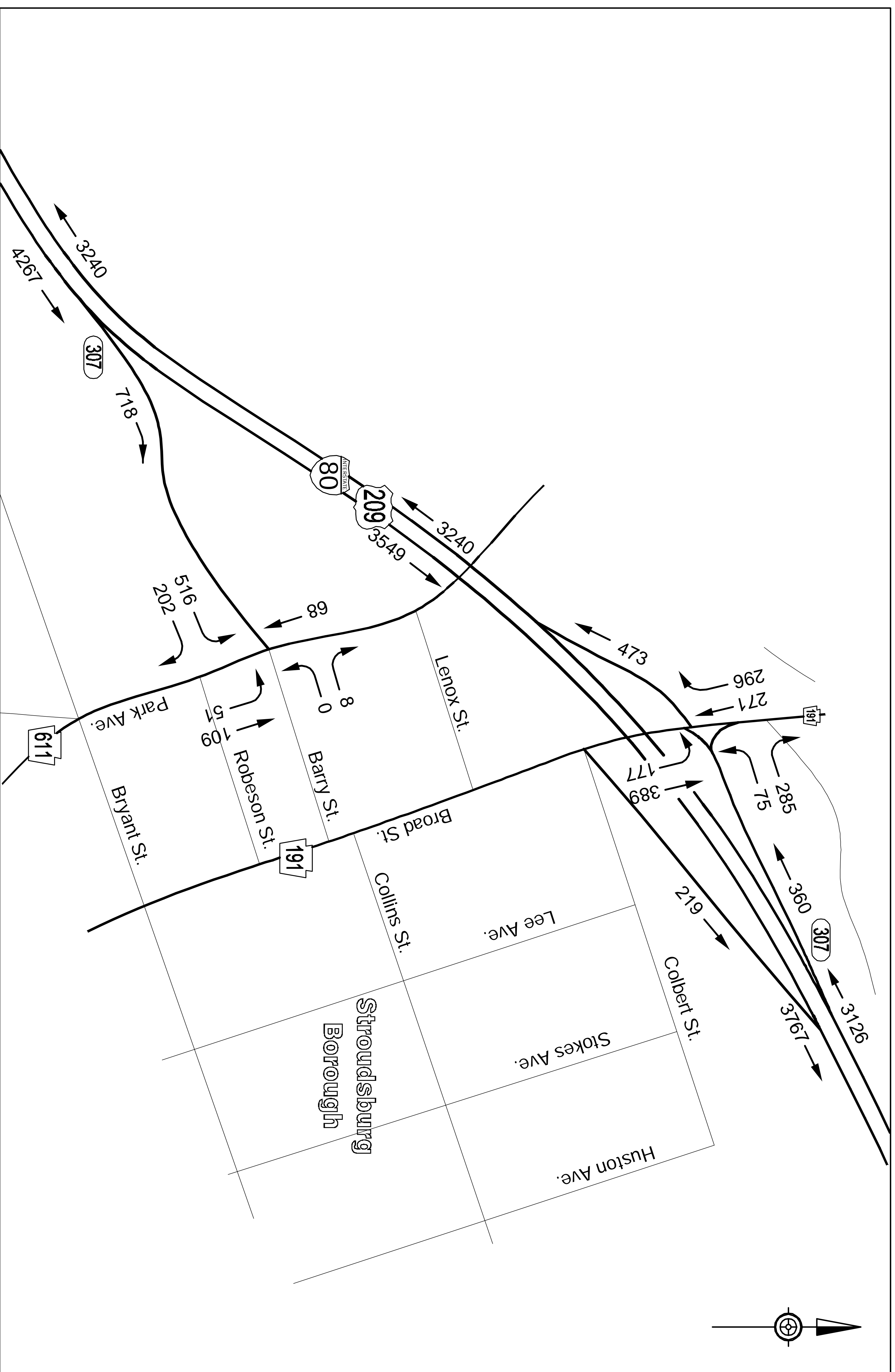


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Monroe County

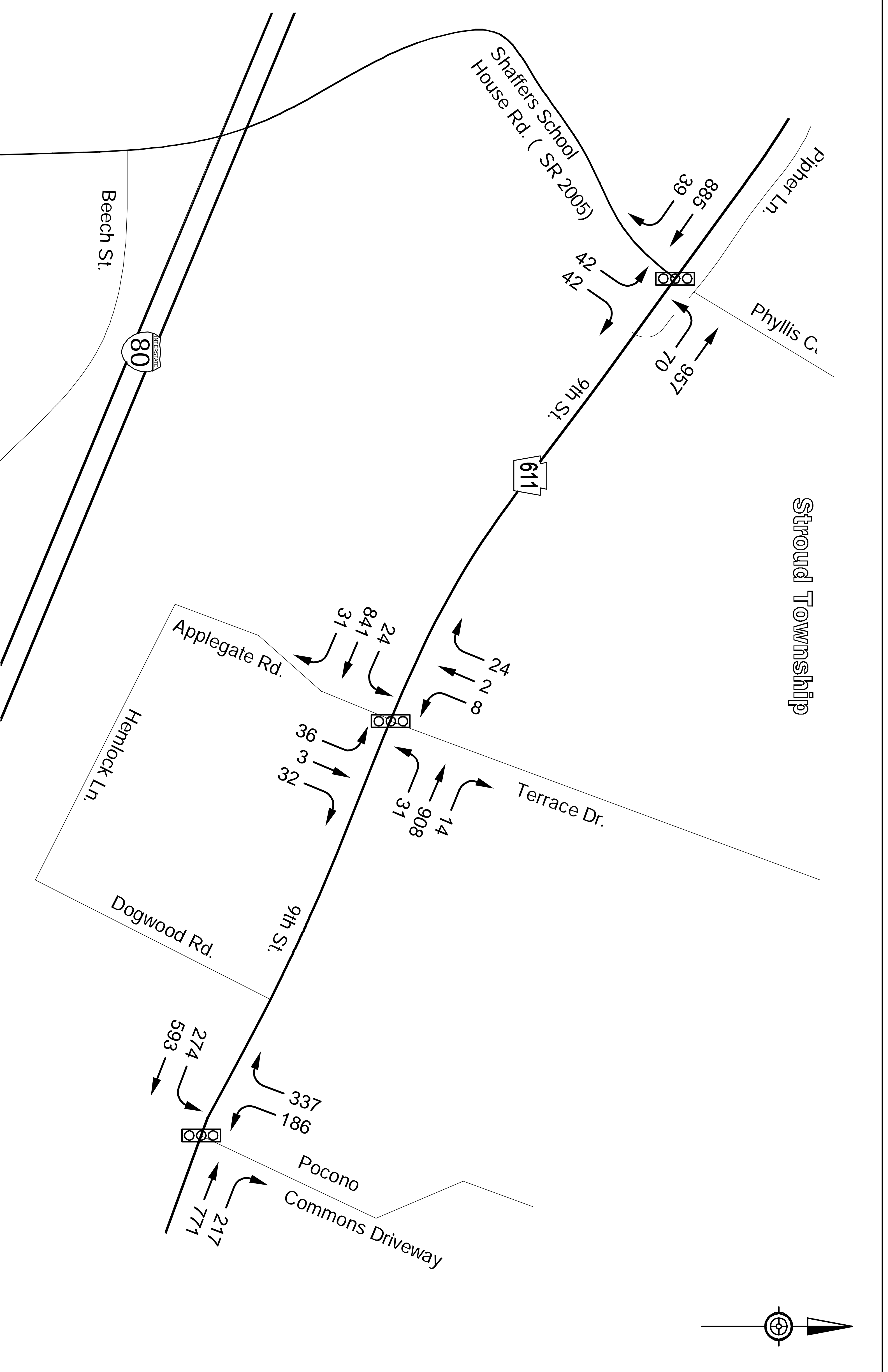
FIGURE 7
ALTERNATIVE 2A PHASE II
A.M. PEAK HOUR
2045 TRAFFIC VOLUMES



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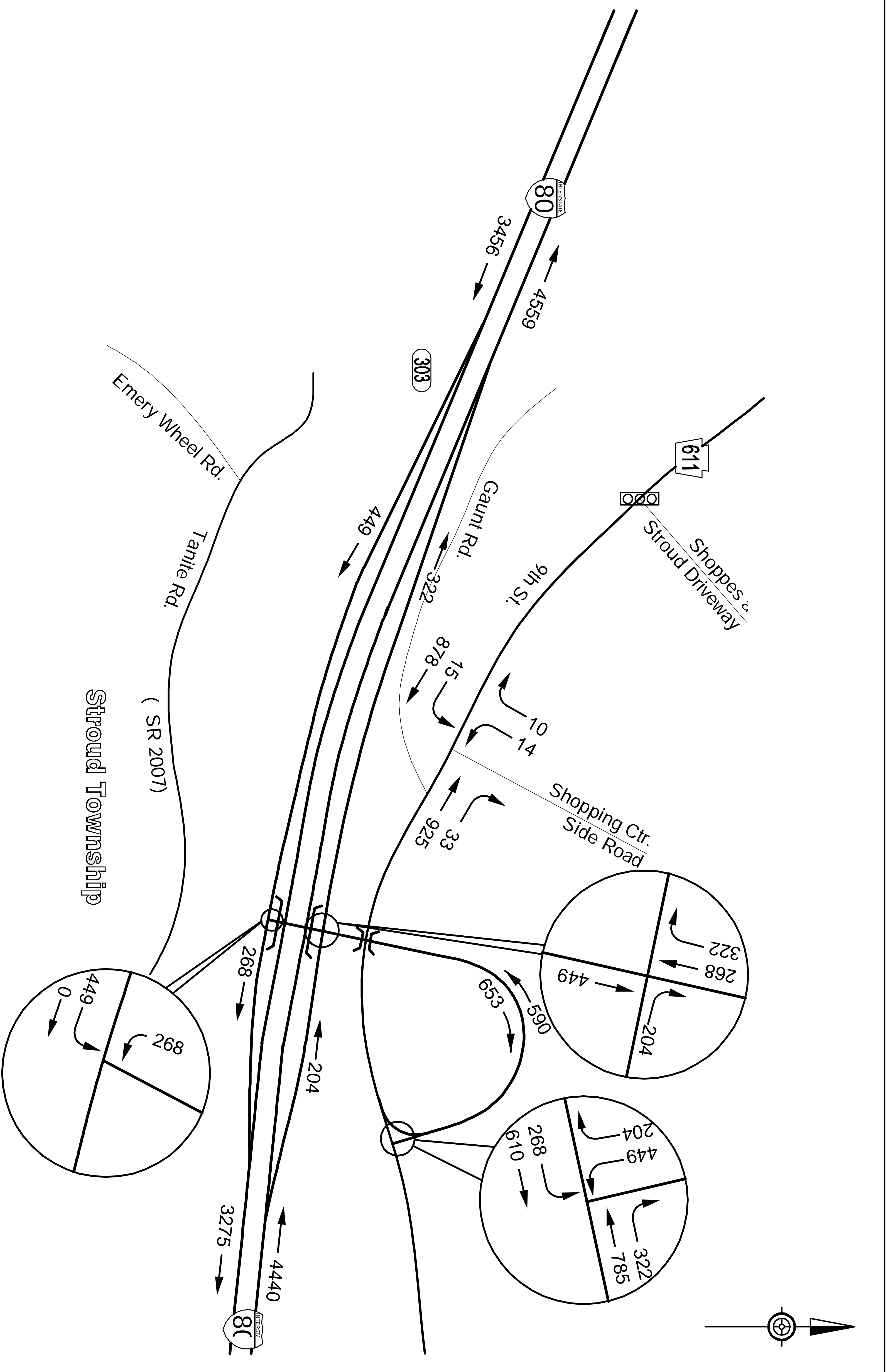
FIGURE 8
 ALTERNATIVE 2A PHASE II
 A.M. PEAK HOUR
 2045 TRAFFIC VOLUMES



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 Monroe County

FIGURE 9
 ALTERNATIVE 2A PHASE II
 P.M. PEAK HOUR
 2045 TRAFFIC VOLUMES

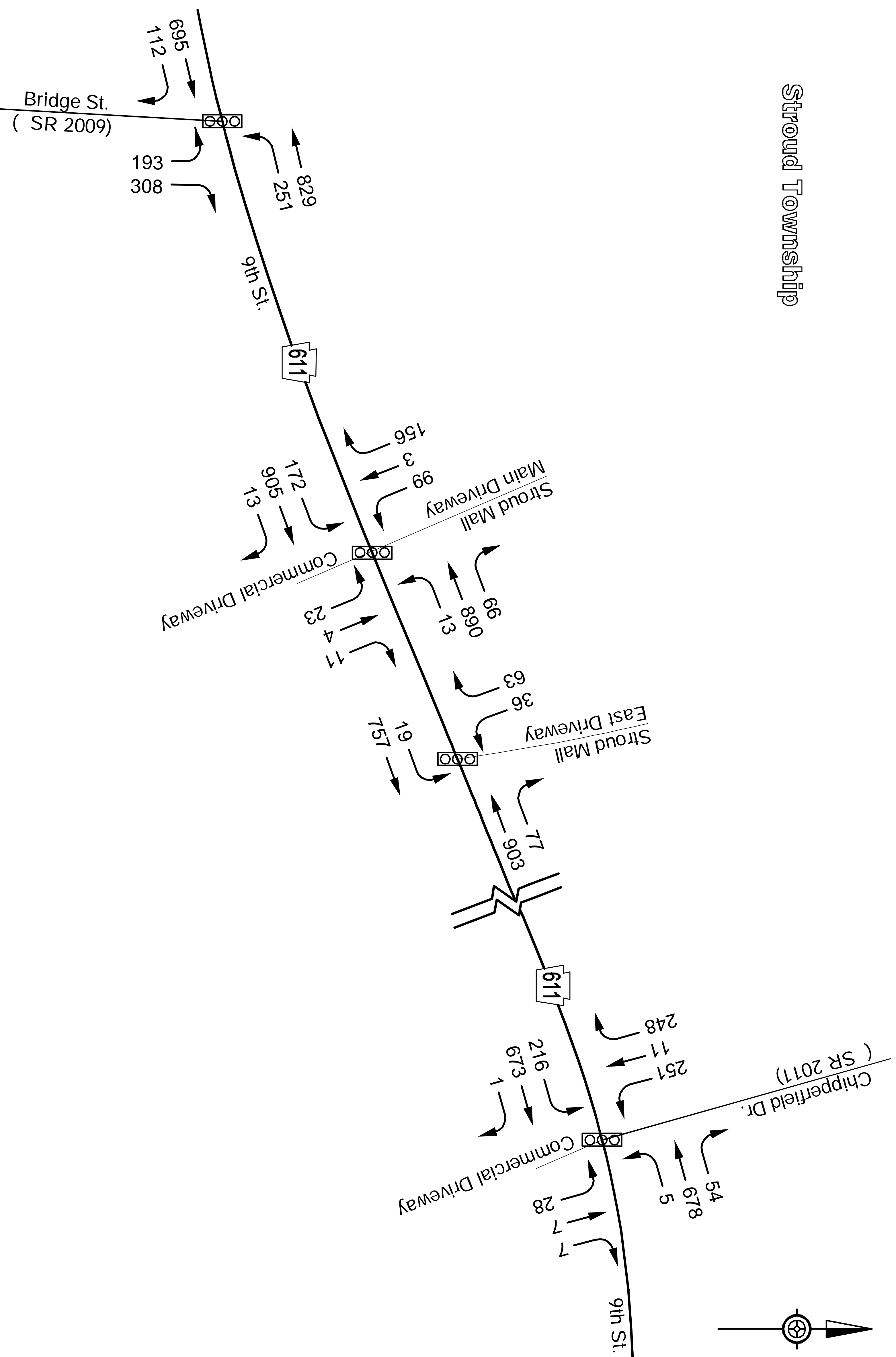
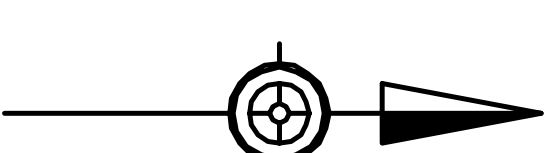


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 Monroe County

FIGURE 10
 ALTERNATIVE 2A PHASE II
 P.M. PEAK HOUR
 2045 TRAFFIC VOLUMES

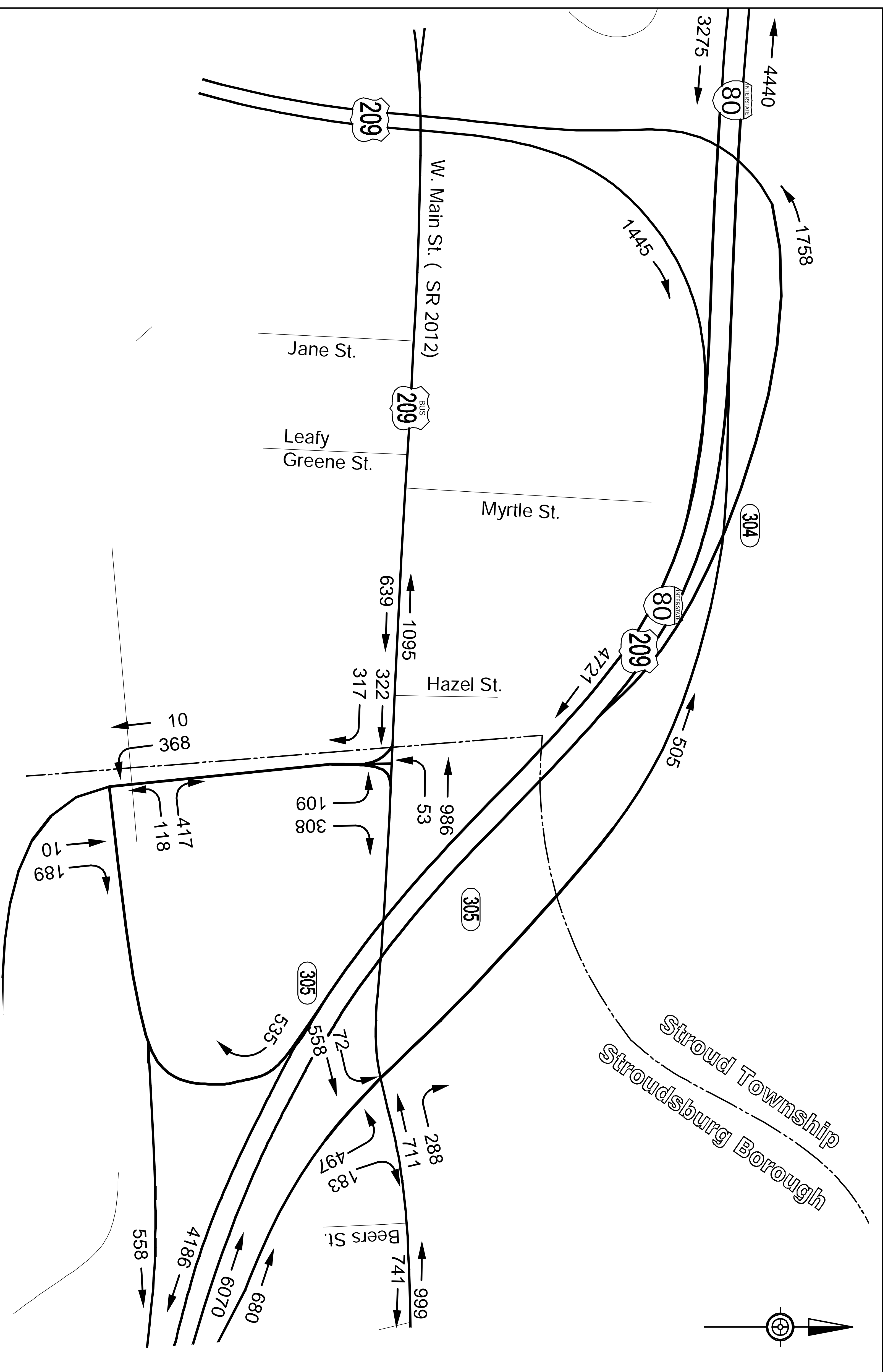
Stroud Township



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Monroe County

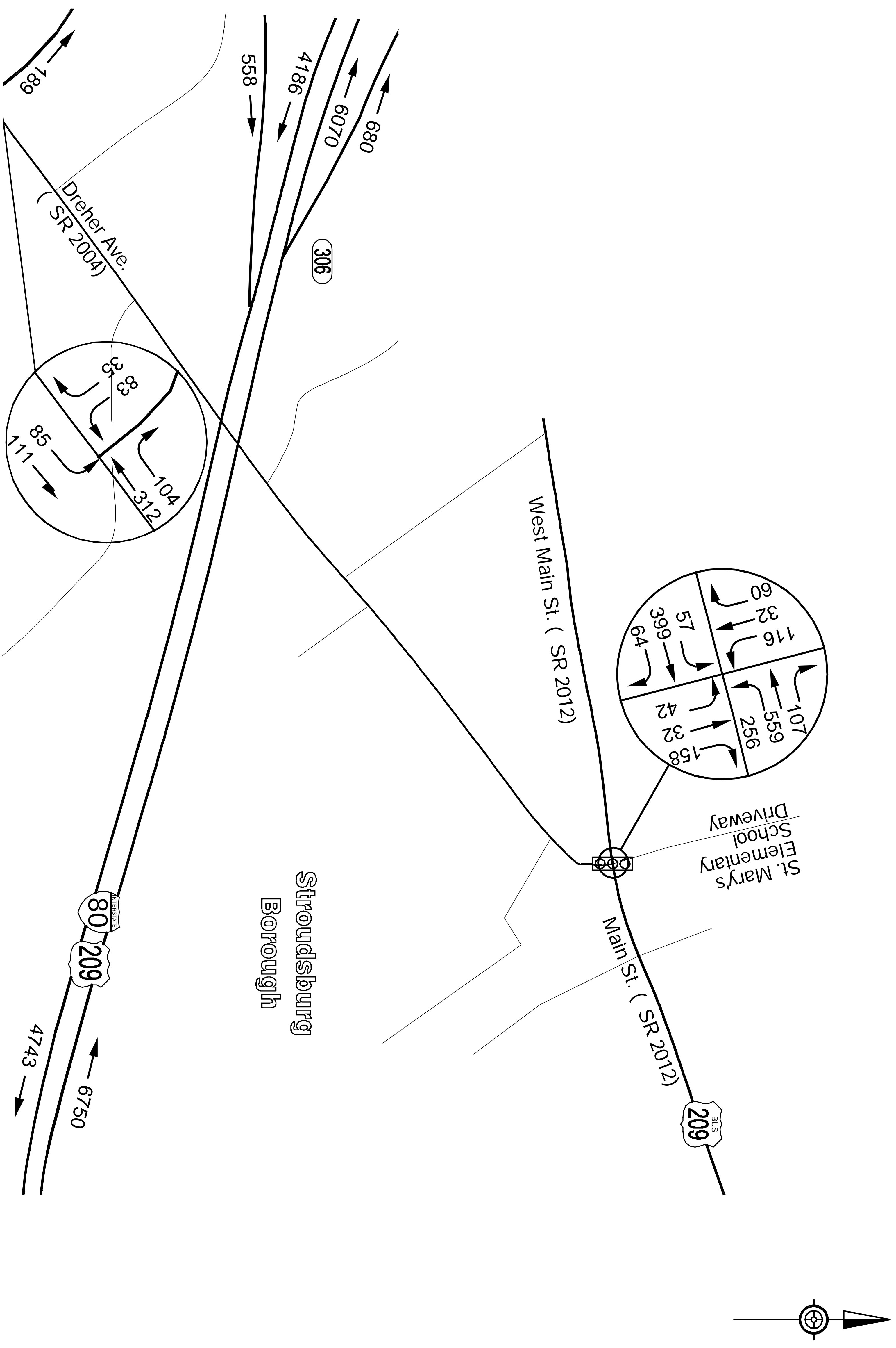
FIGURE 11
ALTERNATIVE 2A PHASE II
P.M. PEAK HOUR
2045 TRAFFIC VOLUMES



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FIGURE 12
ALTERNATIVE 2A PHASE II
P.M. PEAK HOUR
2045 TRAFFIC VOLUMES



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 Monroe County

FIGURE 13
ALTERNATIVE 2A PHASE II
P.M. PEAK HOUR
2045 TRAFFIC VOLUMES

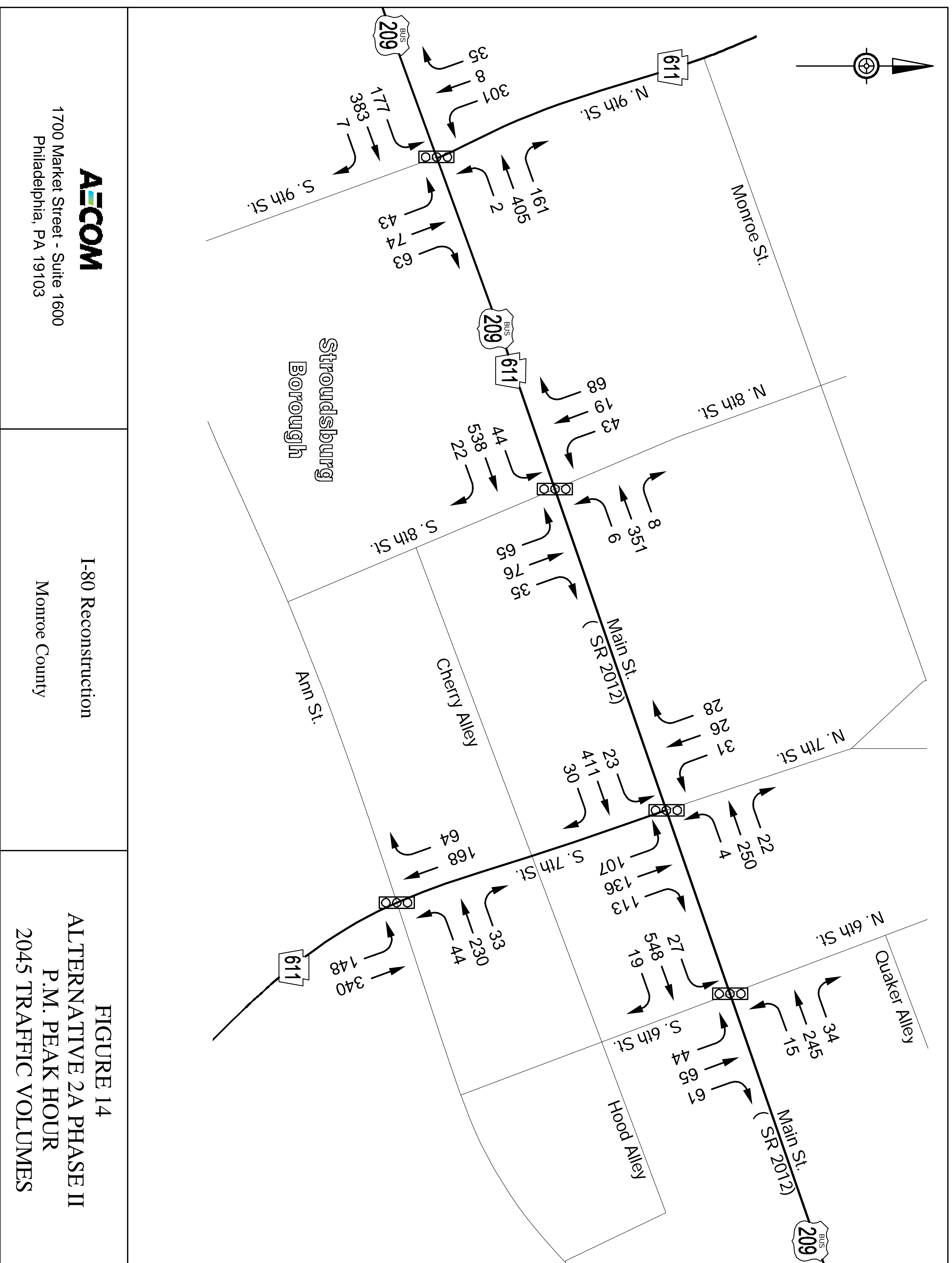


FIGURE 14

ALTERNATIVE 2A PHASE II
P.M. PEAK HOUR
2045 TRAFFIC VOLUMES

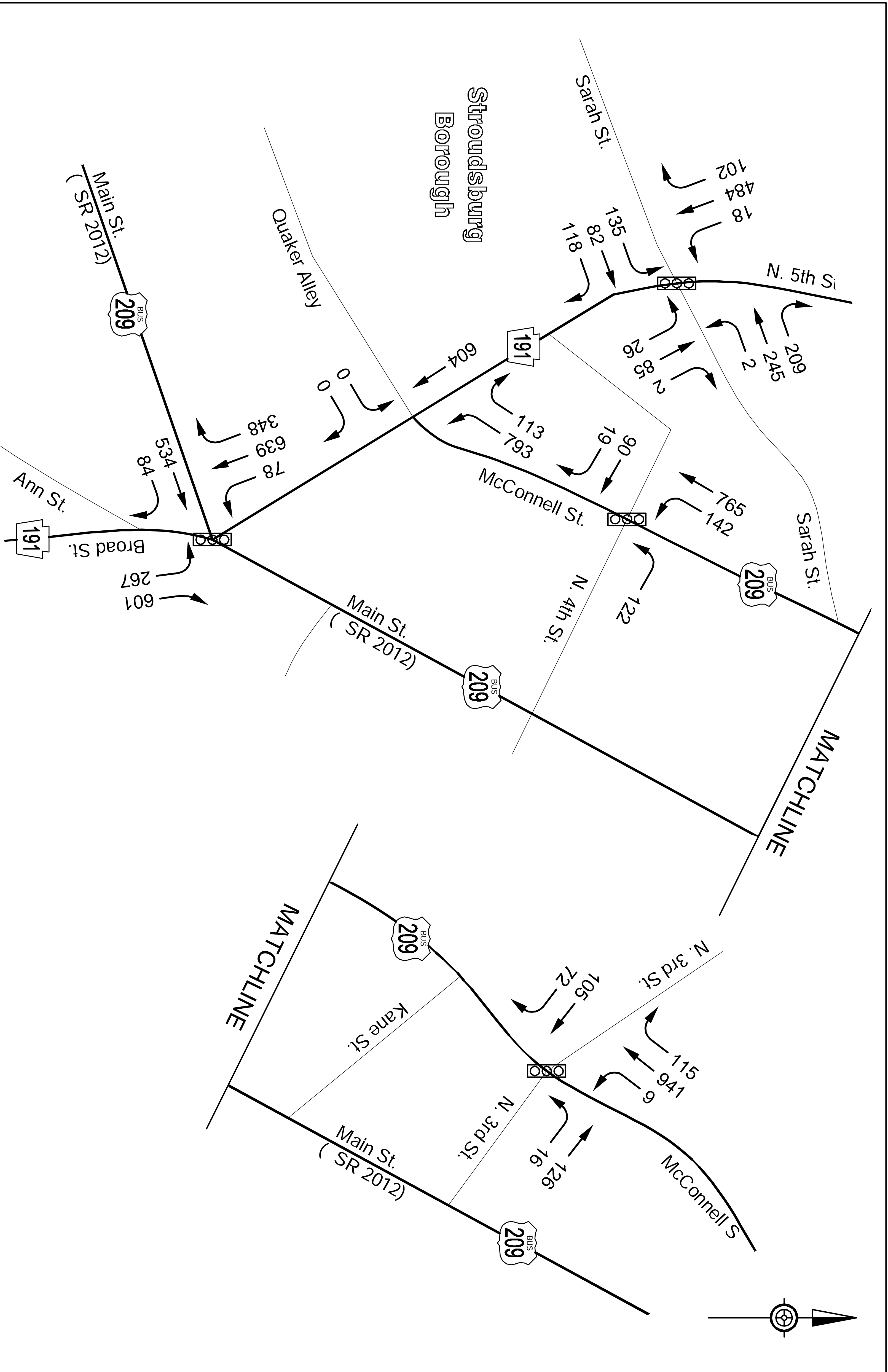


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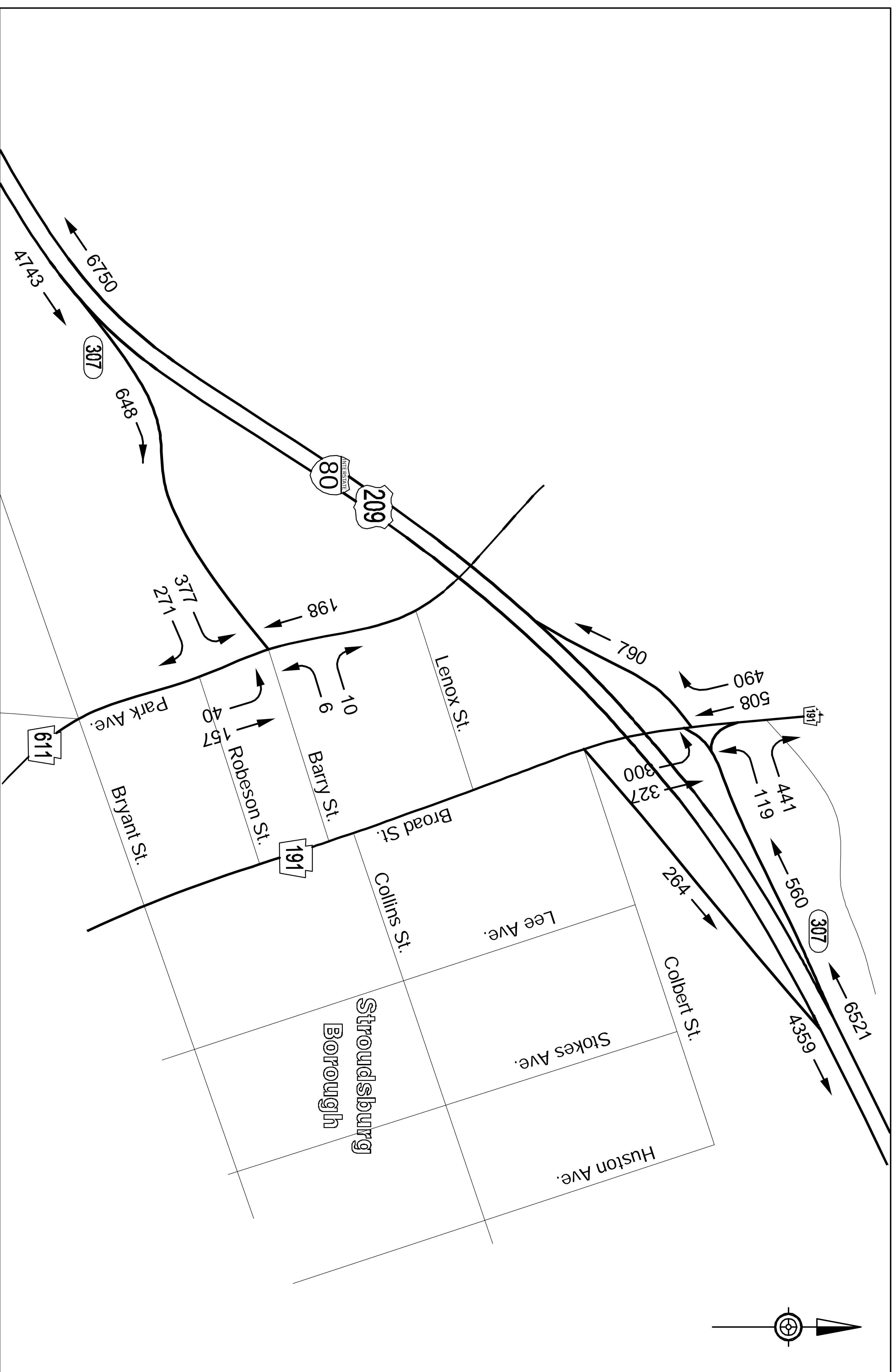
Stroudsburg
Borough



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Philadelphia, PA 19103

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Monroe County

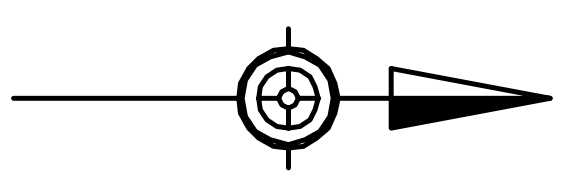
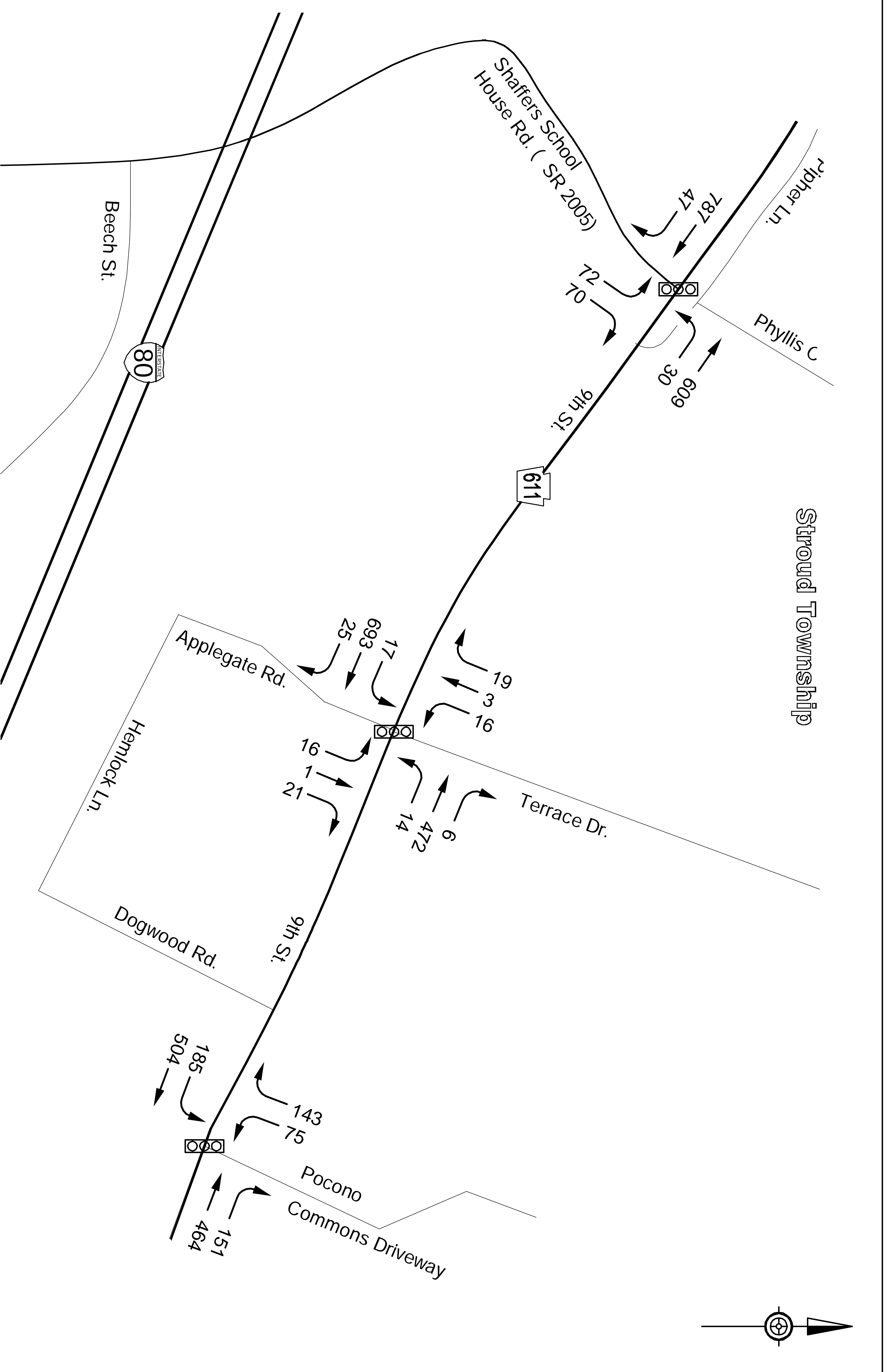
FIGURE 15
ALTERNATIVE 2A PHASE II
P.M. PEAK HOUR
2045 TRAFFIC VOLUMES



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 Monroe County

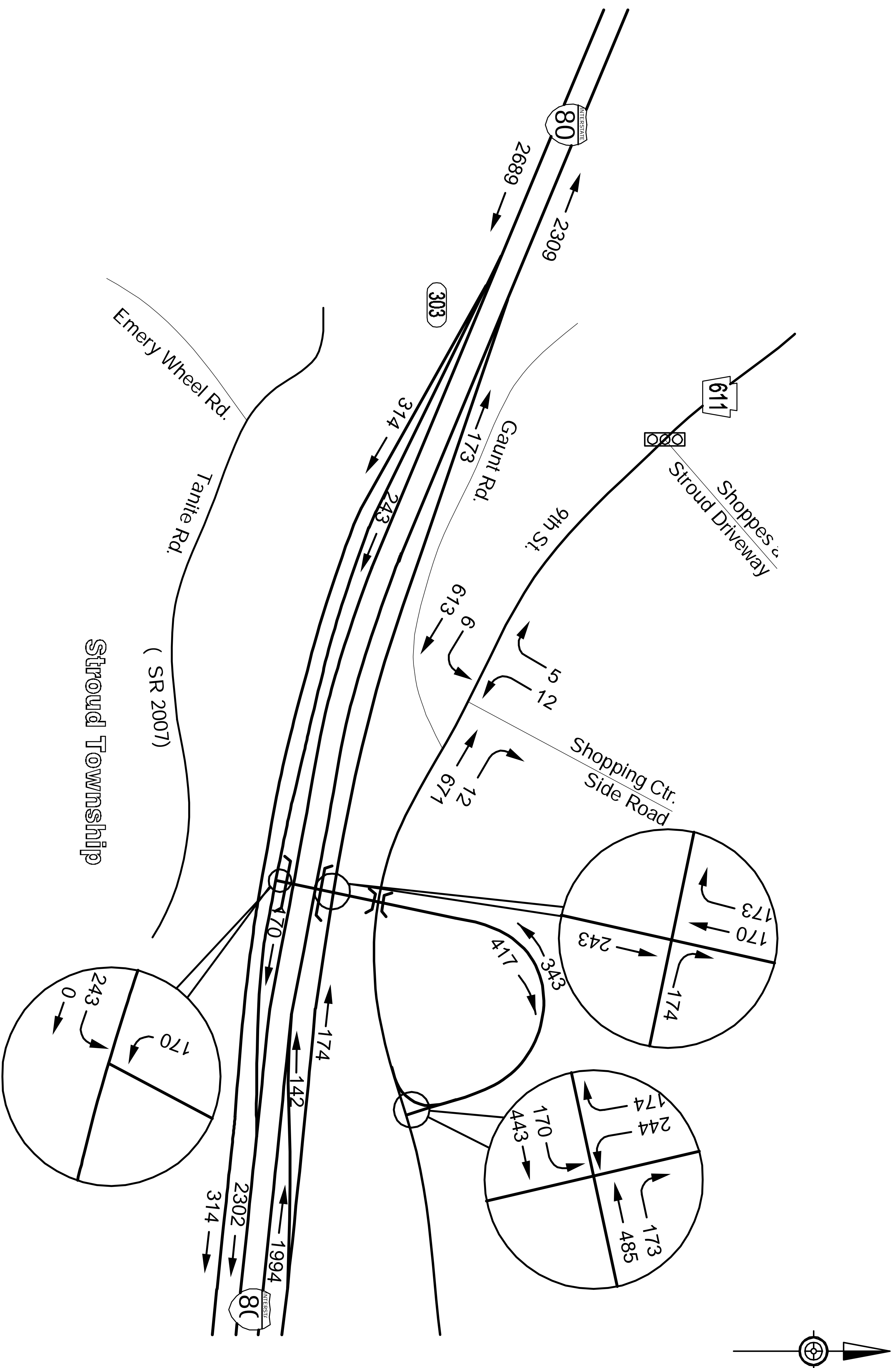
FIGURE 16
ALTERNATIVE 2A PHASE II
P.M. PEAK HOUR
2045 TRAFFIC VOLUMES



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 Monroe County

FIGURE 1
ALTERNATIVE 2B PHASE II
A.M. PEAK HOUR
2045 TRAFFIC VOLUMES

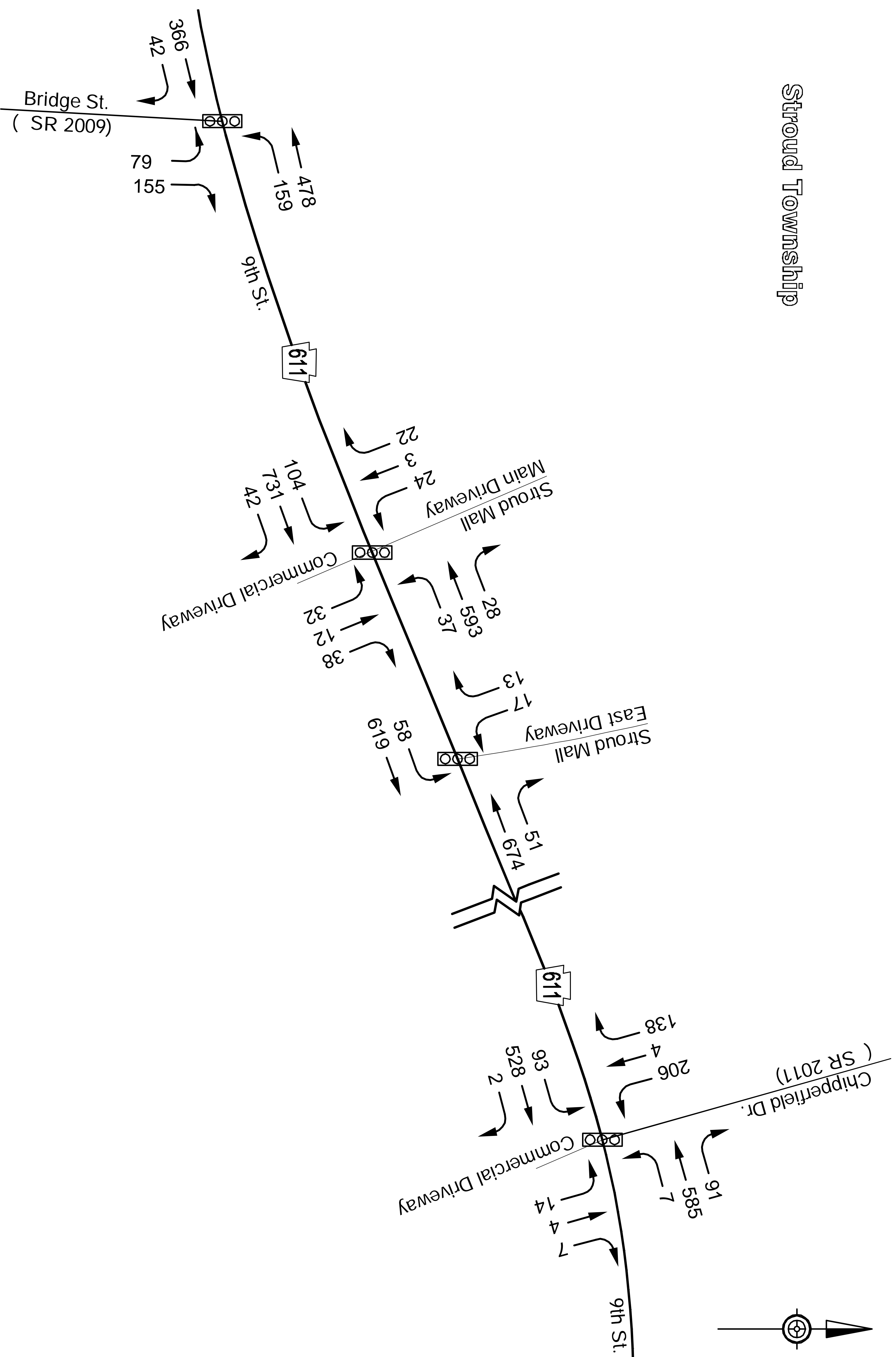
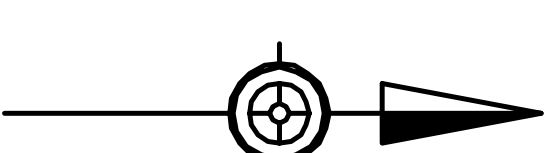


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FIGURE 2
 ALTERNATIVE 2B PHASE II
 A.M. PEAK HOUR
 2045 TRAFFIC VOLUMES

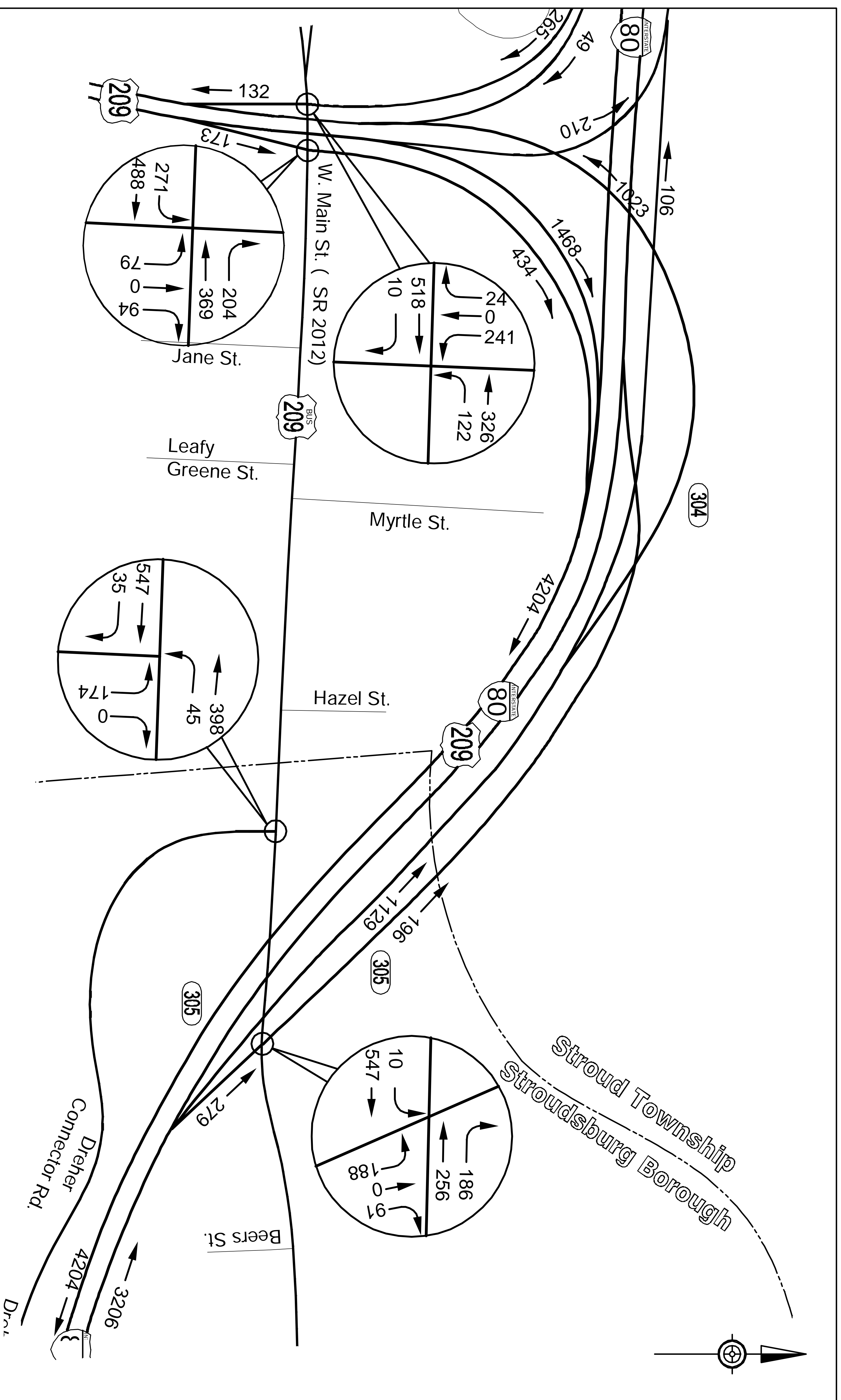
Stroud Township



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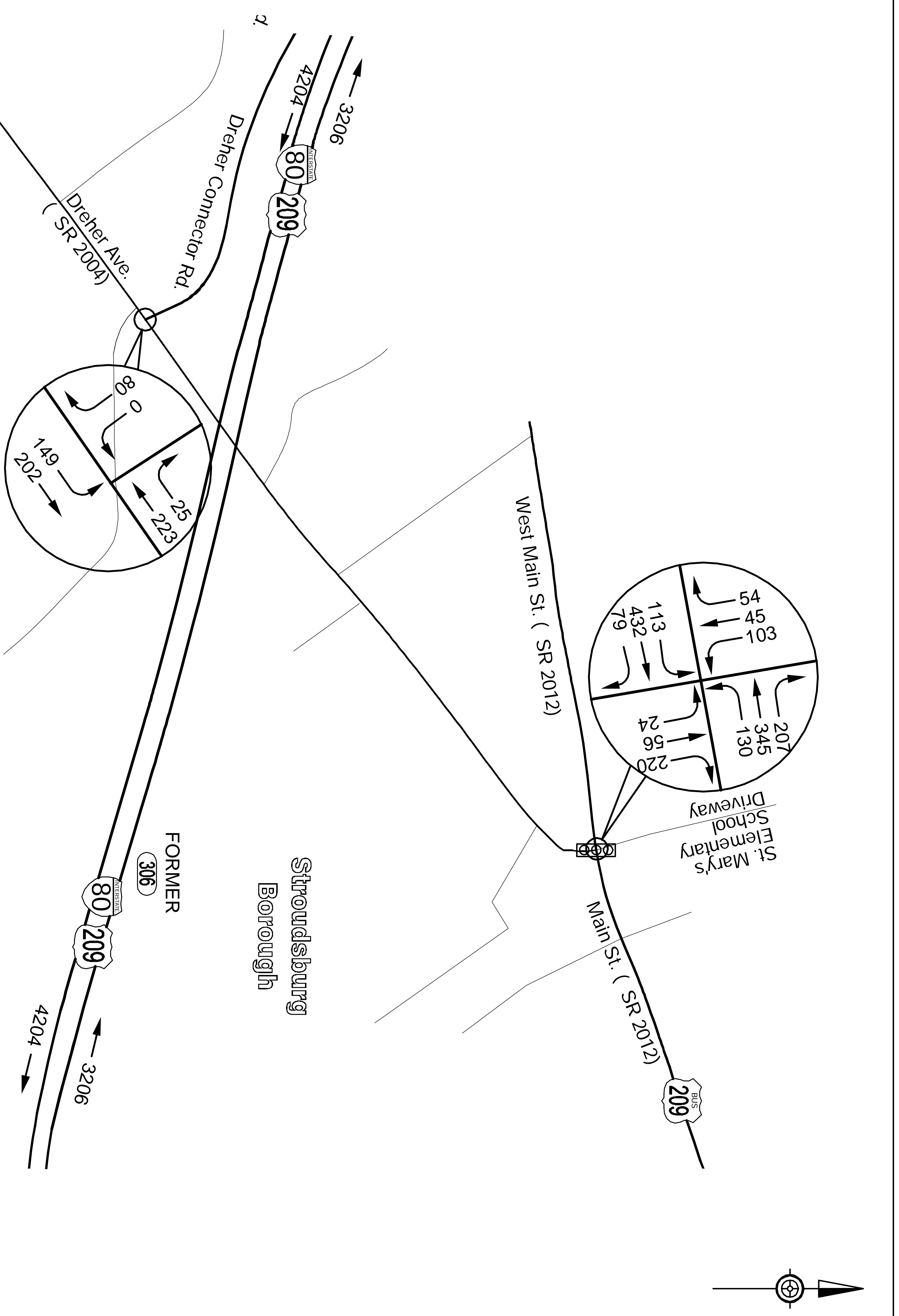
FIGURE 3
ALTERNATIVE 2B PHASE II
A.M. PEAK HOUR
2045 TRAFFIC VOLUMES



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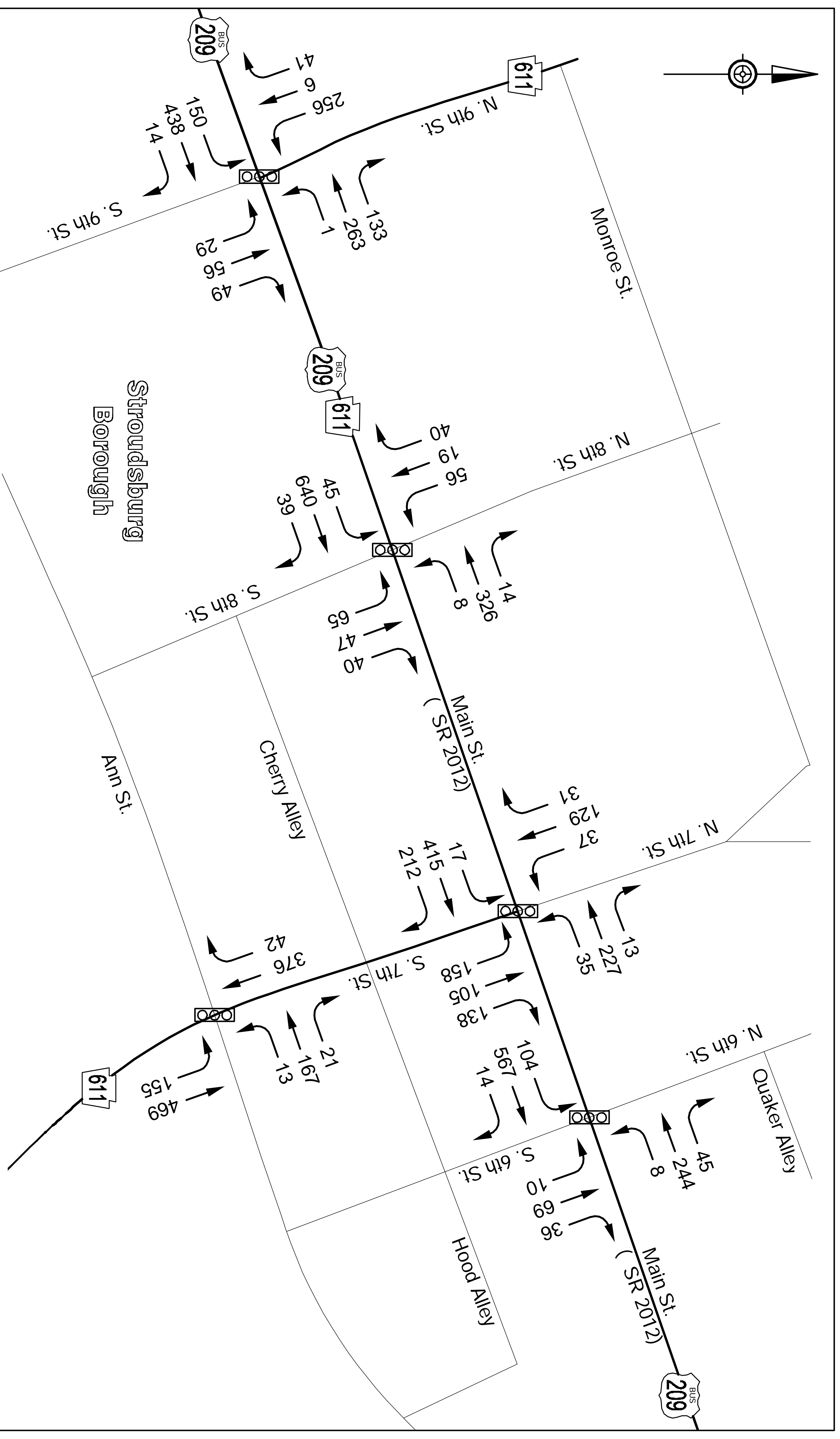
FIGURE 4
ALTERNATIVE 2B PHASE II
A.M. PEAK HOUR
2045 TRAFFIC VOLUMES



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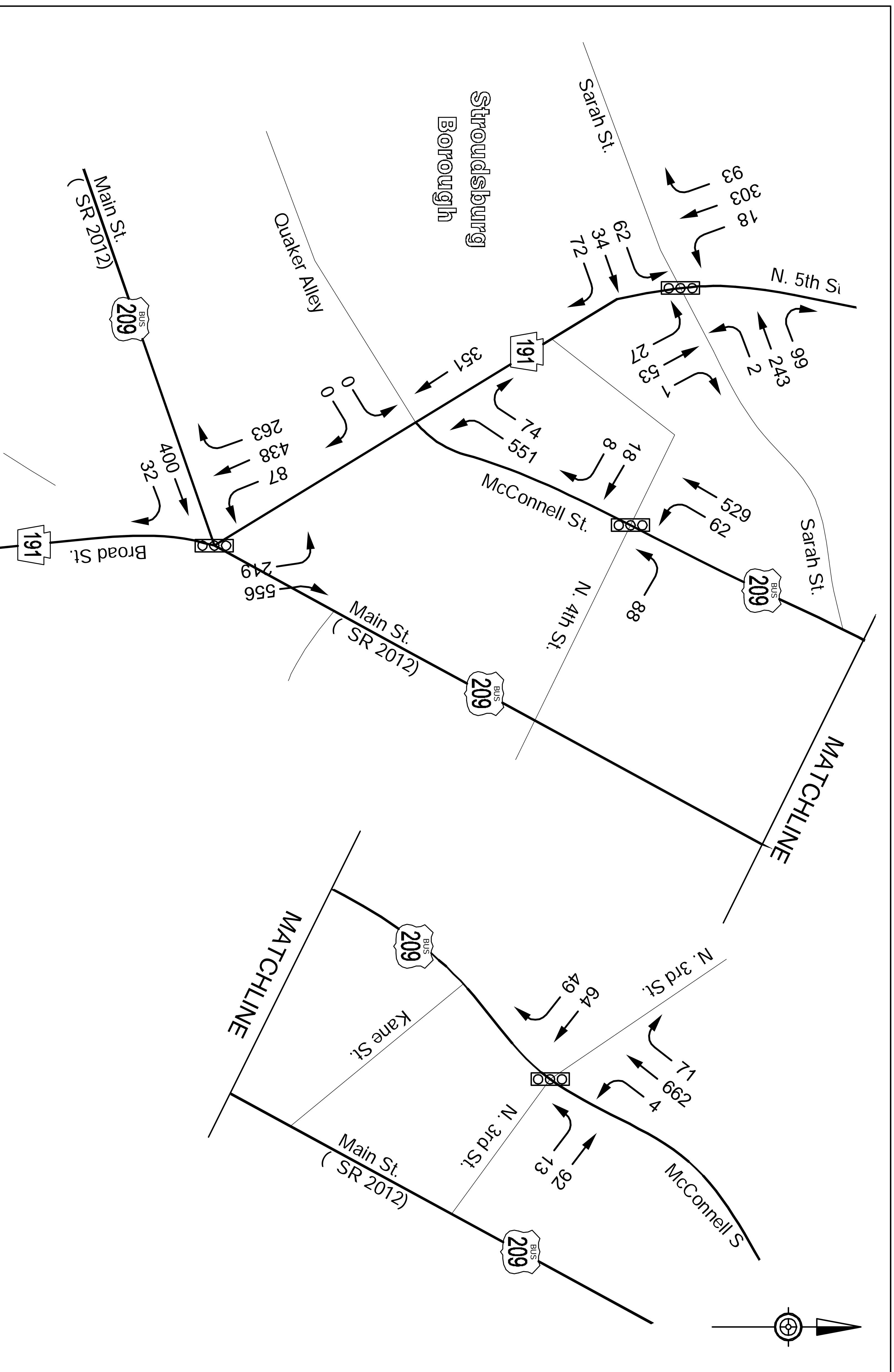
FIGURE 5
 ALTERNATIVE 2B PHASE II
 A.M. PEAK HOUR
 2045 TRAFFIC VOLUMES



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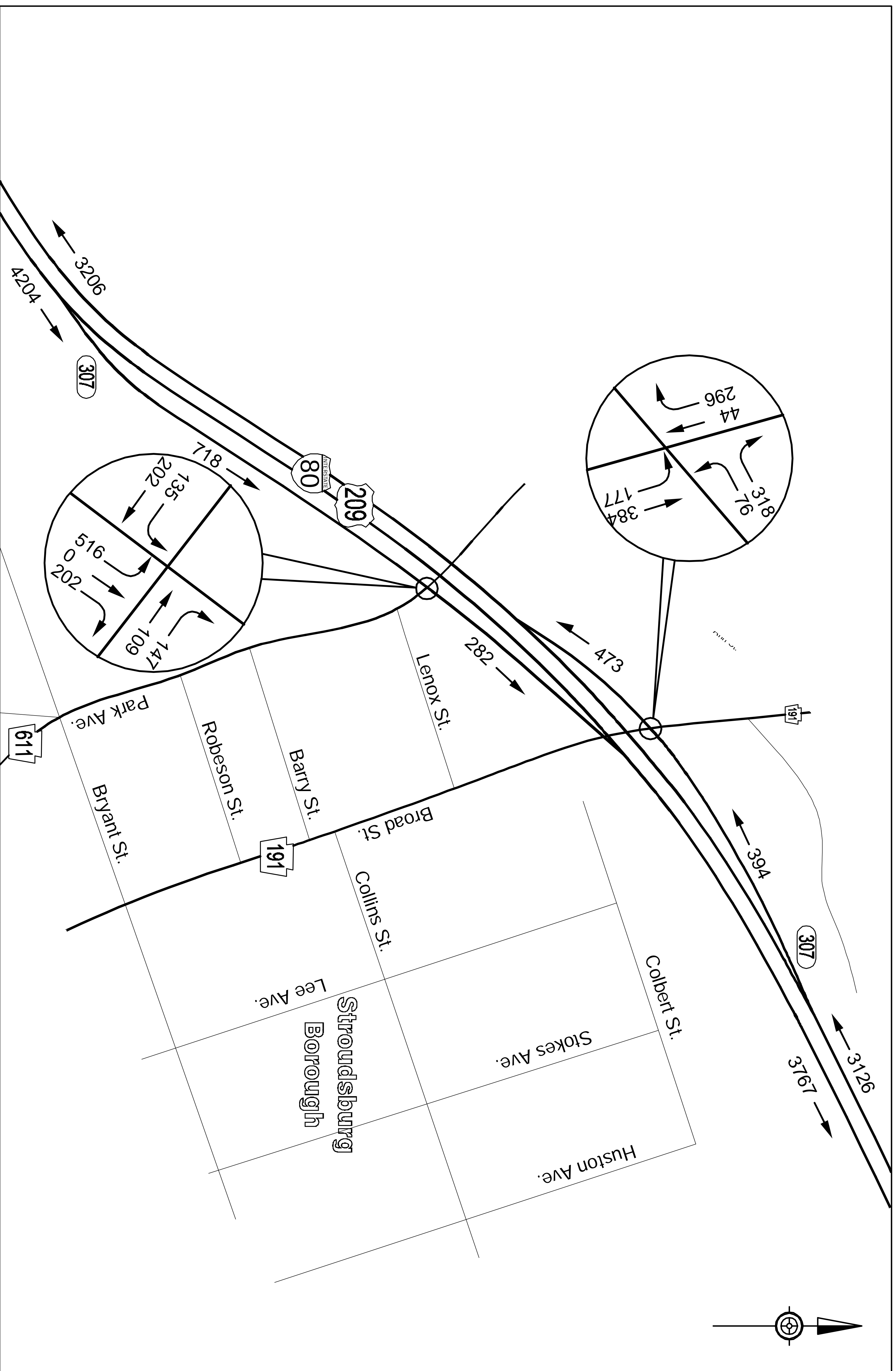
FIGURE 6
 ALTERNATIVE 2B PHASE II
 A.M. PEAK HOUR
 2045 TRAFFIC VOLUMES



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 Monroe County

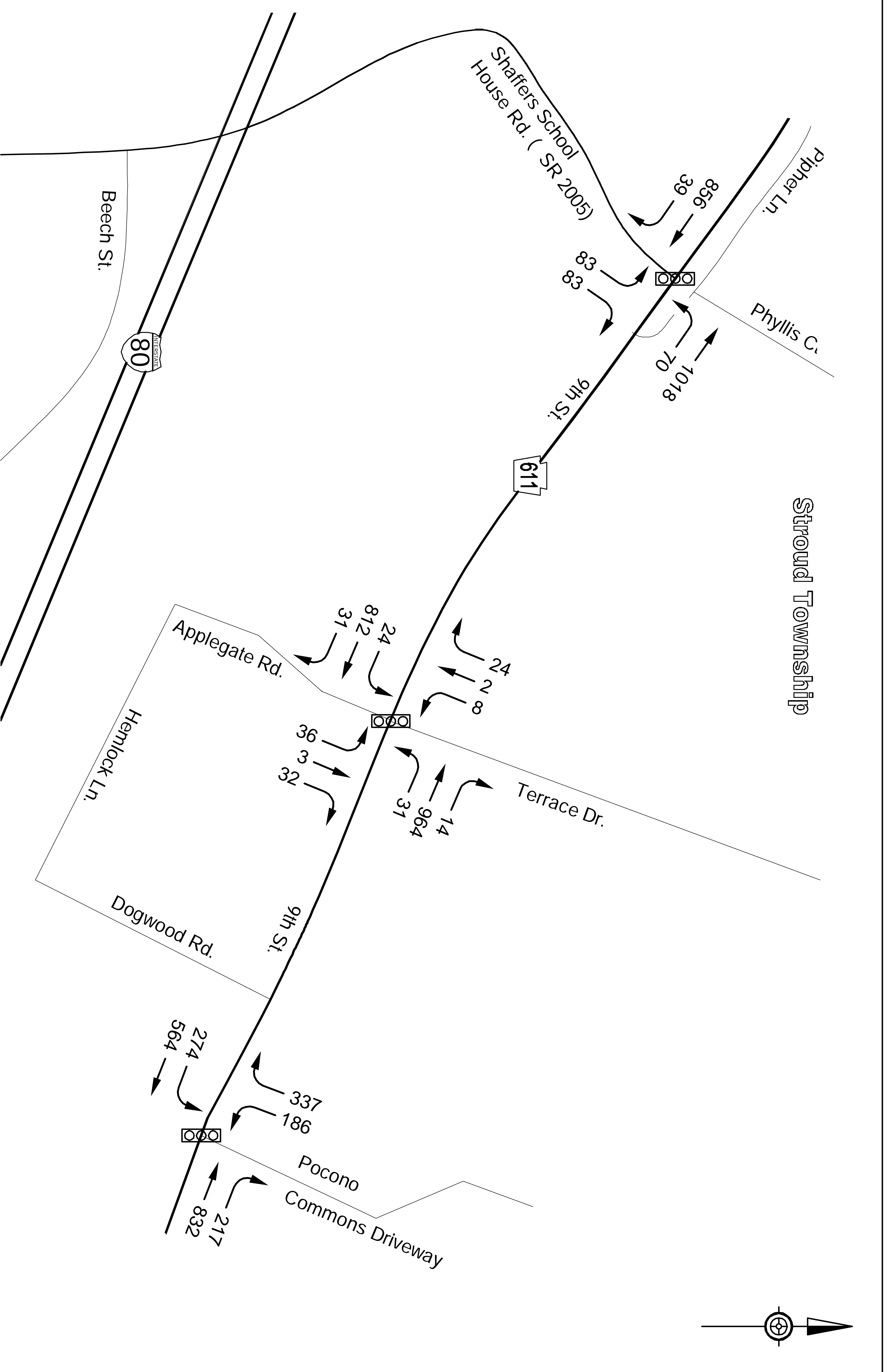
FIGURE 7
ALTERNATIVE 2B PHASE II
A.M. PEAK HOUR
2045 TRAFFIC VOLUMES



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 Monroe County

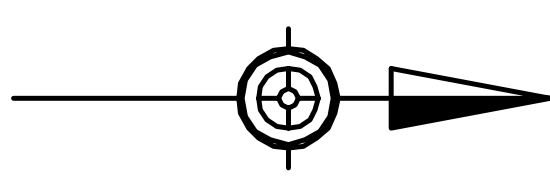
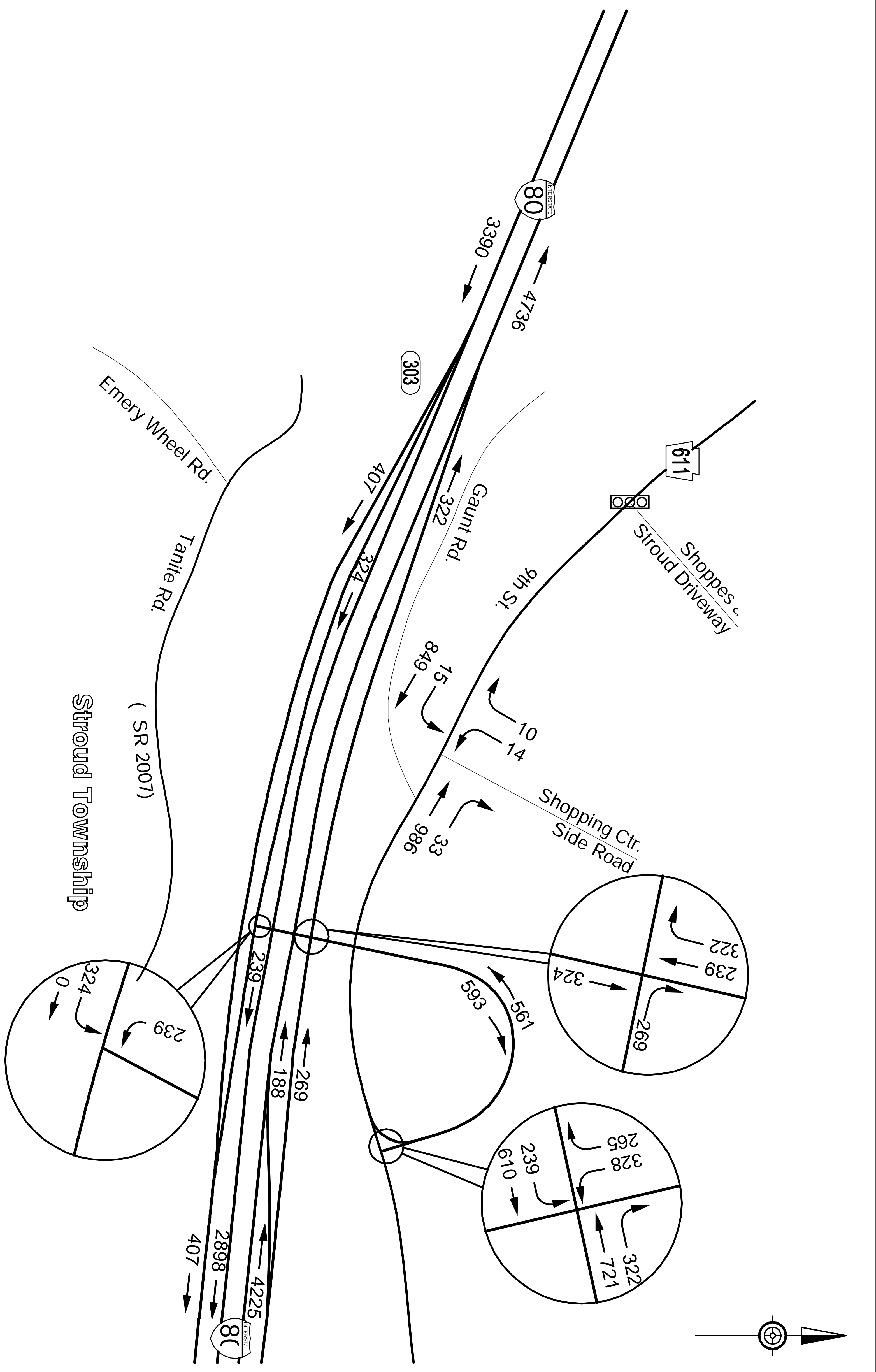
FIGURE 8
 ALTERNATIVE 2B PHASE II
 A.M. PEAK HOUR
 2045 TRAFFIC VOLUMES



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FIGURE 9
ALTERNATIVE 2B PHASE II
P.M. PEAK HOUR
2045 TRAFFIC VOLUMES

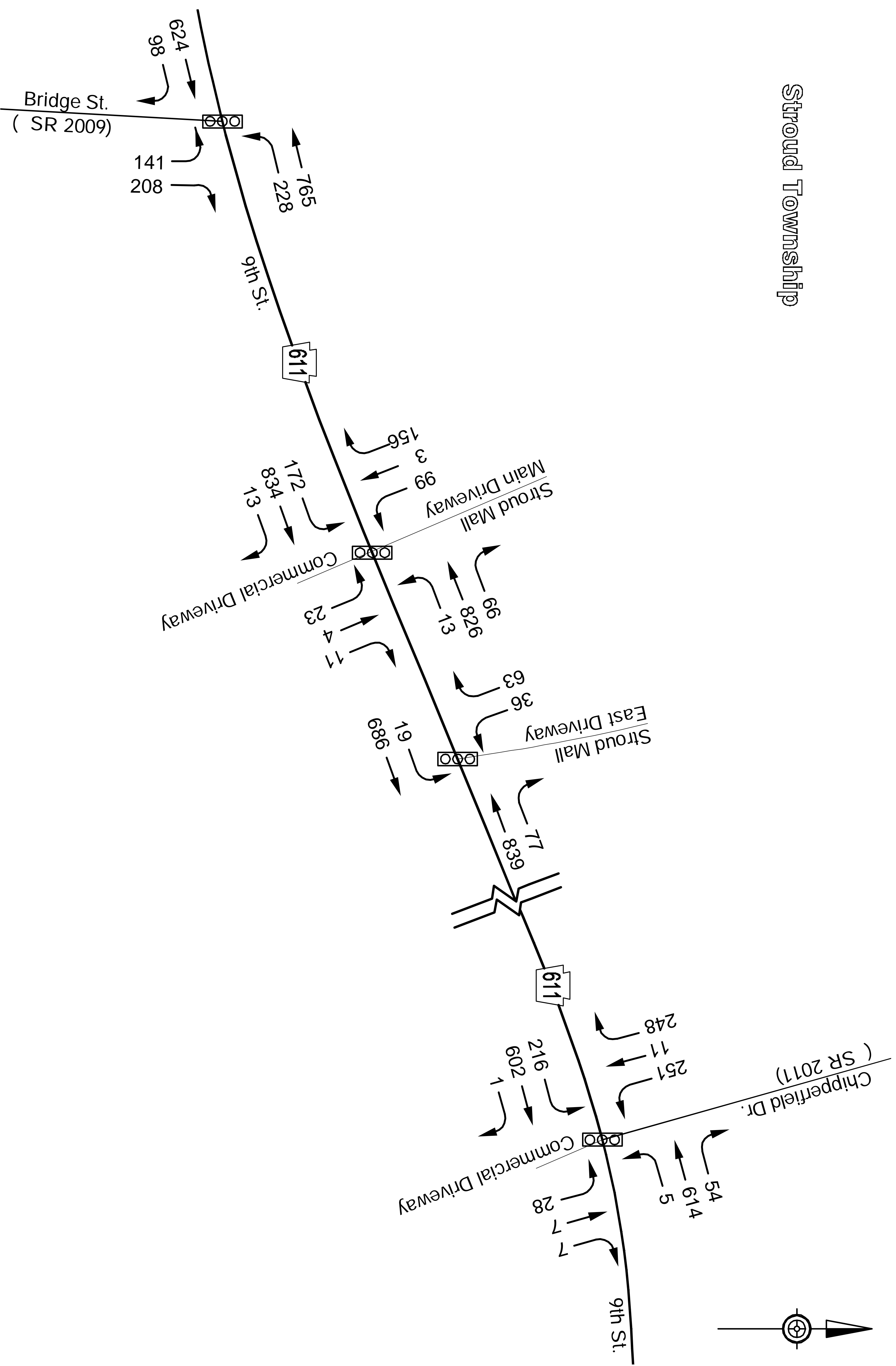


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FIGURE 10
ALTERNATIVE 2B PHASE II
P.M. PEAK HOUR
2045 TRAFFIC VOLUMES

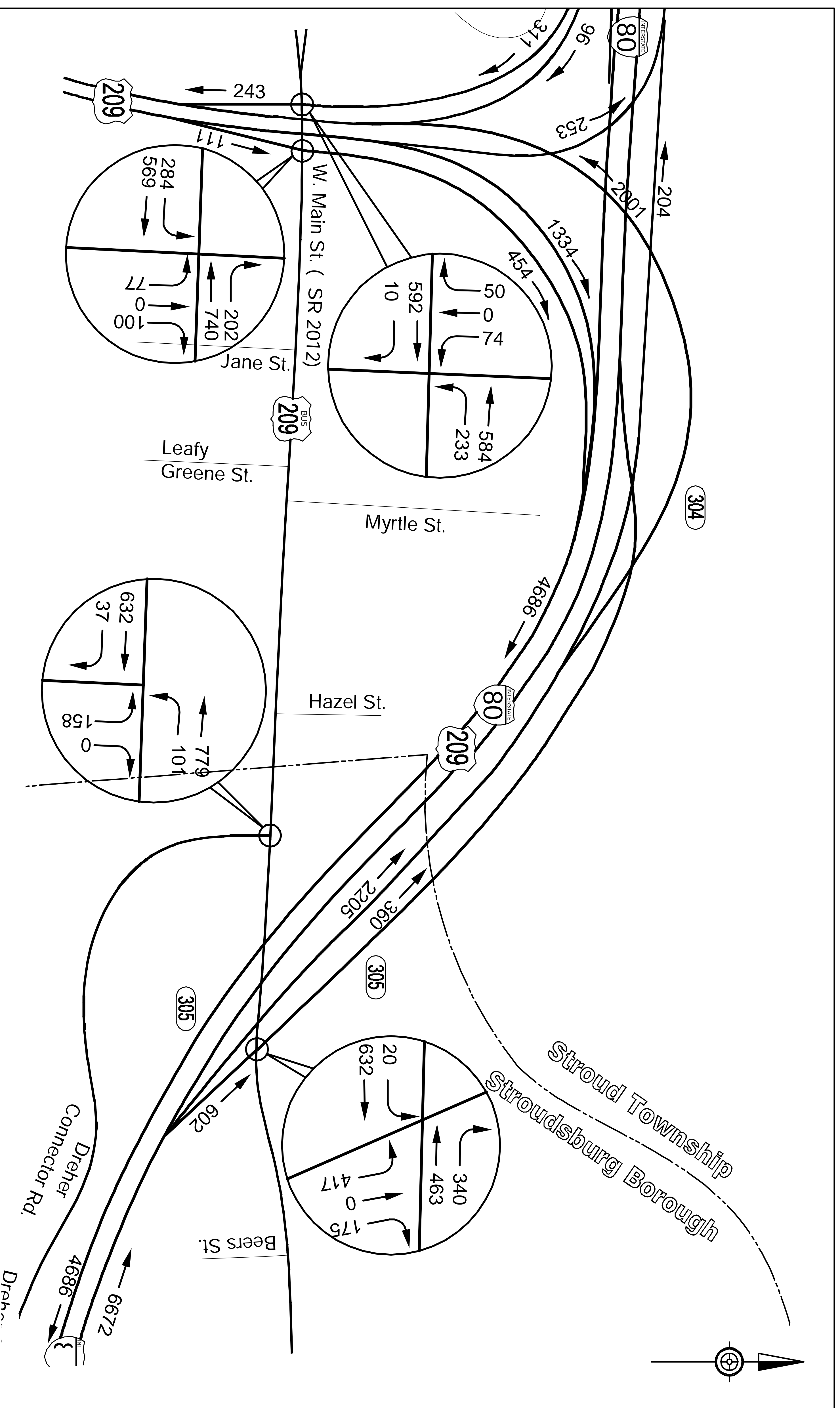
Stroud Township



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 Monroe County

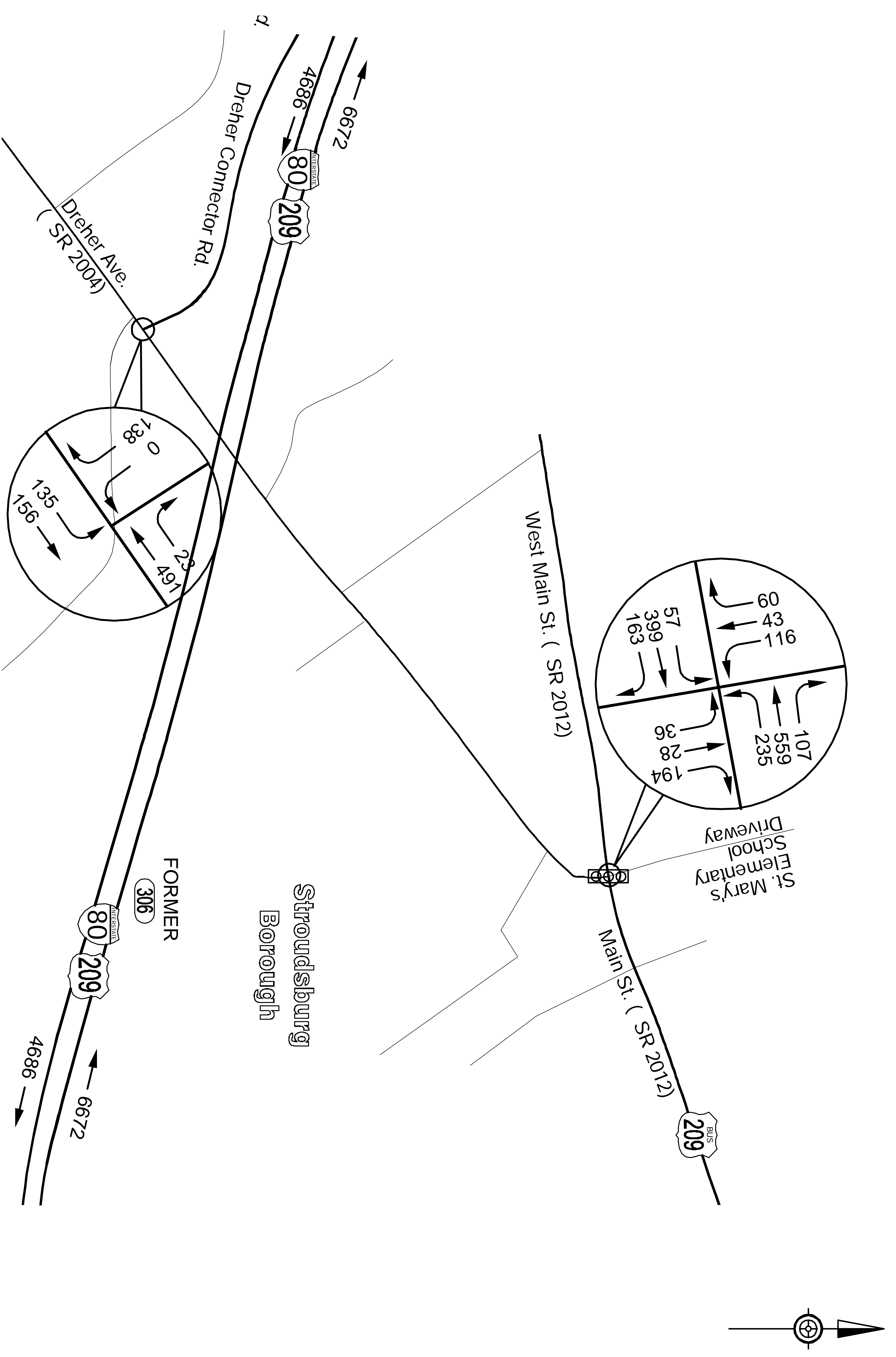
FIGURE 11
 ALTERNATIVE 2B PHASE II
 P.M. PEAK HOUR
 2045 TRAFFIC VOLUMES



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 Monroe County

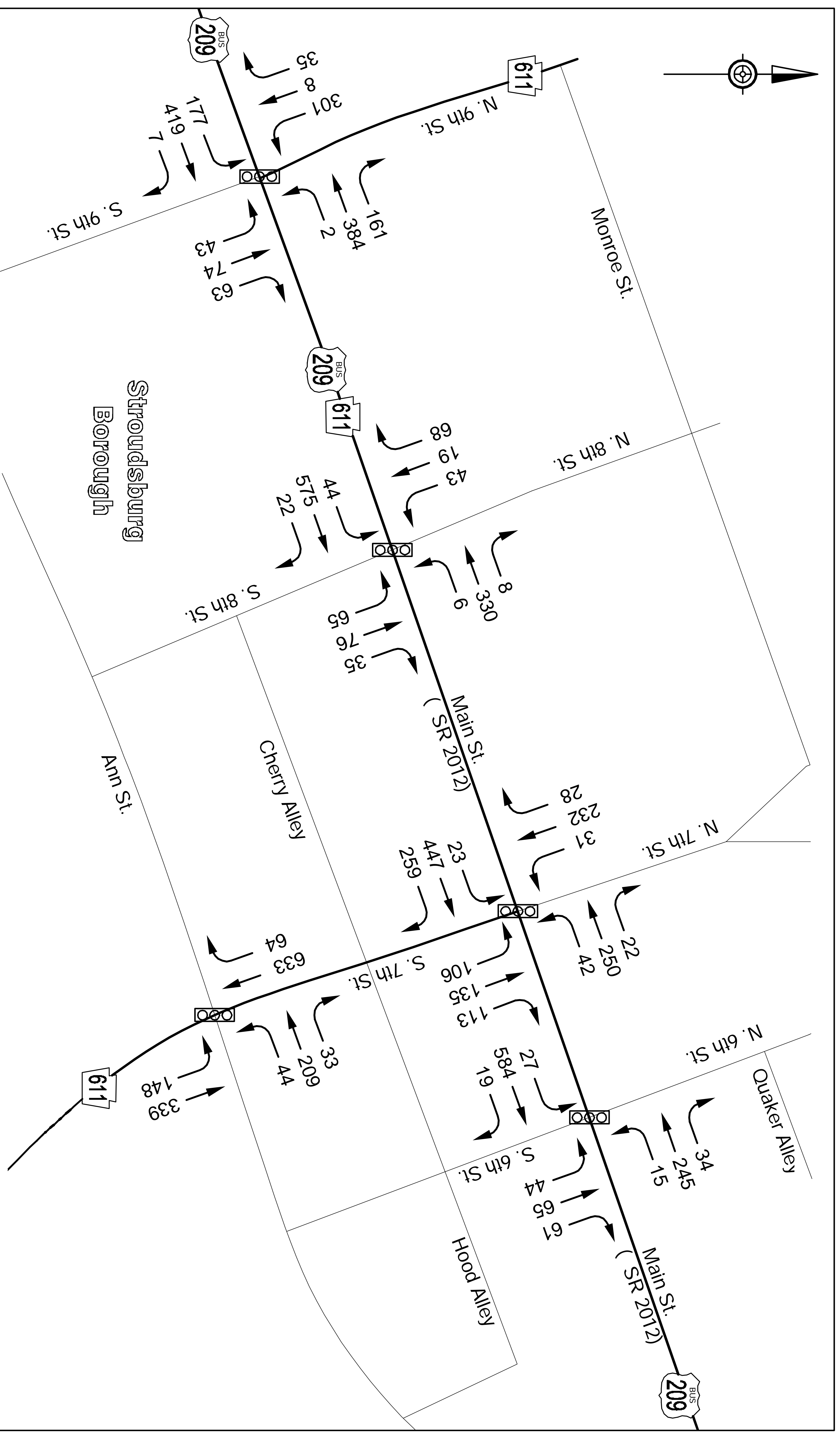
FIGURE 12
 ALTERNATIVE 2B PHASE II
 P.M. PEAK HOUR
 2045 TRAFFIC VOLUMES



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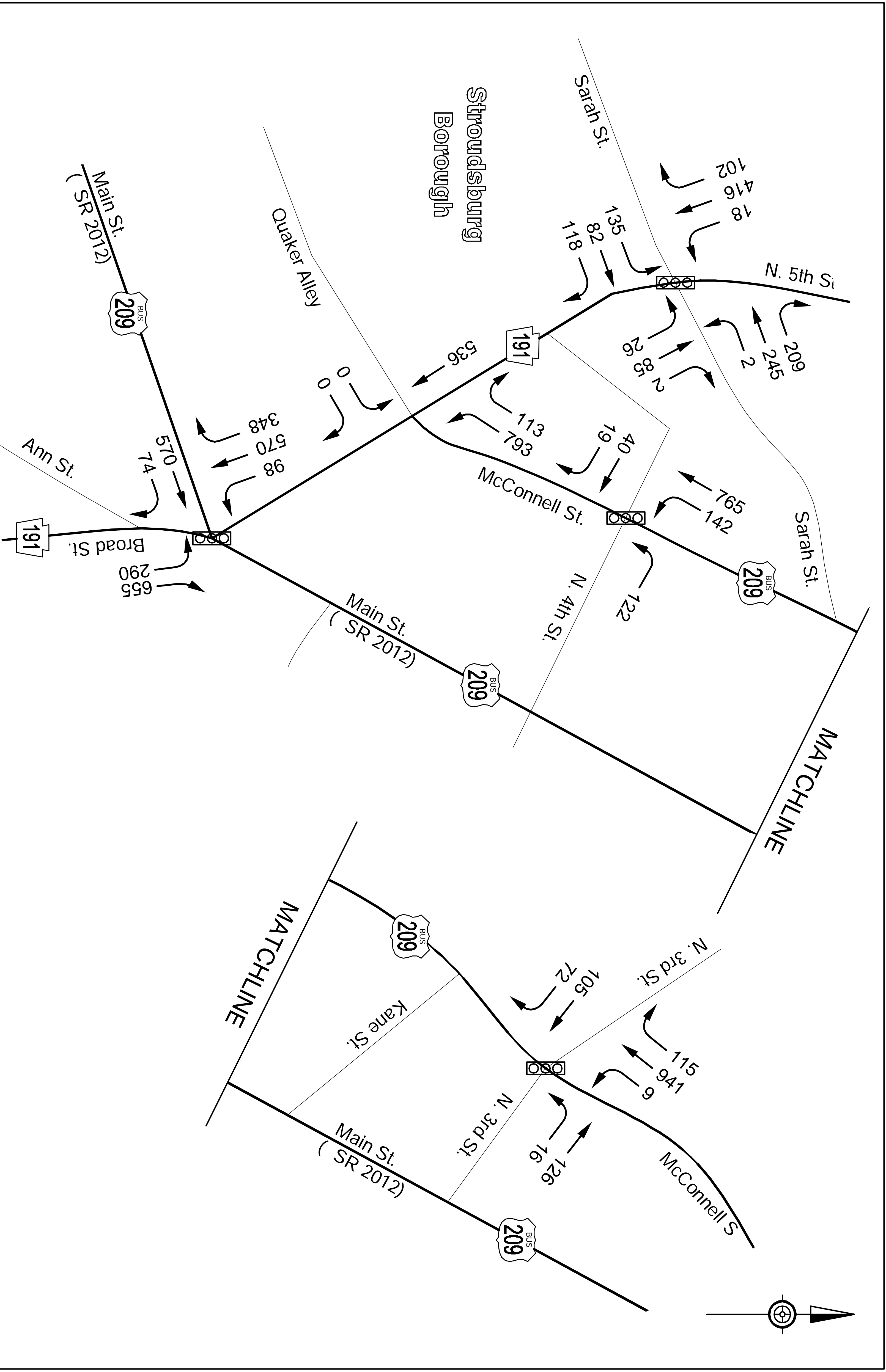
FIGURE 13
 ALTERNATIVE 2B PHASE II
 P.M. PEAK HOUR
 2045 TRAFFIC VOLUMES



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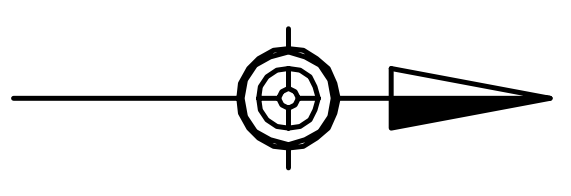
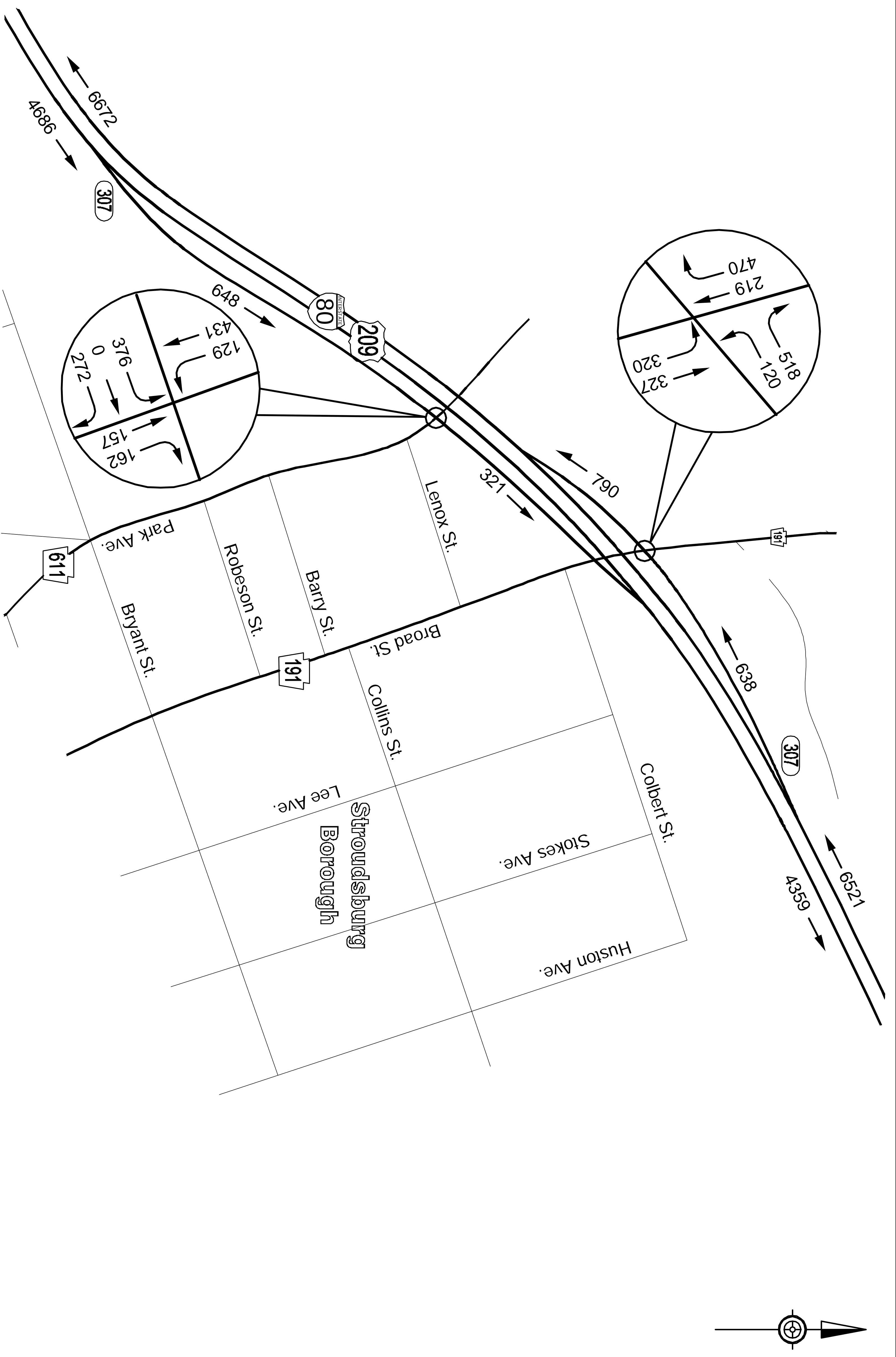
FIGURE 14
 ALTERNATIVE 2B PHASE II
 P.M. PEAK HOUR
 2045 TRAFFIC VOLUMES



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FIGURE 15
 ALTERNATIVE 2B PHASE II
 P.M. PEAK HOUR
 2045 TRAFFIC VOLUMES

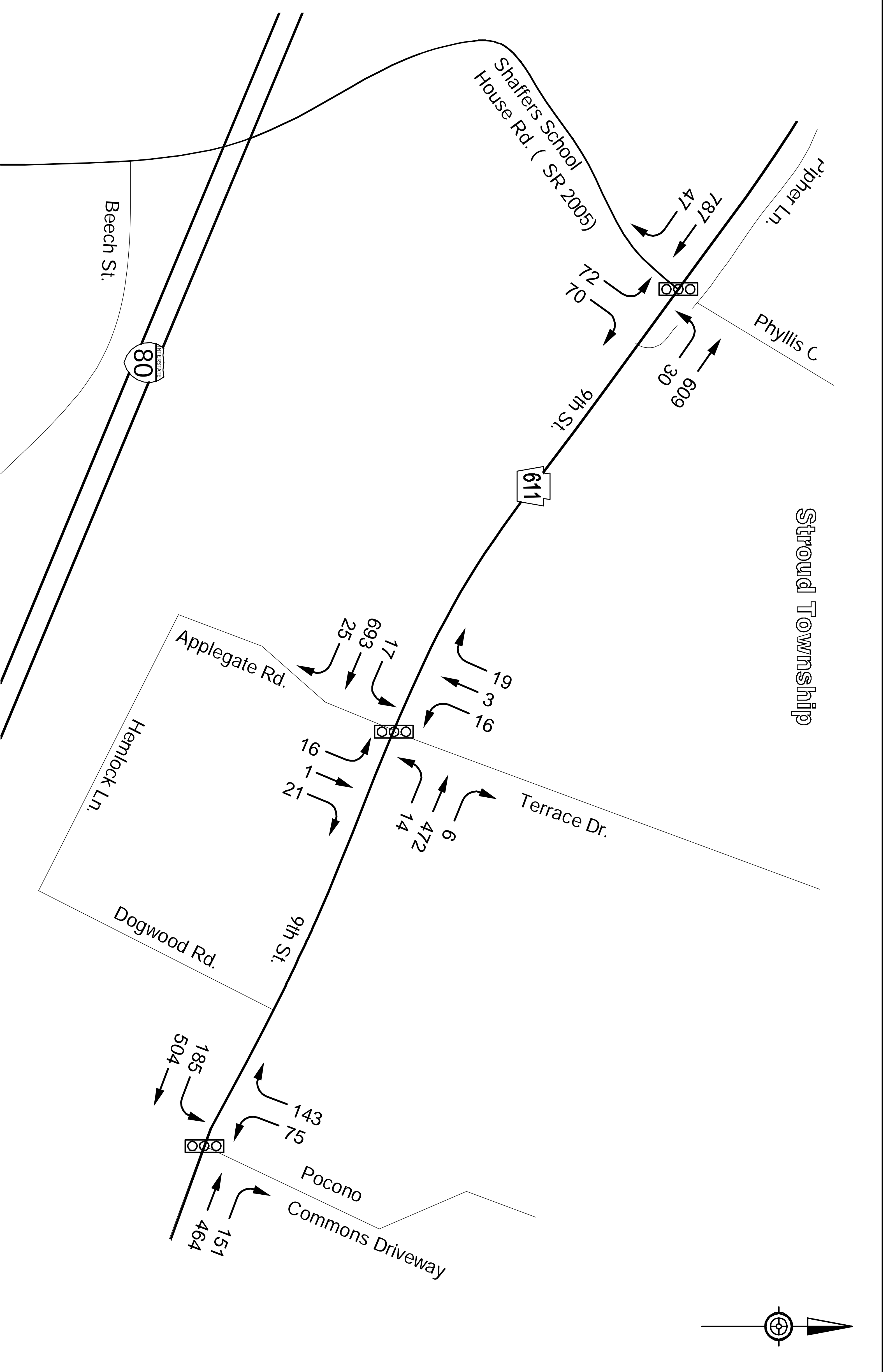


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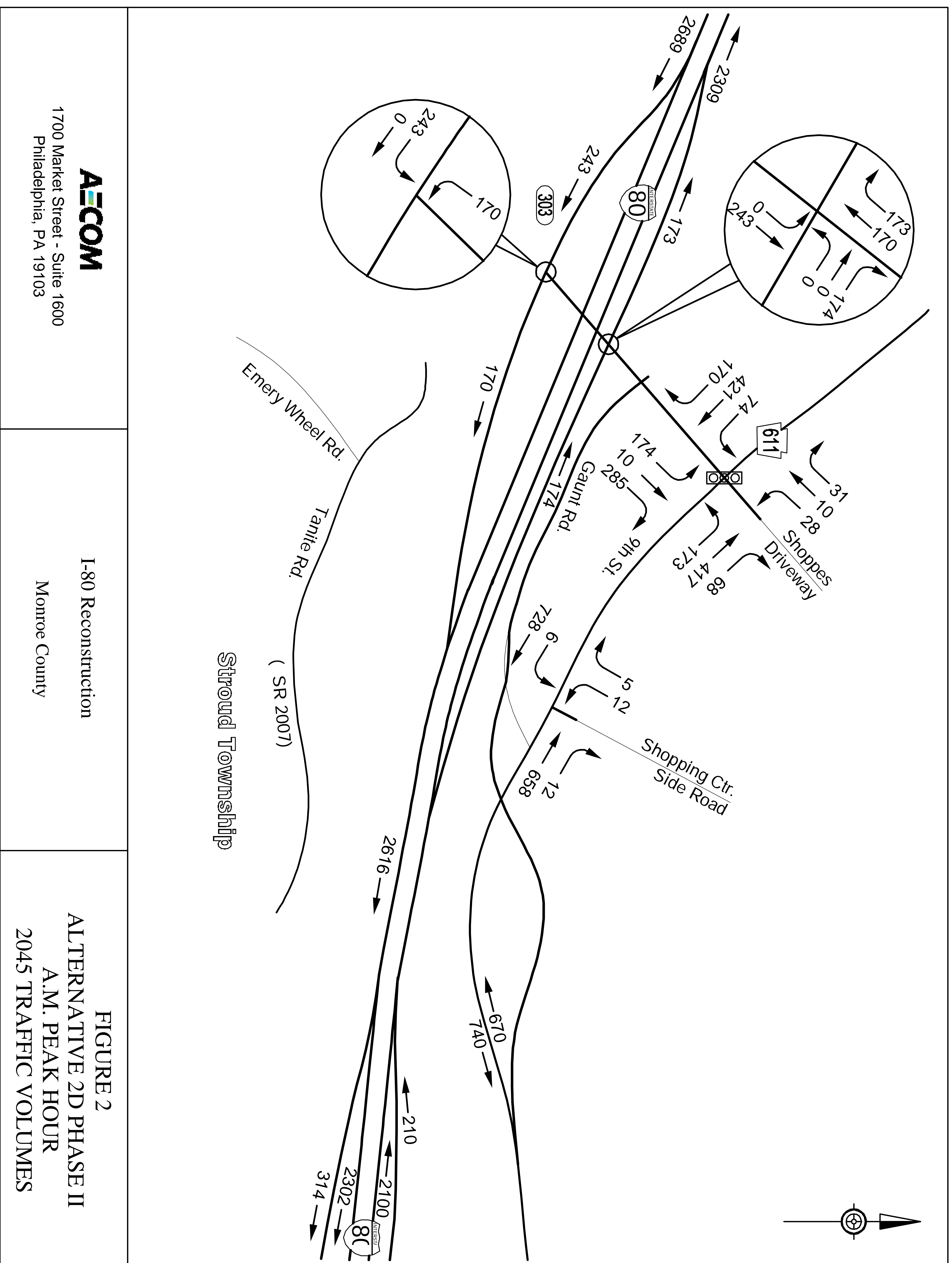
FIGURE 16
ALTERNATIVE 2B PHASE II
P.M. PEAK HOUR
2045 TRAFFIC VOLUMES



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FIGURE 1
ALTERNATIVE 2D PHASE II
A.M. PEAK HOUR
2045 TRAFFIC VOLUMES



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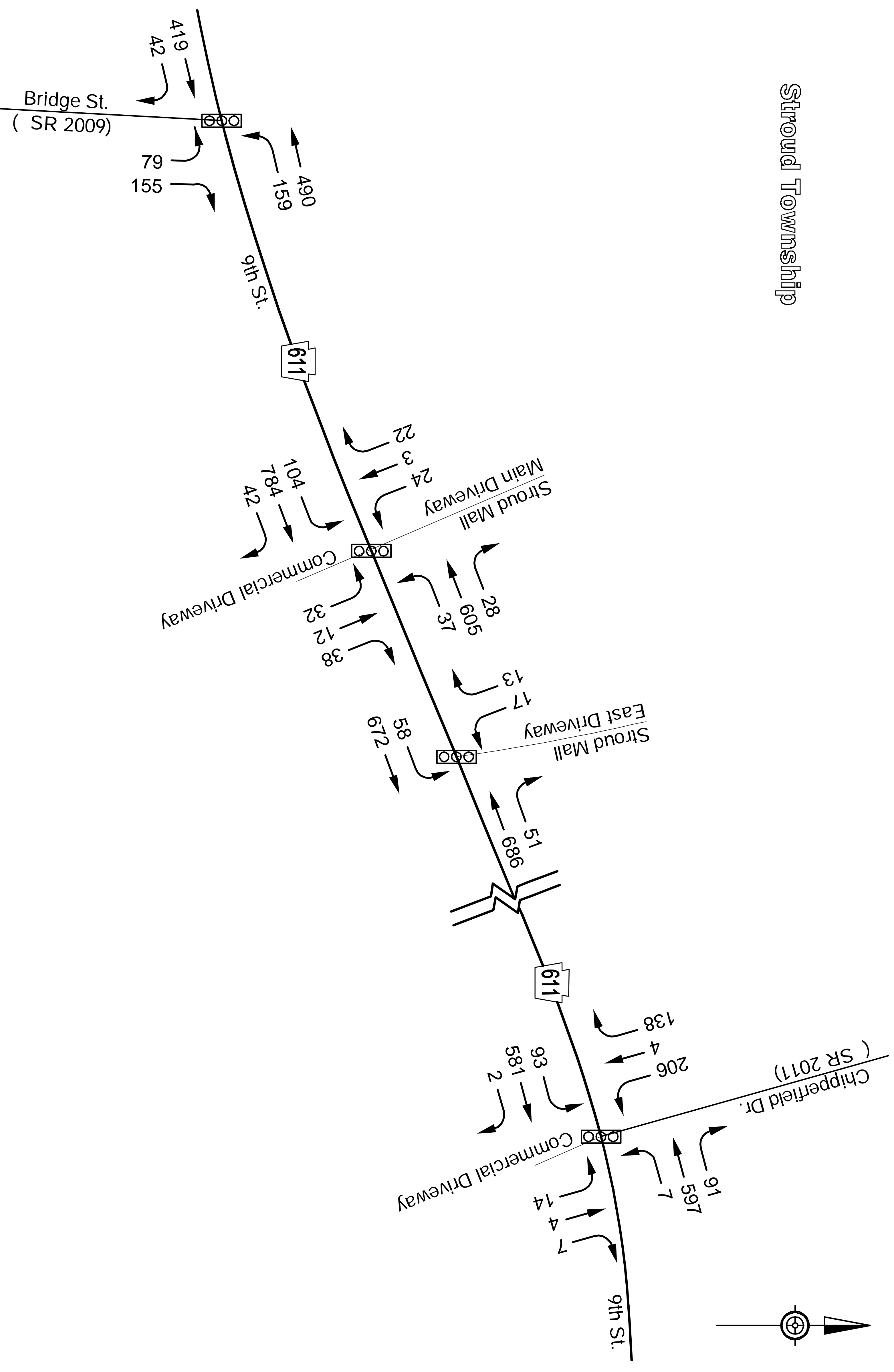
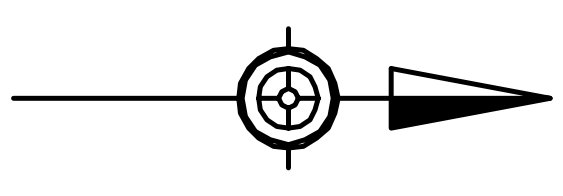
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FIGURE 2

ALTERNATIVE 2D PHASE II
A.M. PEAK HOUR
2045 TRAFFIC VOLUMES

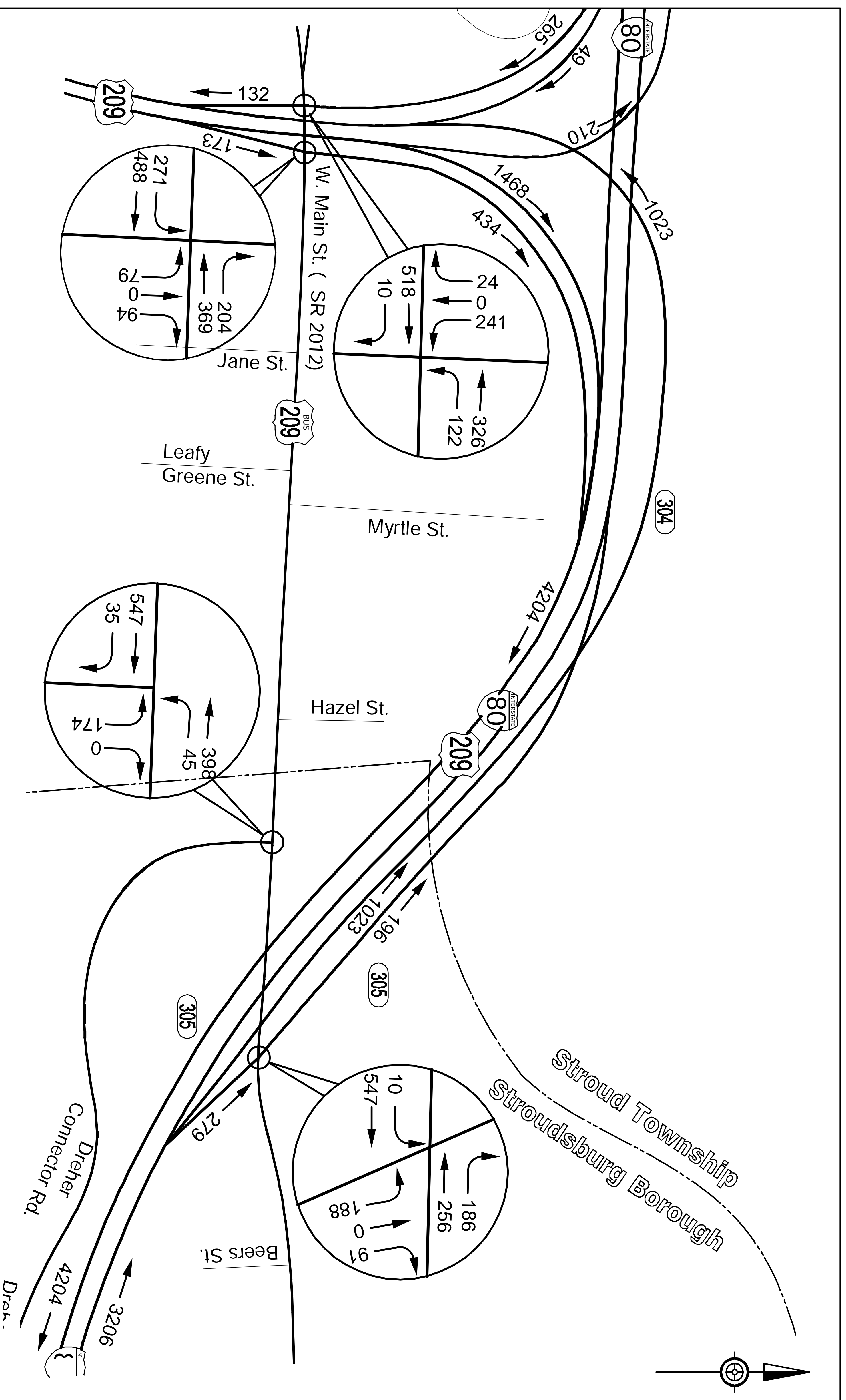
Stroud Township



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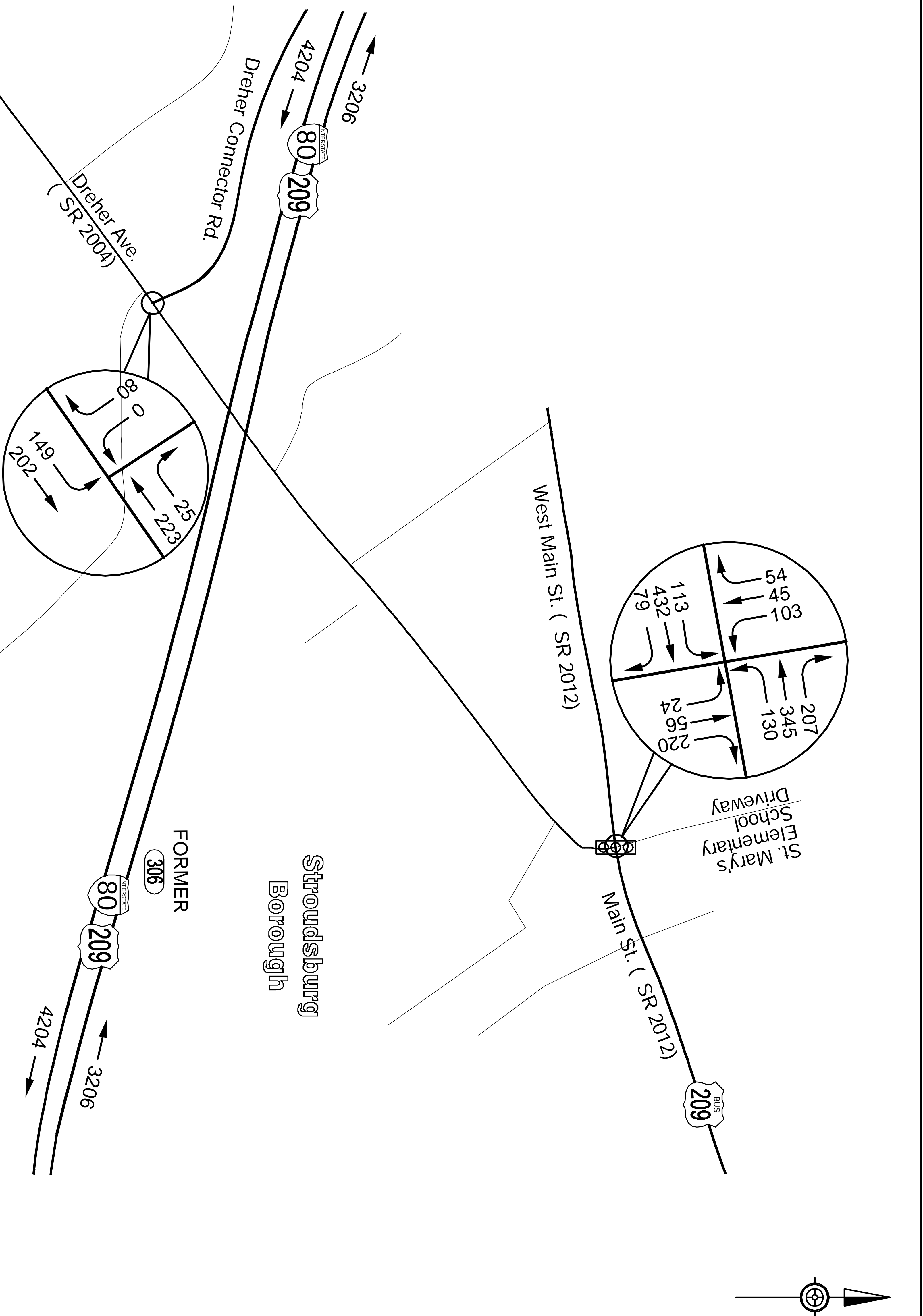
FIGURE 3
ALTERNATIVE 2D PHASE II
A.M. PEAK HOUR
2045 TRAFFIC VOLUMES



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FIGURE 4
 ALTERNATIVE 2D PHASE II
 A.M. PEAK HOUR
 2045 TRAFFIC VOLUMES



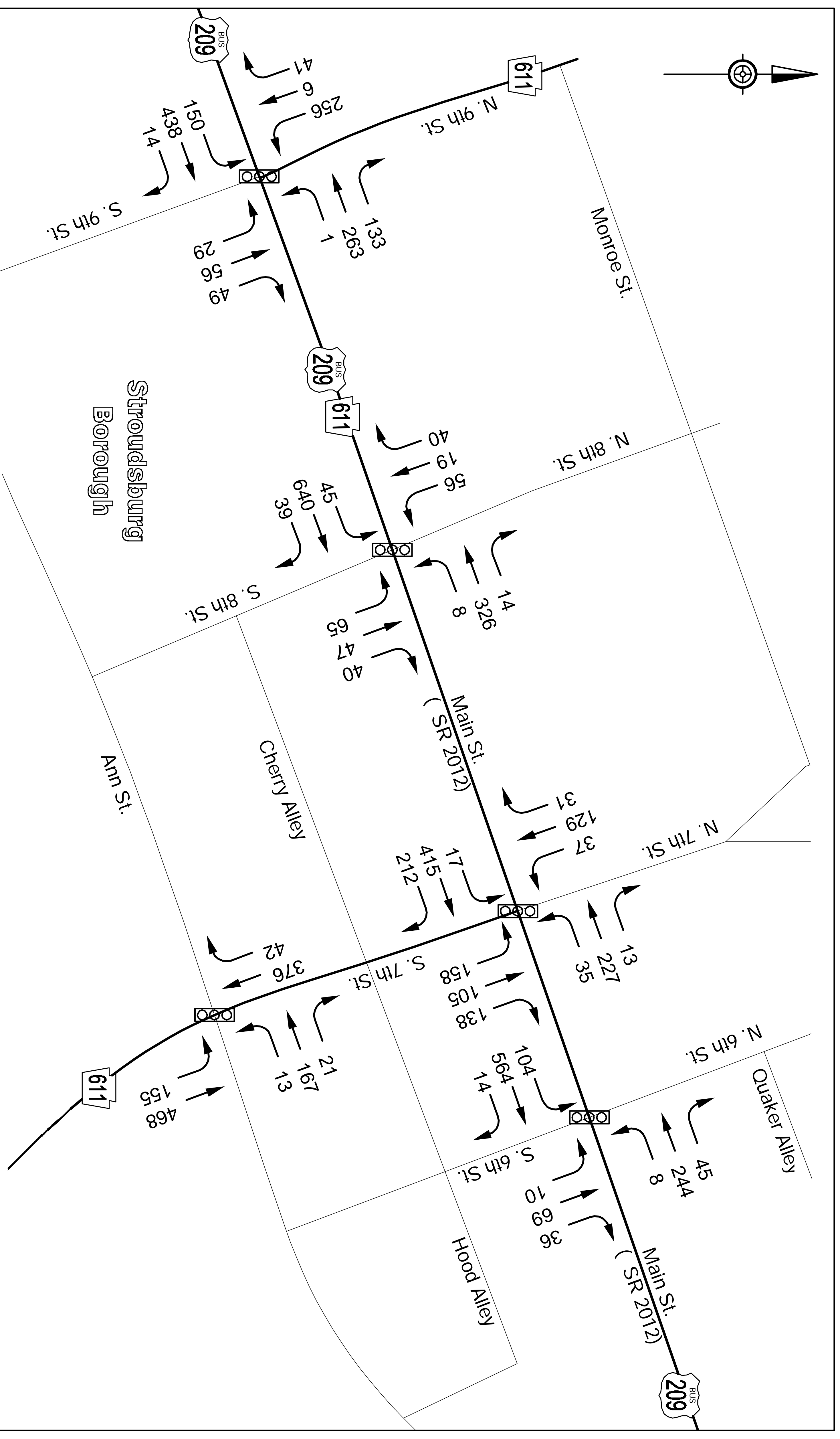
1700 Market Street - Suite 1600
Philadelphia, PA 19103

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Monroe County

FIGURE 5

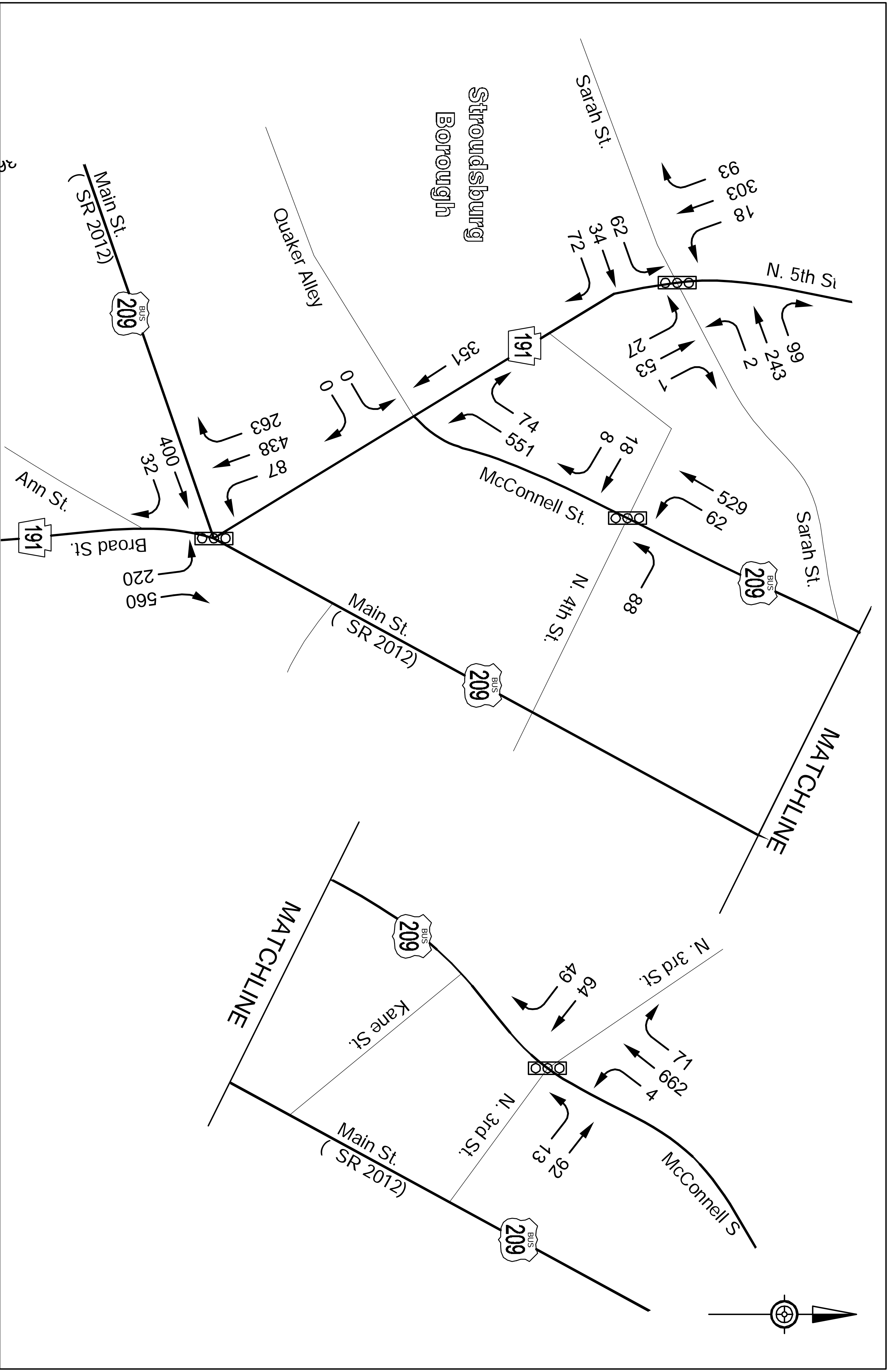
ALTERNATIVE 2D PHASE II
A.M. PEAK HOUR
2045 TRAFFIC VOLUMES



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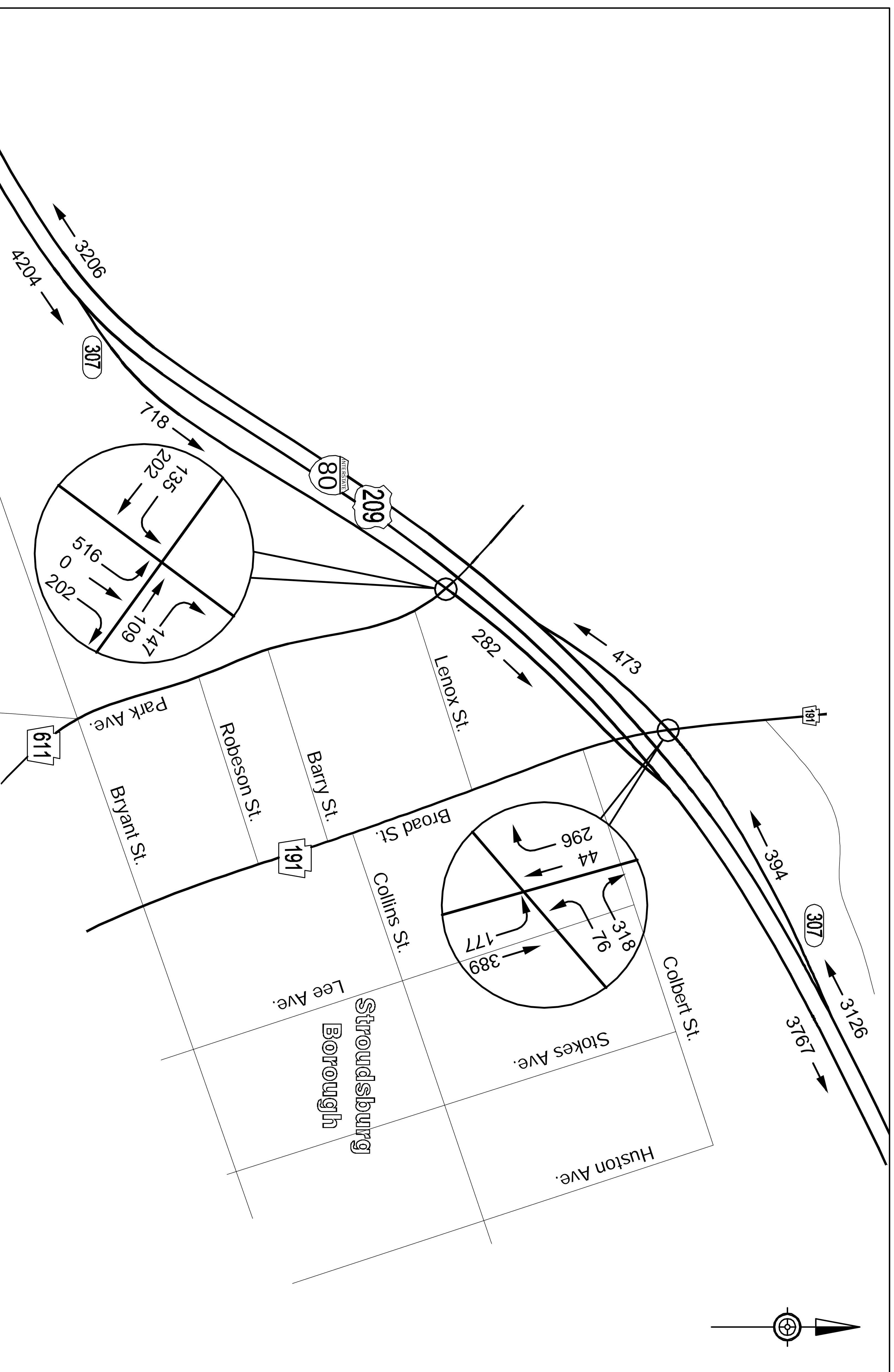
FIGURE 6
 ALTERNATIVE 2D PHASE II
 A.M. PEAK HOUR
 2045 TRAFFIC VOLUMES



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 Monroe County

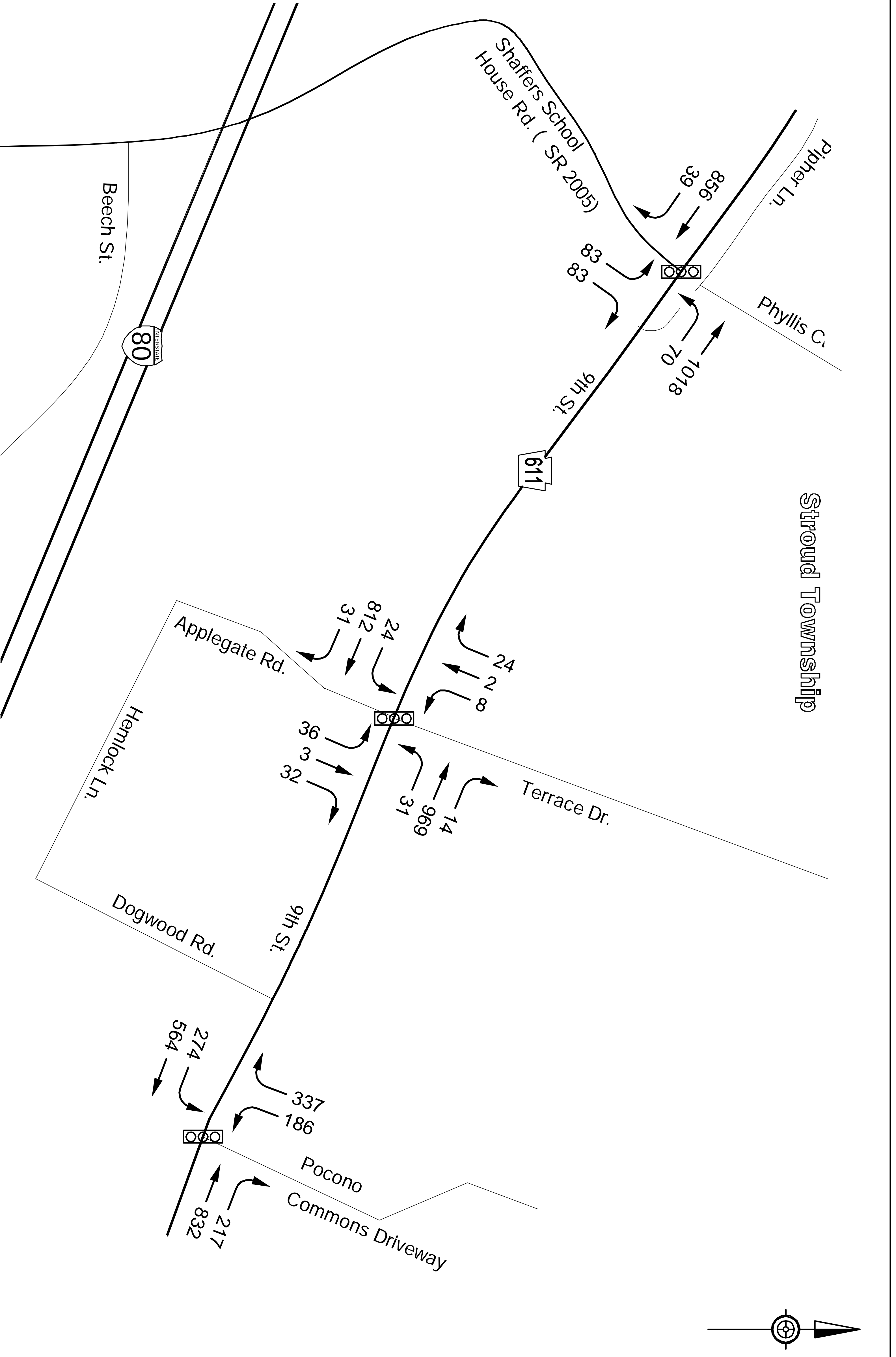
FIGURE 7
ALTERNATIVE 2D PHASE II
A.M. PEAK HOUR
2045 TRAFFIC VOLUMES



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Philadelphia, PA 19103

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Monroe County

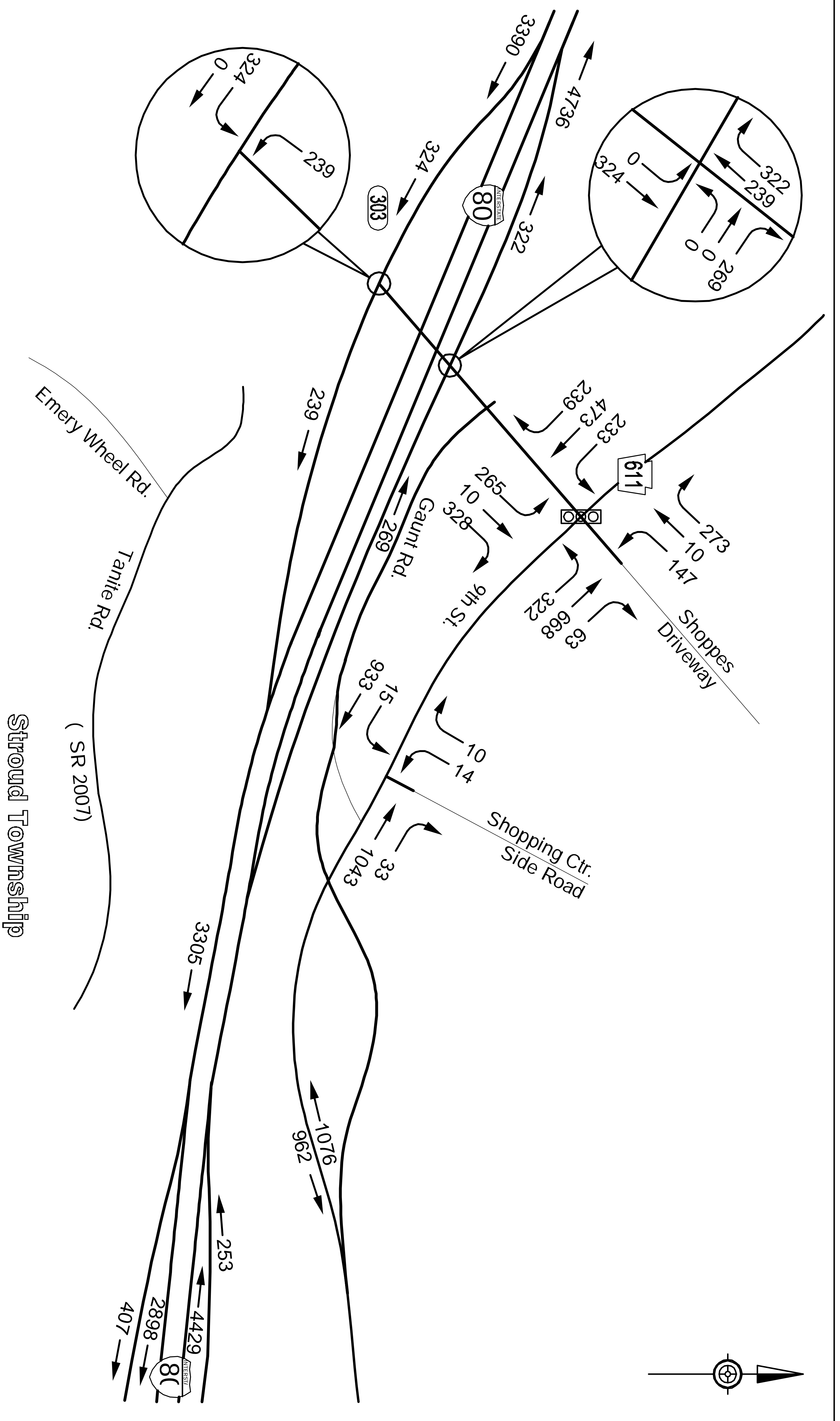
FIGURE 8
ALTERNATIVE 2D PHASE II
A.M. PEAK HOUR
2045 TRAFFIC VOLUMES



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 Monroe County

FIGURE 9
ALTERNATIVE 2D PHASE II
P.M. PEAK HOUR
2045 TRAFFIC VOLUMES



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Philadelphia, PA 19103

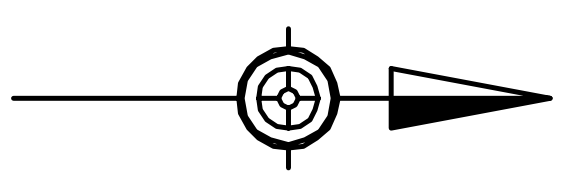
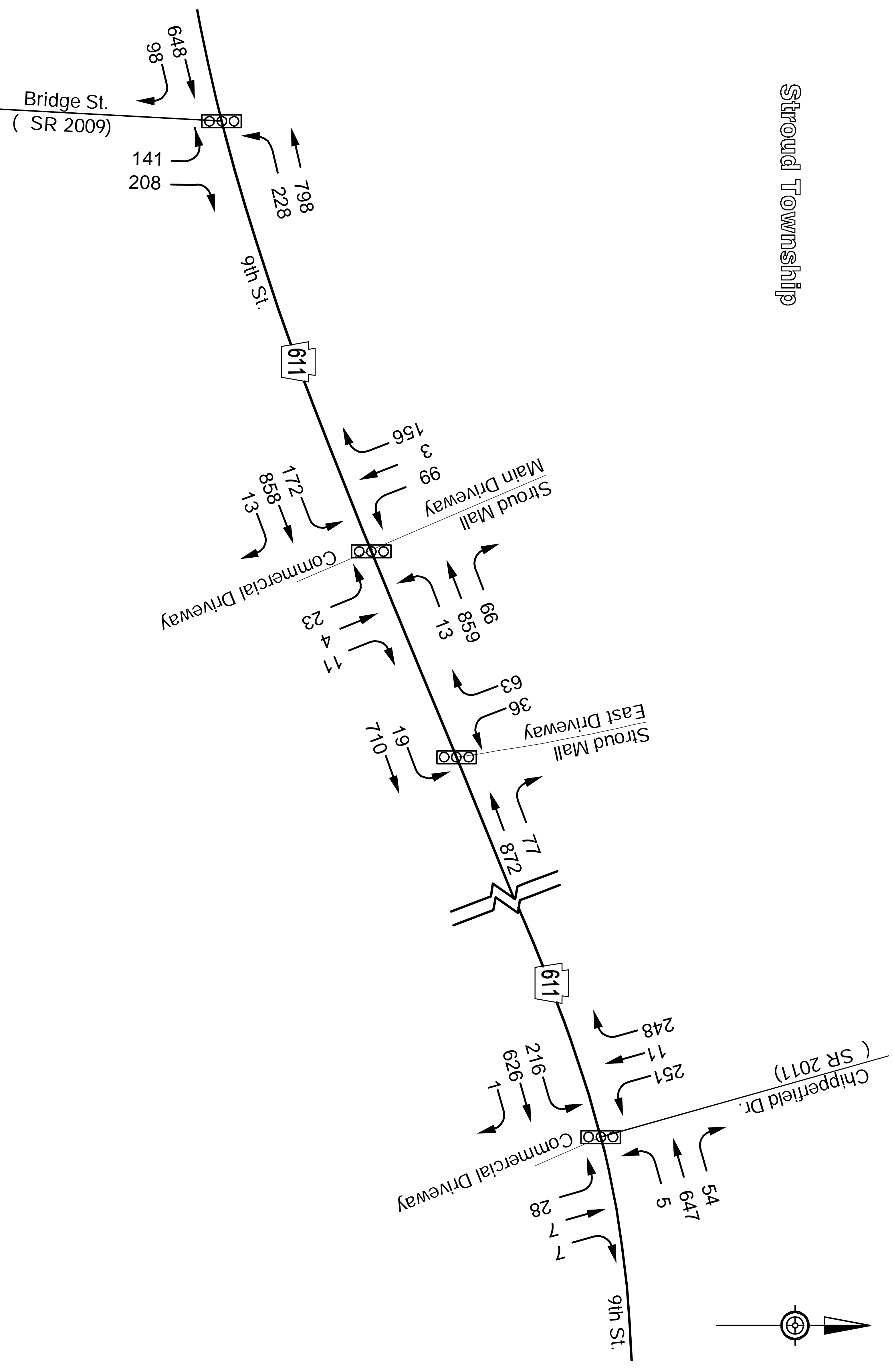
I-80 Reconstruction

Monroe County

Stroud Township

FIGURE 10
ALTERNATIVE 2D PHASE II
P.M. PEAK HOUR
2045 TRAFFIC VOLUMES

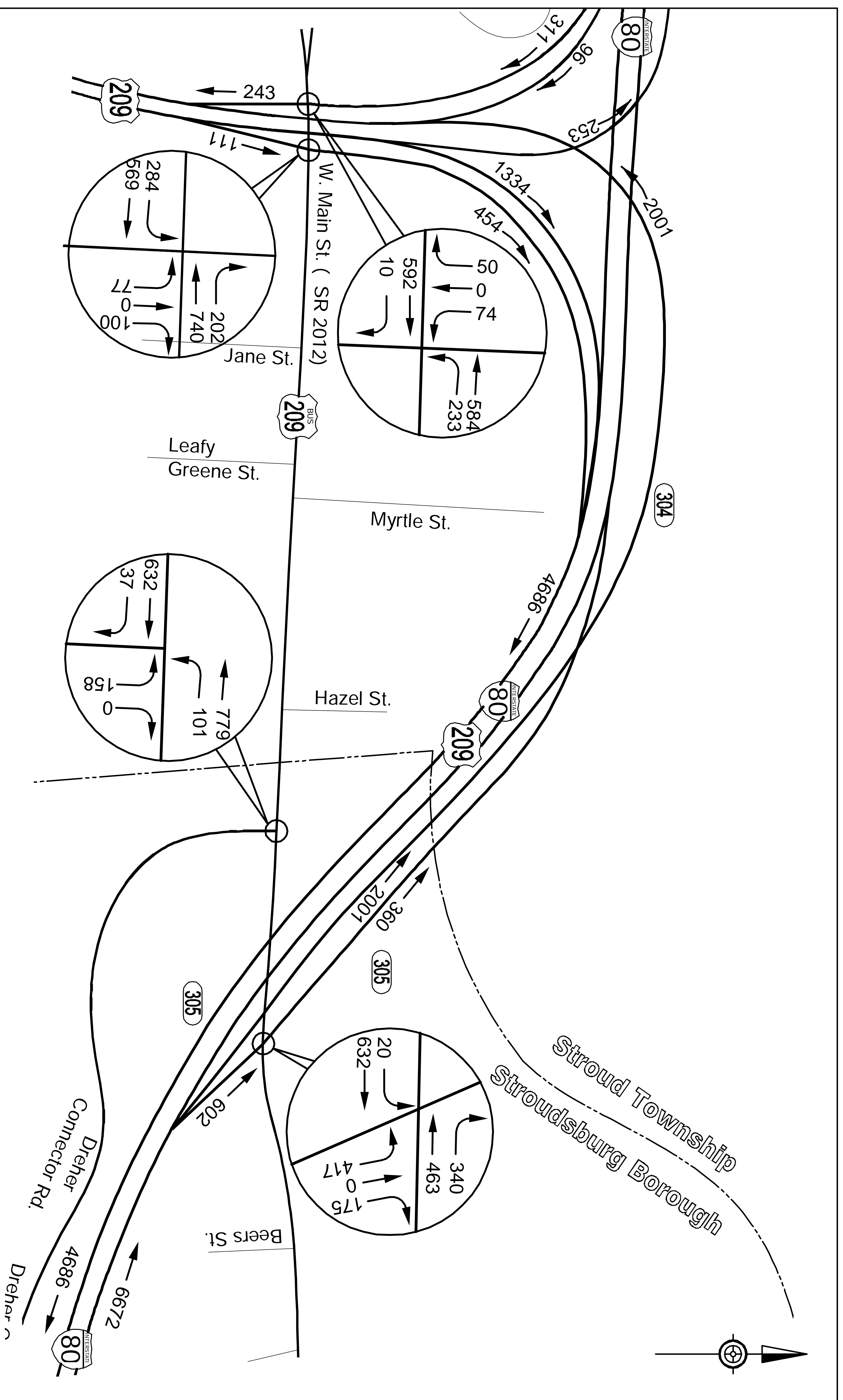
Stroud Township



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Monroe County

FIGURE 11
ALTERNATIVE 2D PHASE II
P.M. PEAK HOUR
2045 TRAFFIC VOLUMES

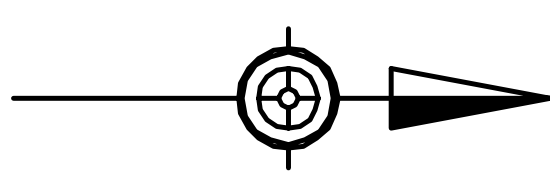
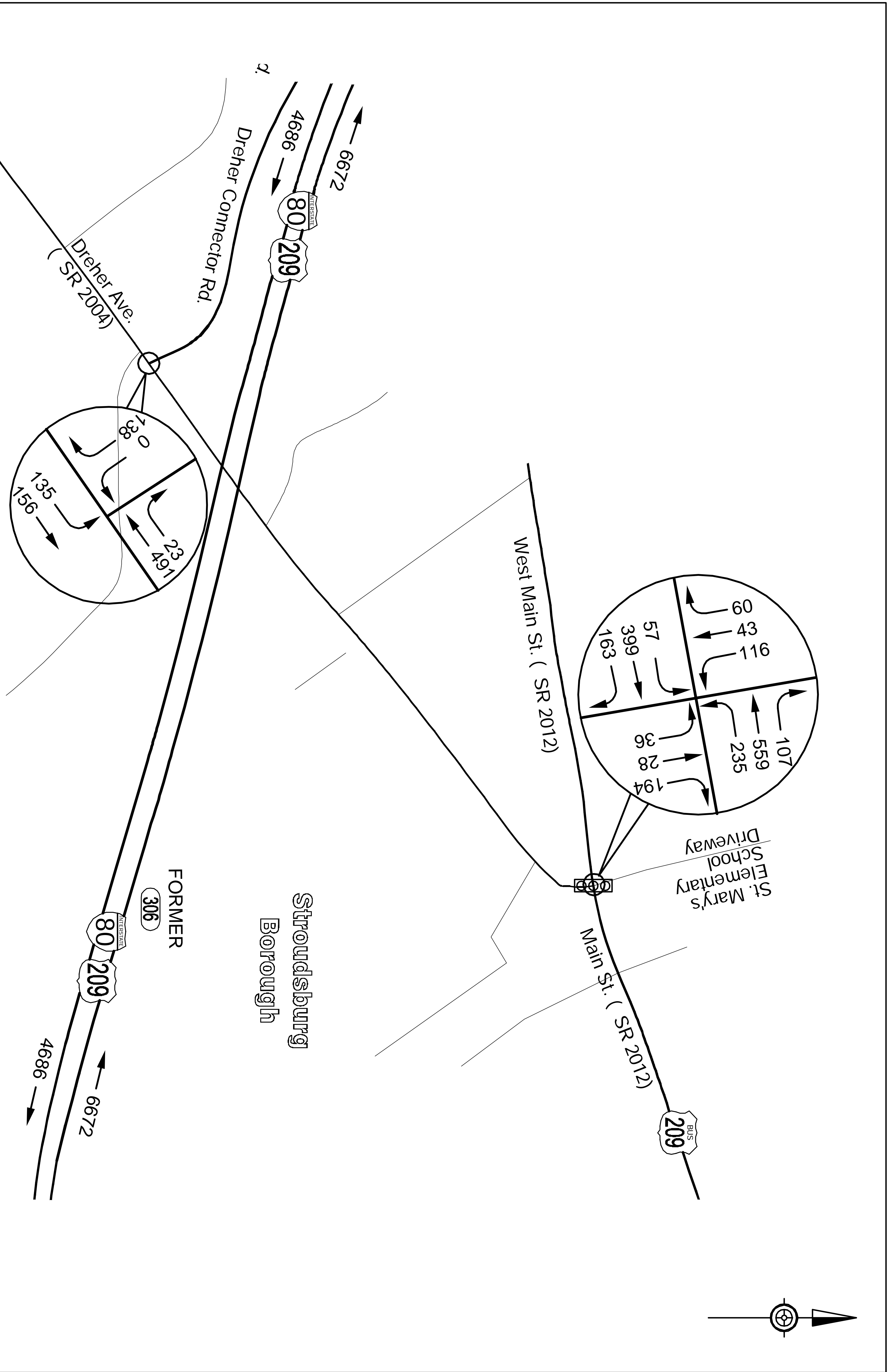


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FIGURE 12
 ALTERNATIVE 2D PHASE II
 P.M. PEAK HOUR
 2045 TRAFFIC VOLUMES



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Philadelphia, PA 19103

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Monroe County

FIGURE 13
ALTERNATIVE 2D PHASE II
P.M. PEAK HOUR
2045 TRAFFIC VOLUMES

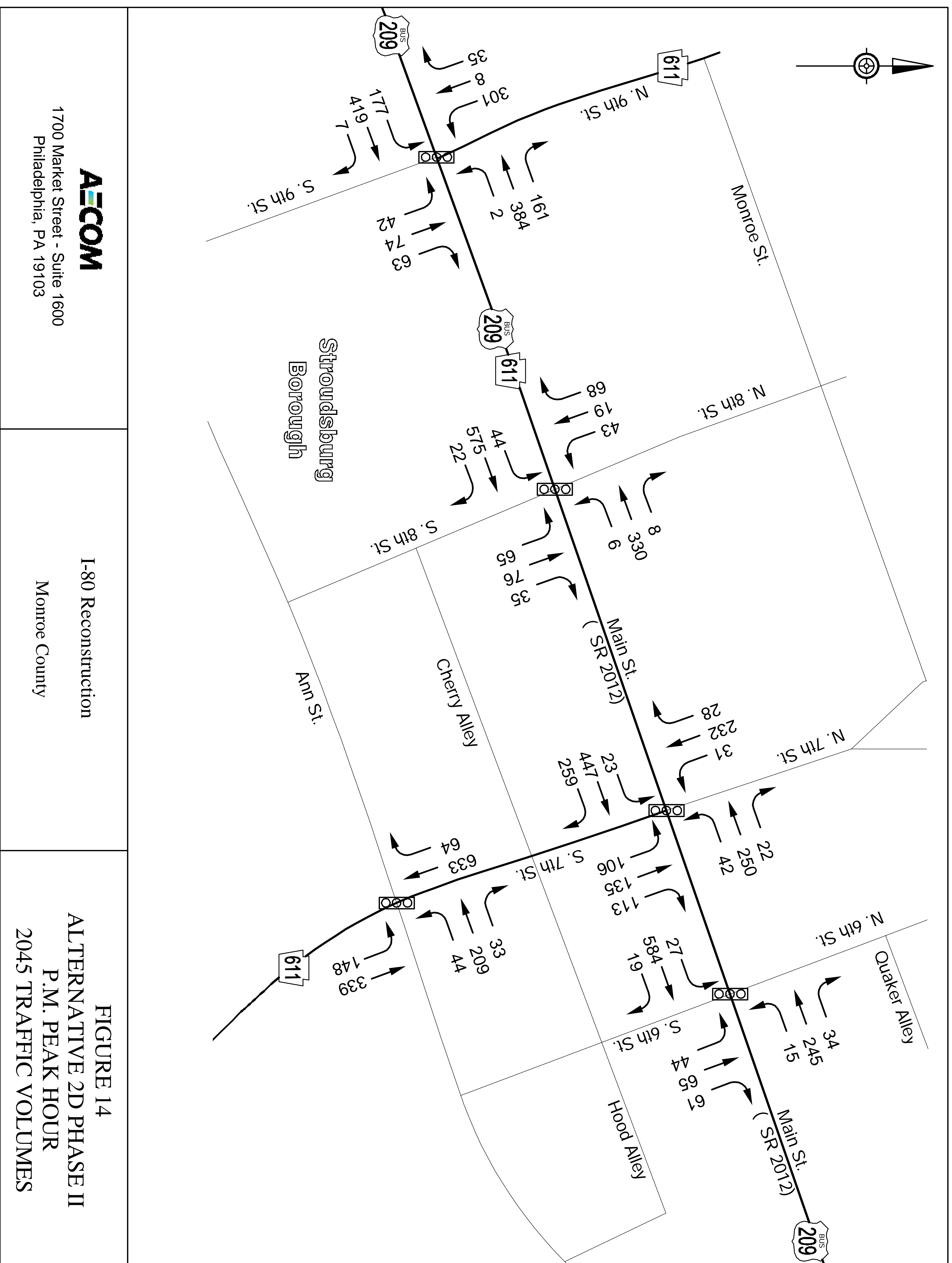
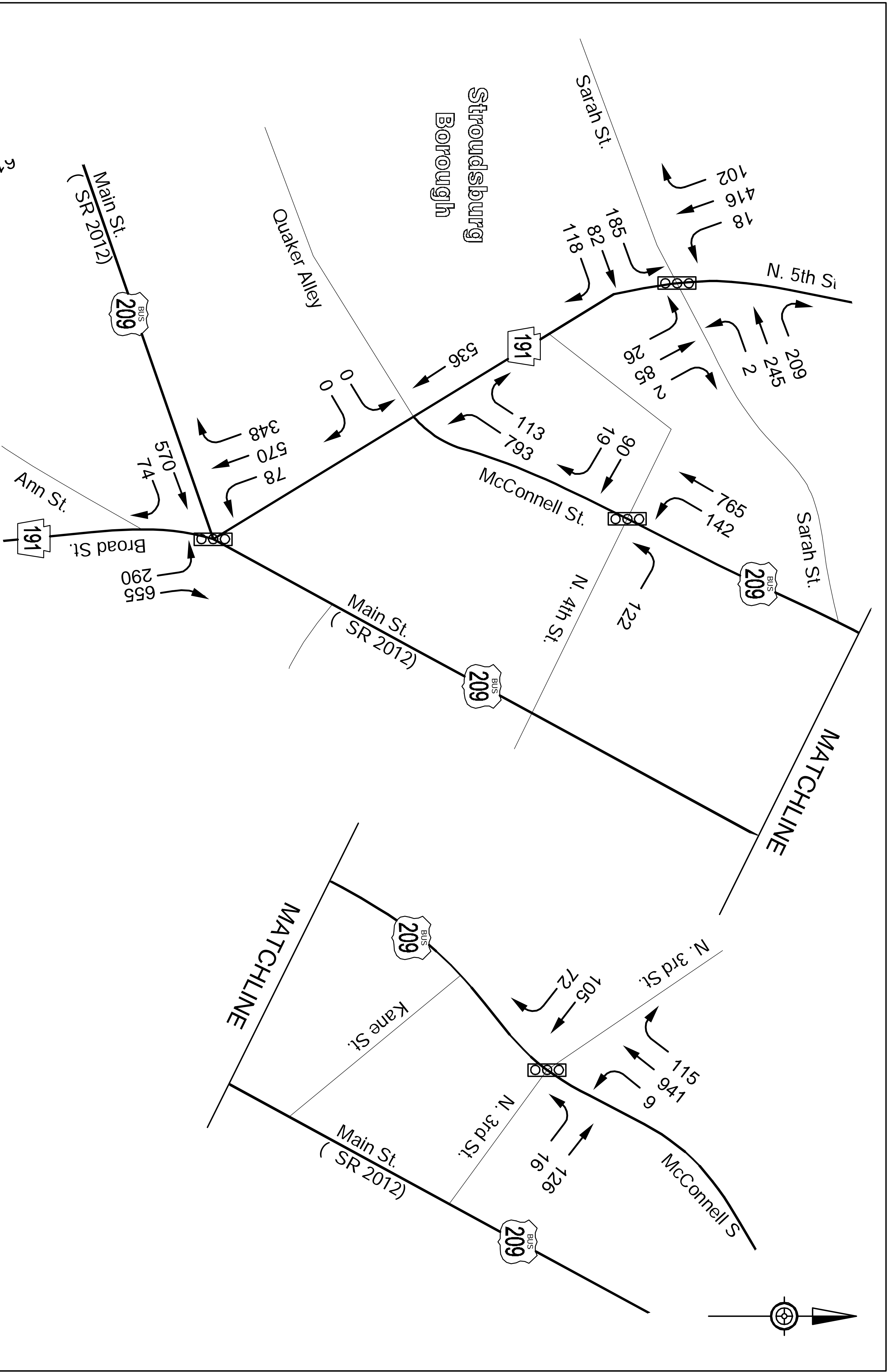


FIGURE 14
 ALTERNATIVE 2D PHASE II
 P.M. PEAK HOUR
 2045 TRAFFIC VOLUMES

I-80 Reconstruction
 Monroe County

AECOM
 1700 Market Street - Suite 1600
 Philadelphia, PA 19103

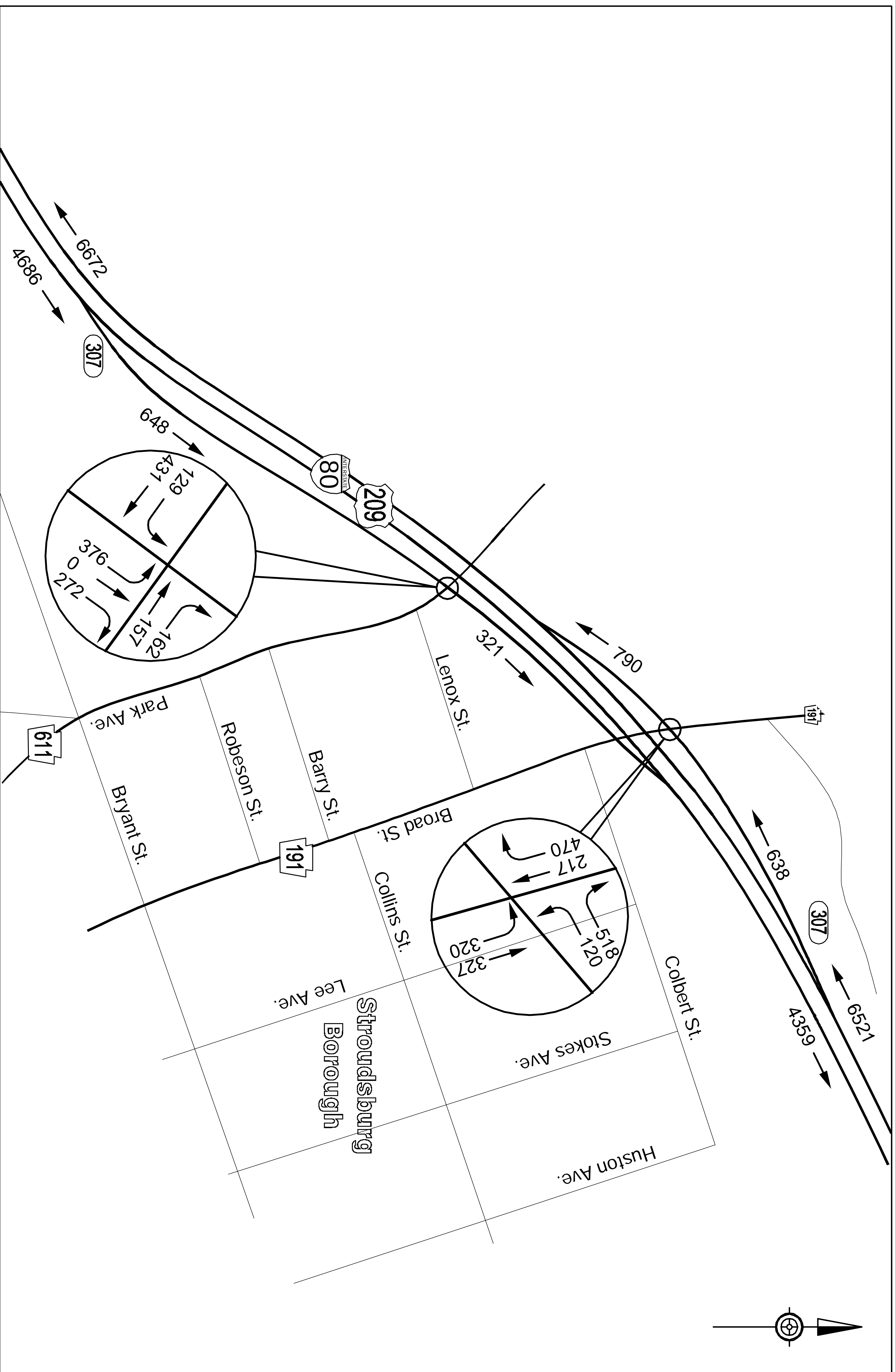


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Monroe County

FIGURE 15
ALTERNATIVE 2D PHASE II
P.M. PEAK HOUR
2045 TRAFFIC VOLUMES



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Monroe County

FIGURE 16
 ALTERNATIVE 2D PHASE II
 P.M. PEAK HOUR
 2045 TRAFFIC VOLUMES

2045 TRAFFIC VOLUME MAPS

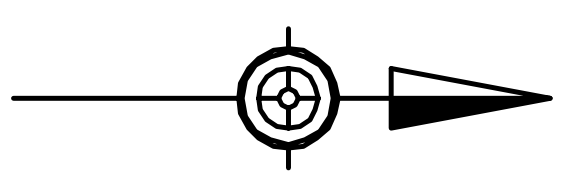
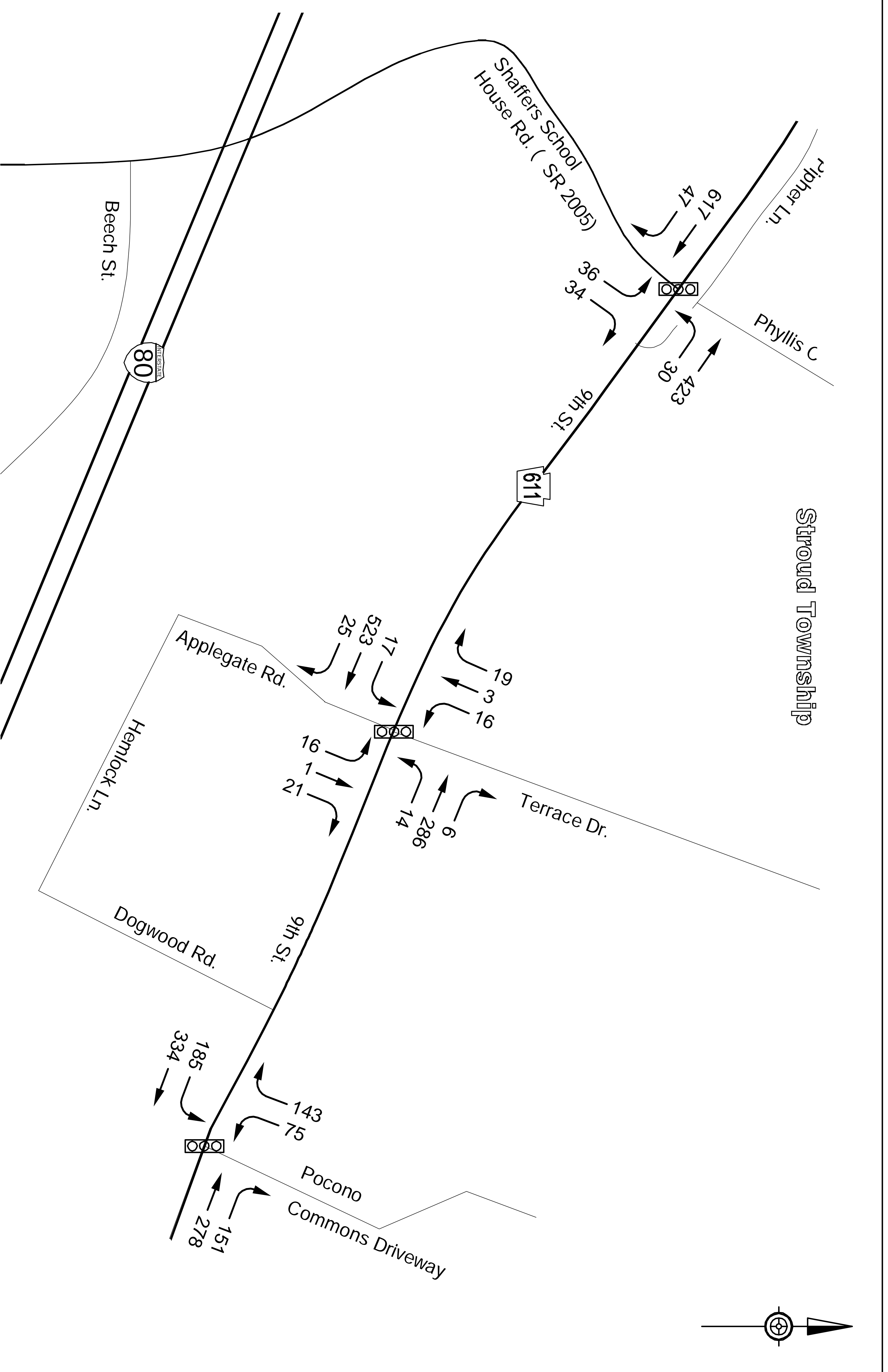


FIGURE 1

NO-BUILD

A.M. PEAK HOUR

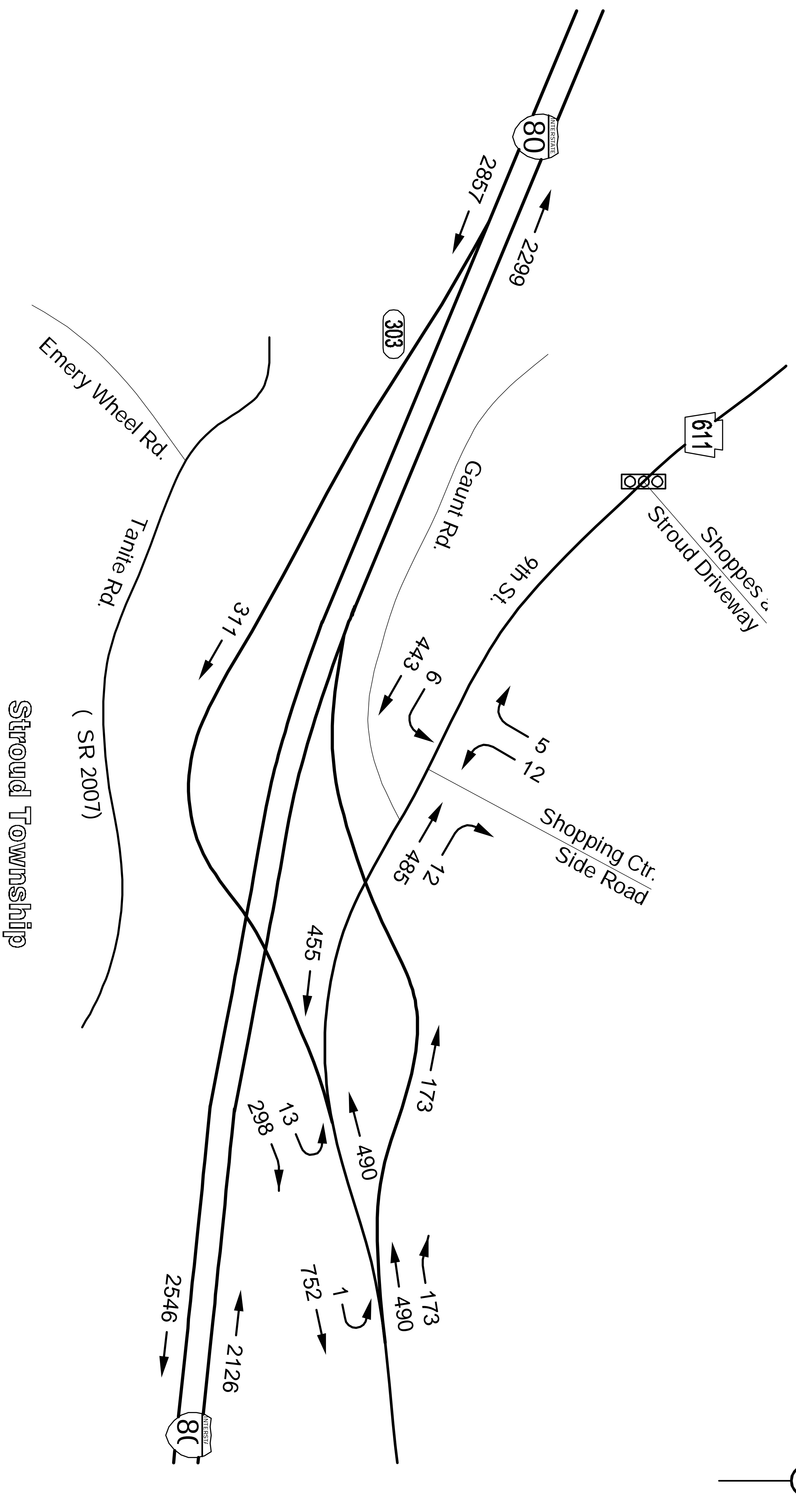
2045 TRAFFIC VOLUMES



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Monroe County

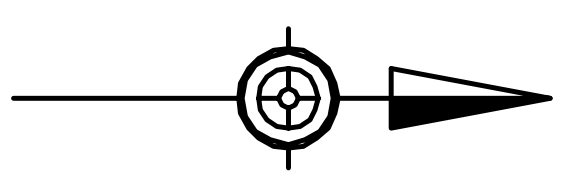
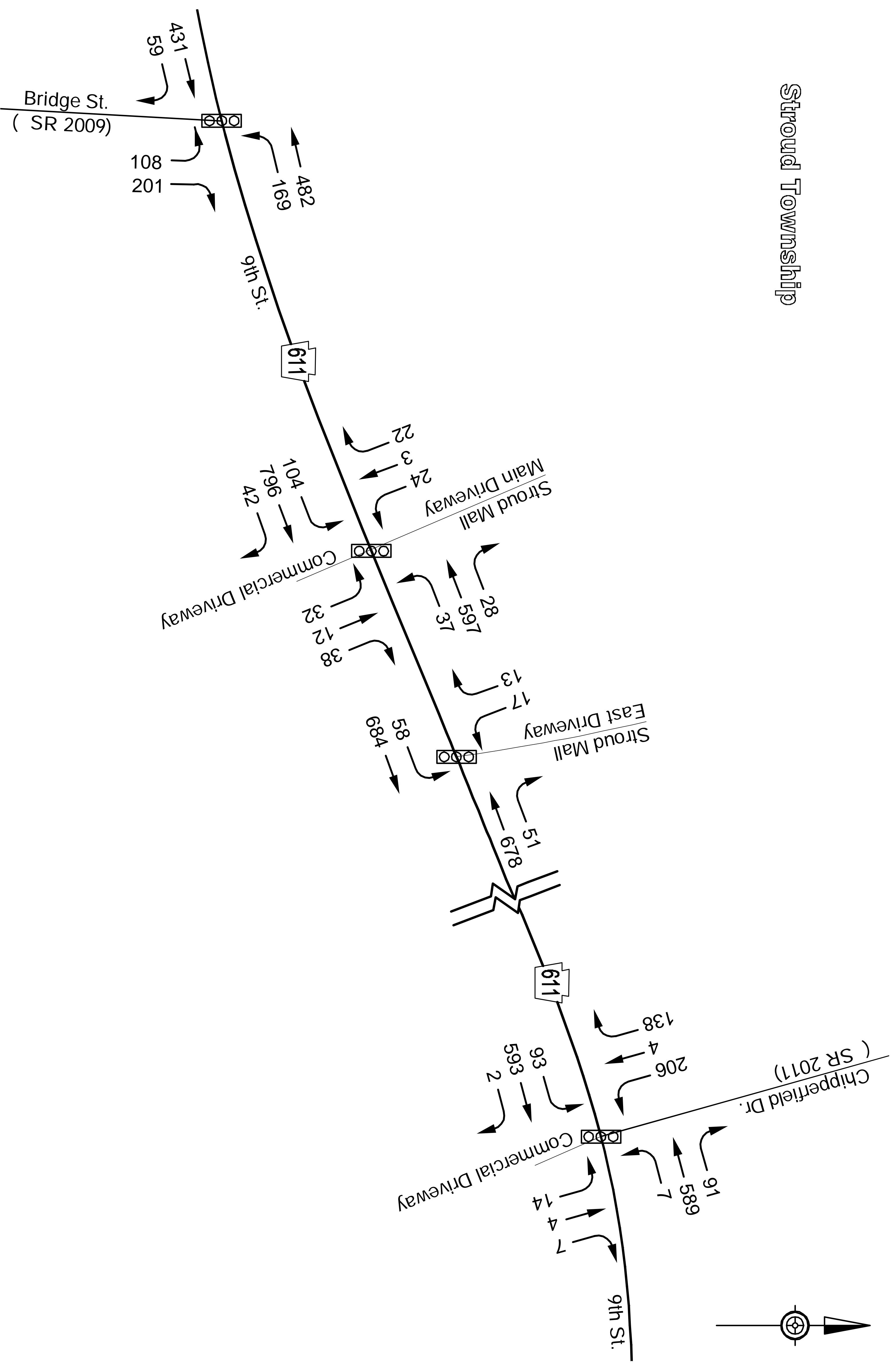


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FIGURE 2
NO-BUILD
A.M. PEAK HOUR
2045 TRAFFIC VOLUMES

Stroud Township



1700 Market Street - Suite 1600
Philadelphia, PA 19103

I-80 Reconstruction
Monroe County

FIGURE 3
NO-BUILD
A.M. PEAK HOUR
2045 TRAFFIC VOLUMES

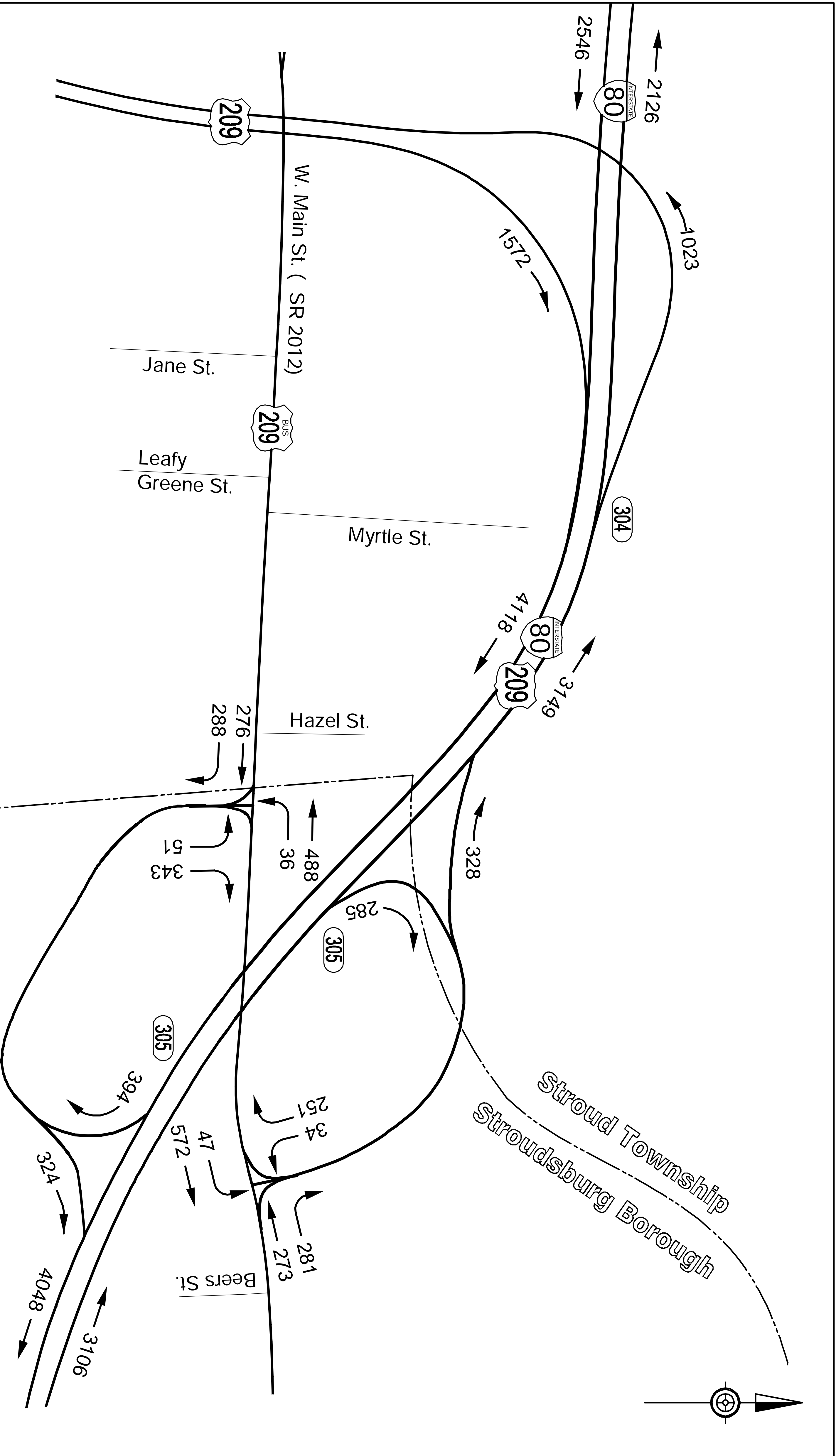
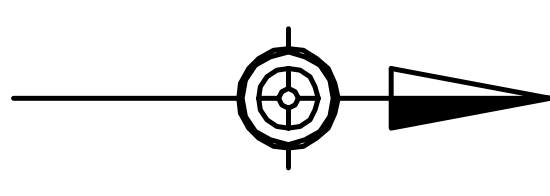
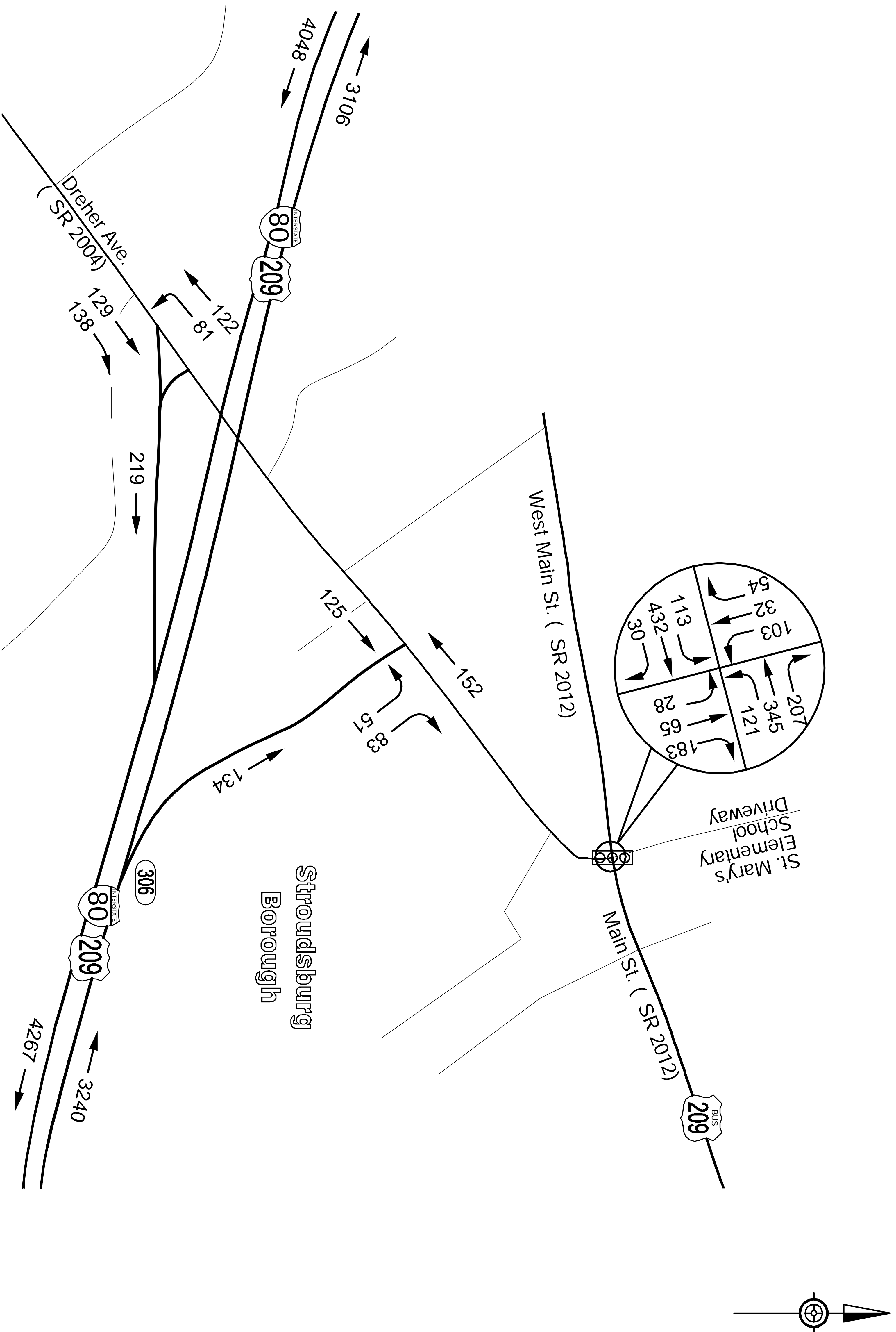


FIGURE 4
NO-BUILD
A.M. PEAK HOUR
2045 TRAFFIC VOLUMES

I-80 Reconstruction
 Monroe County

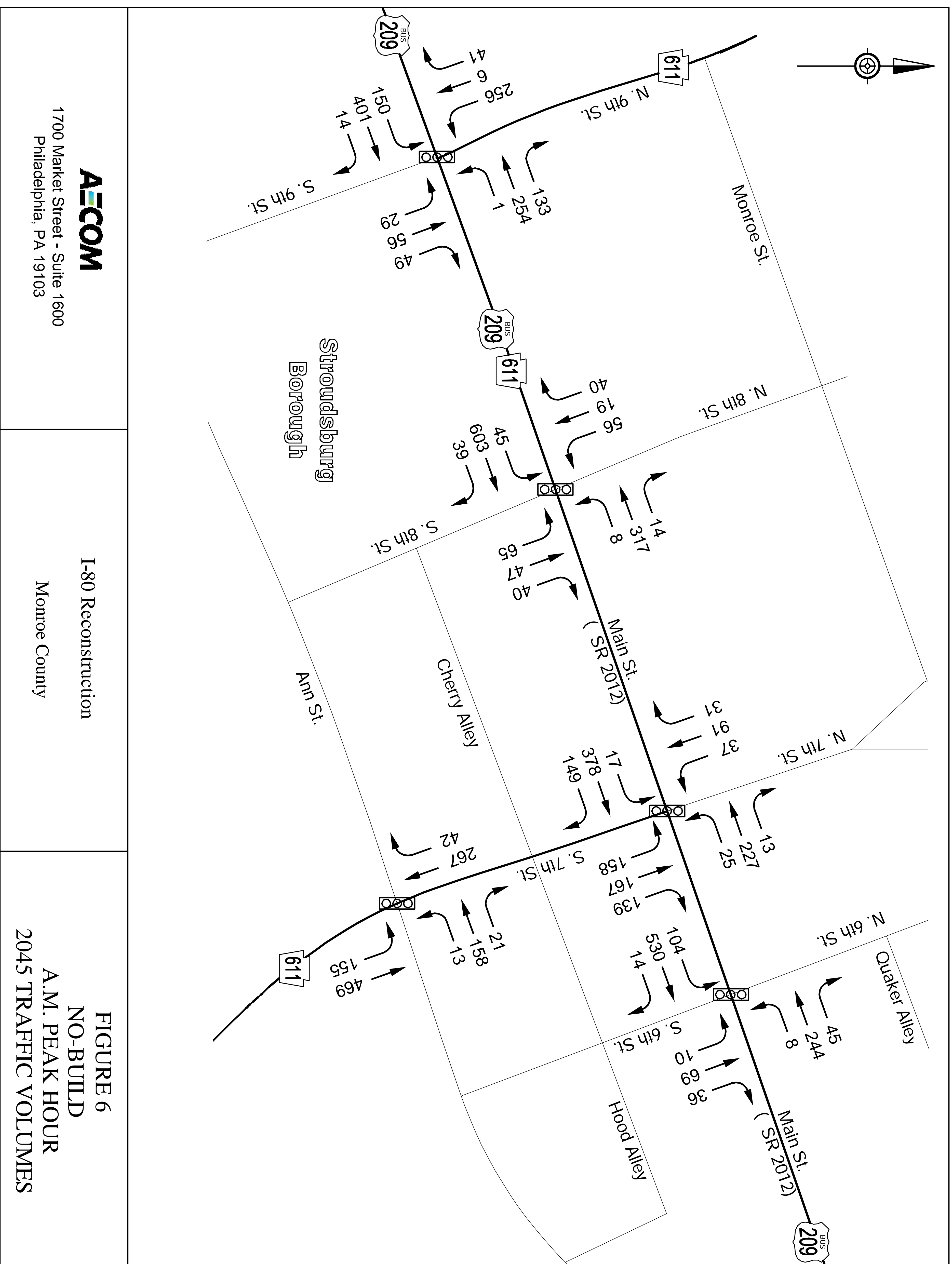
AECOM
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1700 Market Street - Suite 1600
Philadelphia, PA 19103

I-80 Reconstruction
Monroe County

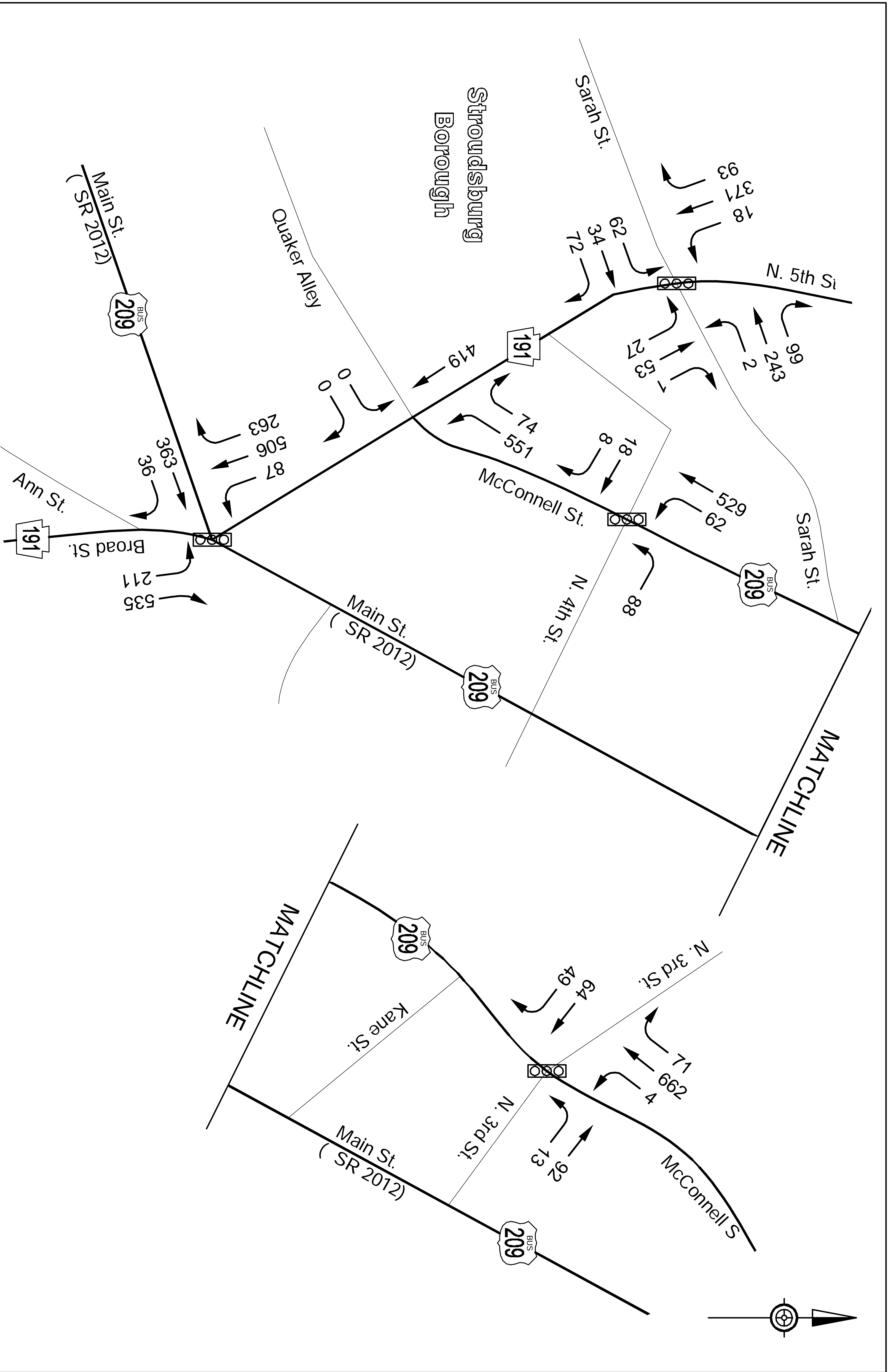
FIGURE 5
NO-BUILD
A.M. PEAK HOUR
2045 TRAFFIC VOLUMES



1700 Market Street - Suite 1600
Philadelphia, PA 19103

I-80 Reconstruction
Monroe County

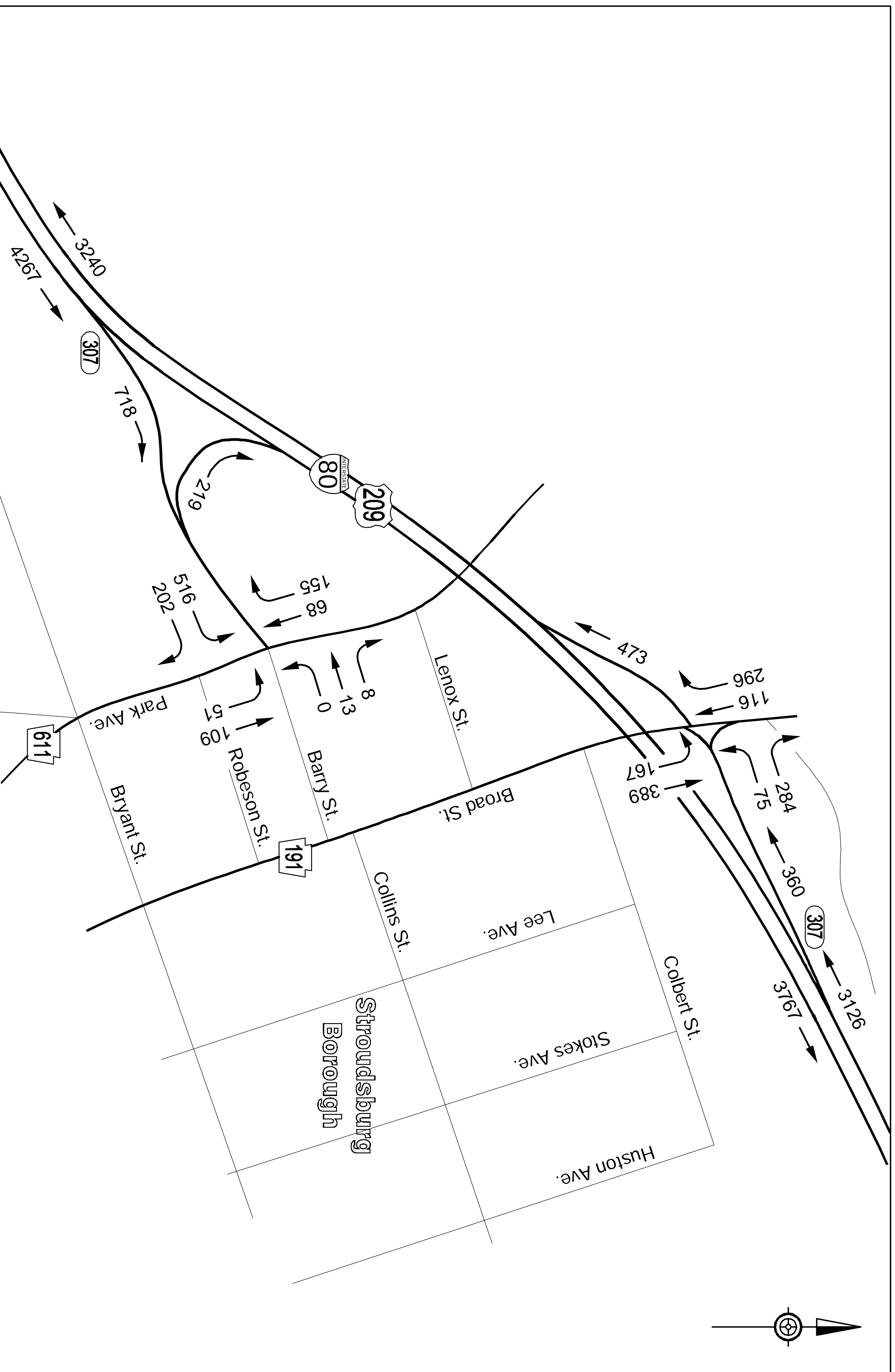
FIGURE 6
NO-BUILD
A.M. PEAK HOUR
2045 TRAFFIC VOLUMES



1700 Market Street - Suite 1600
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I-80 Reconstruction
Monroe County

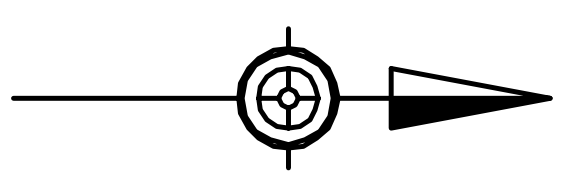
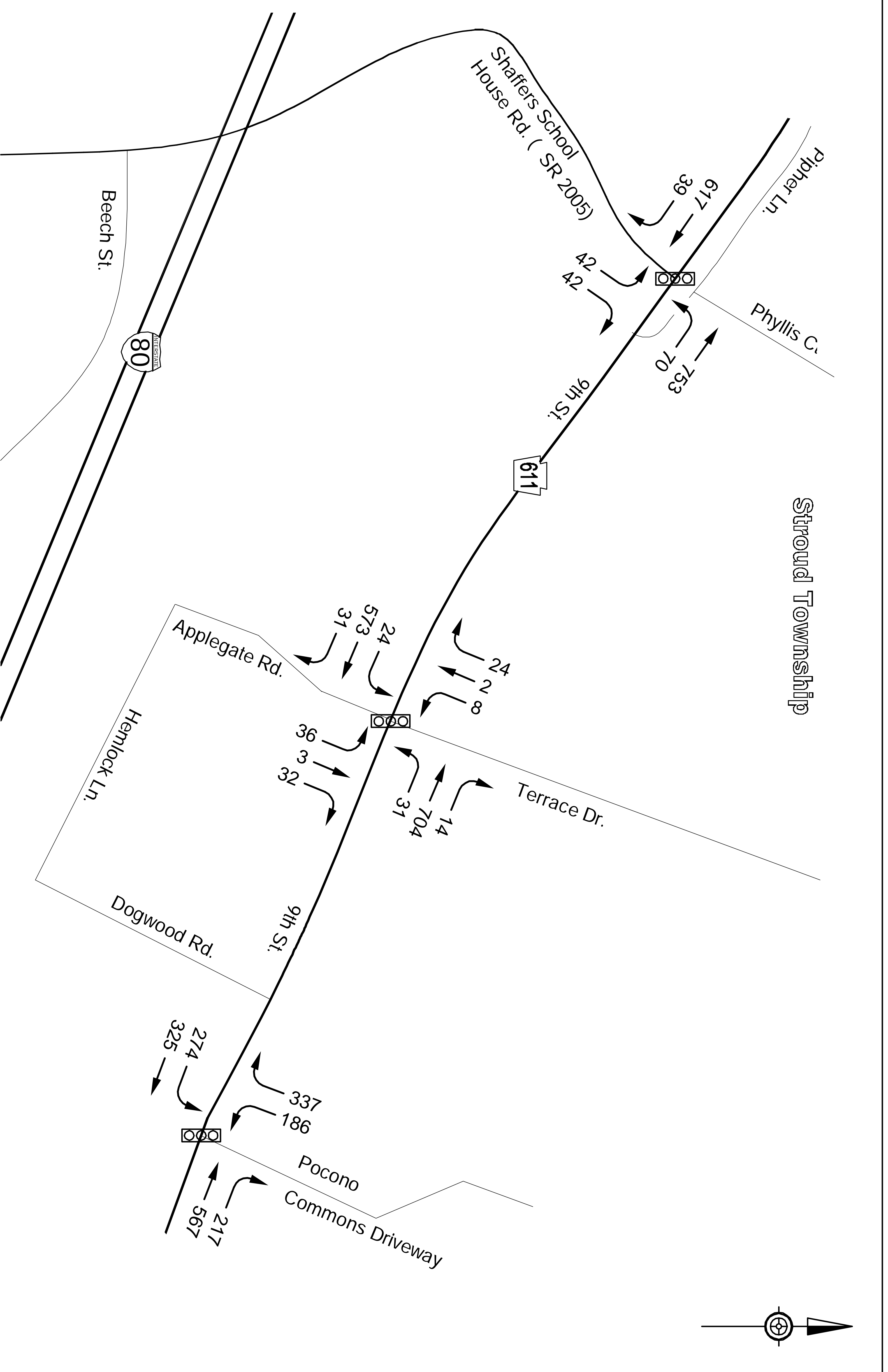
FIGURE 7
NO-BUILD
A.M. PEAK HOUR
2045 TRAFFIC VOLUMES



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 Philadelphia, PA 19103

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 Monroe County

FIGURE 8
NO-BUILD
A.M. PEAK HOUR
2045 TRAFFIC VOLUMES



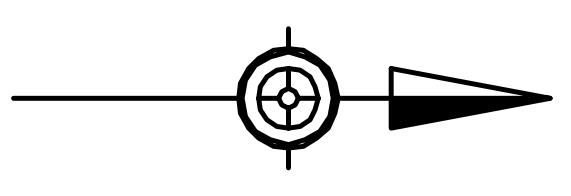
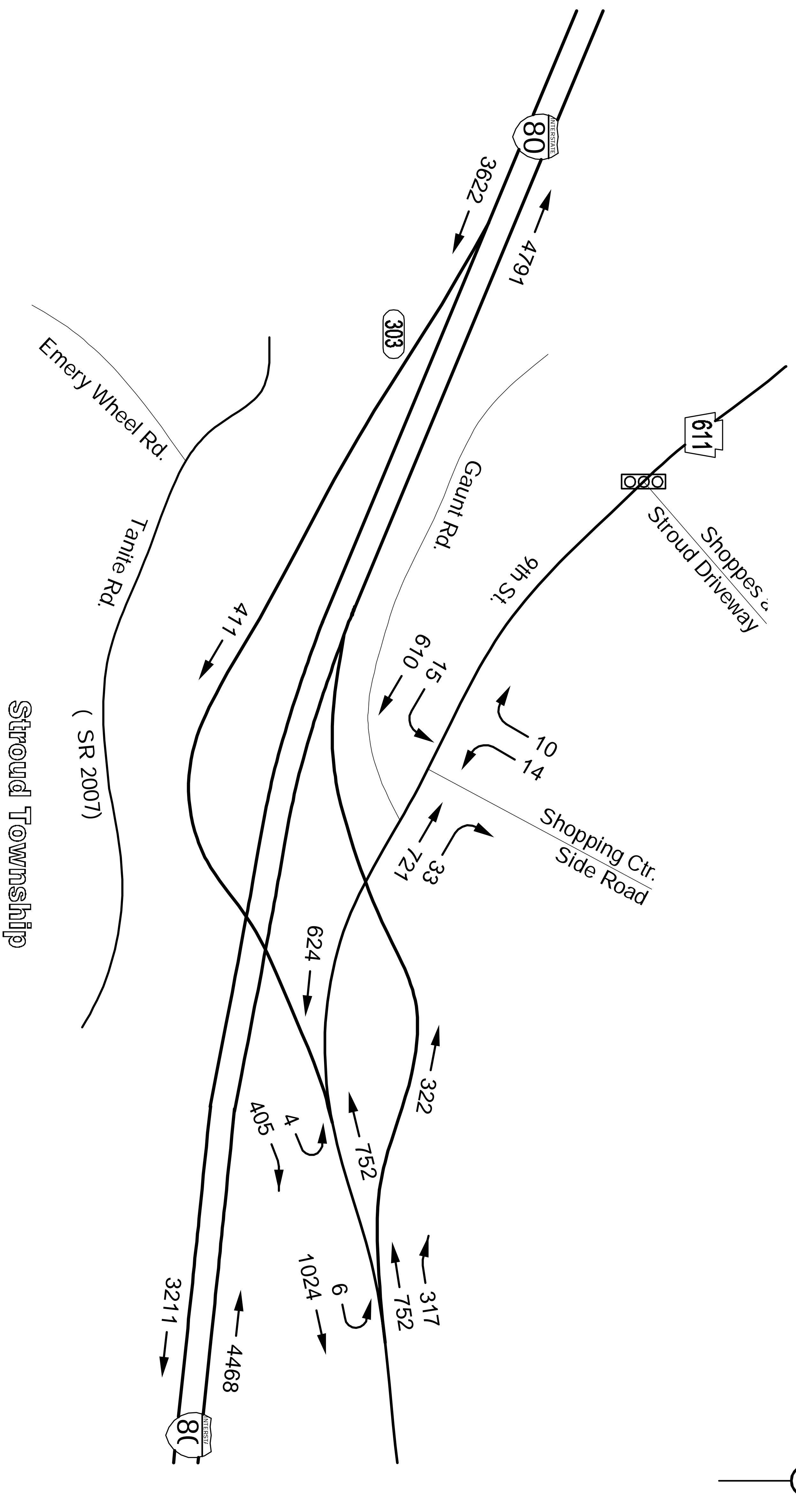
Stroud Township



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I-80 Reconstruction
Monroe County

FIGURE 9
NO-BUILD
P.M. PEAK HOUR
2045 TRAFFIC VOLUMES



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Philadelphia, PA 19103

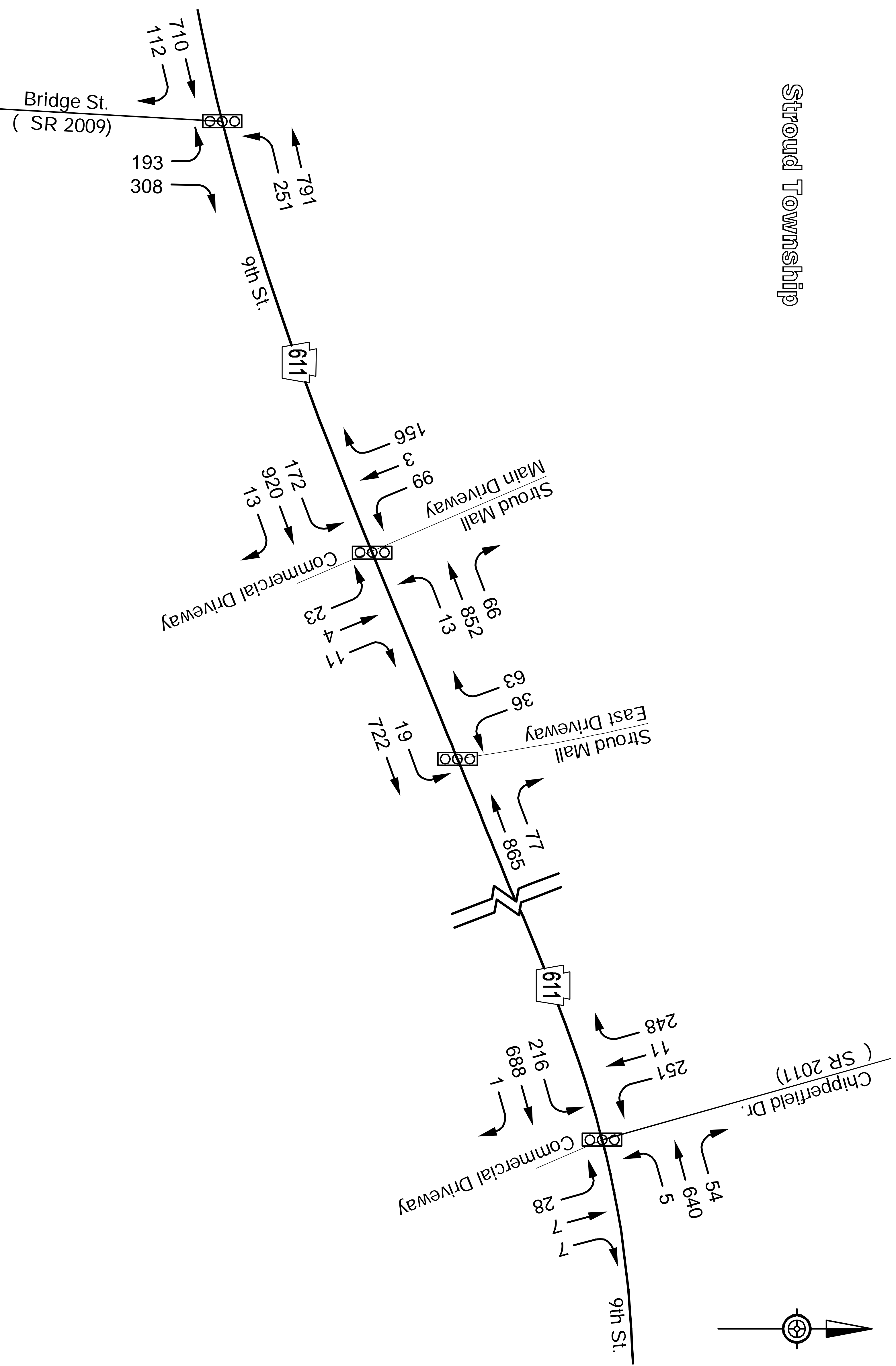
I-80 Reconstruction

Monroe County

Stroud Township

FIGURE 10
NO-BUILD
P.M. PEAK HOUR
2045 TRAFFIC VOLUMES

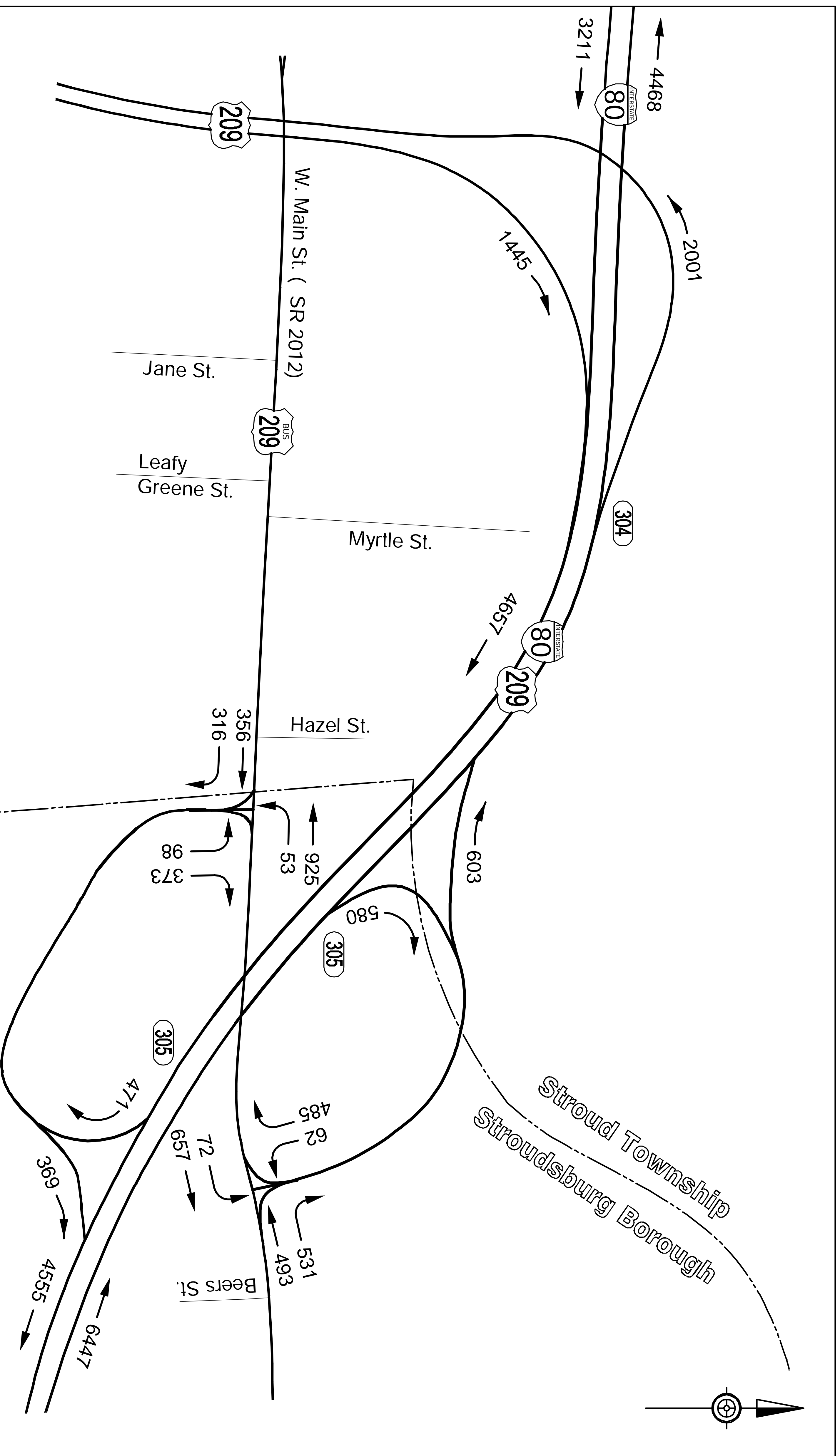
Stroud Township



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 Monroe County

FIGURE 11
 NO-BUILD
 P.M. PEAK HOUR
 2045 TRAFFIC VOLUMES

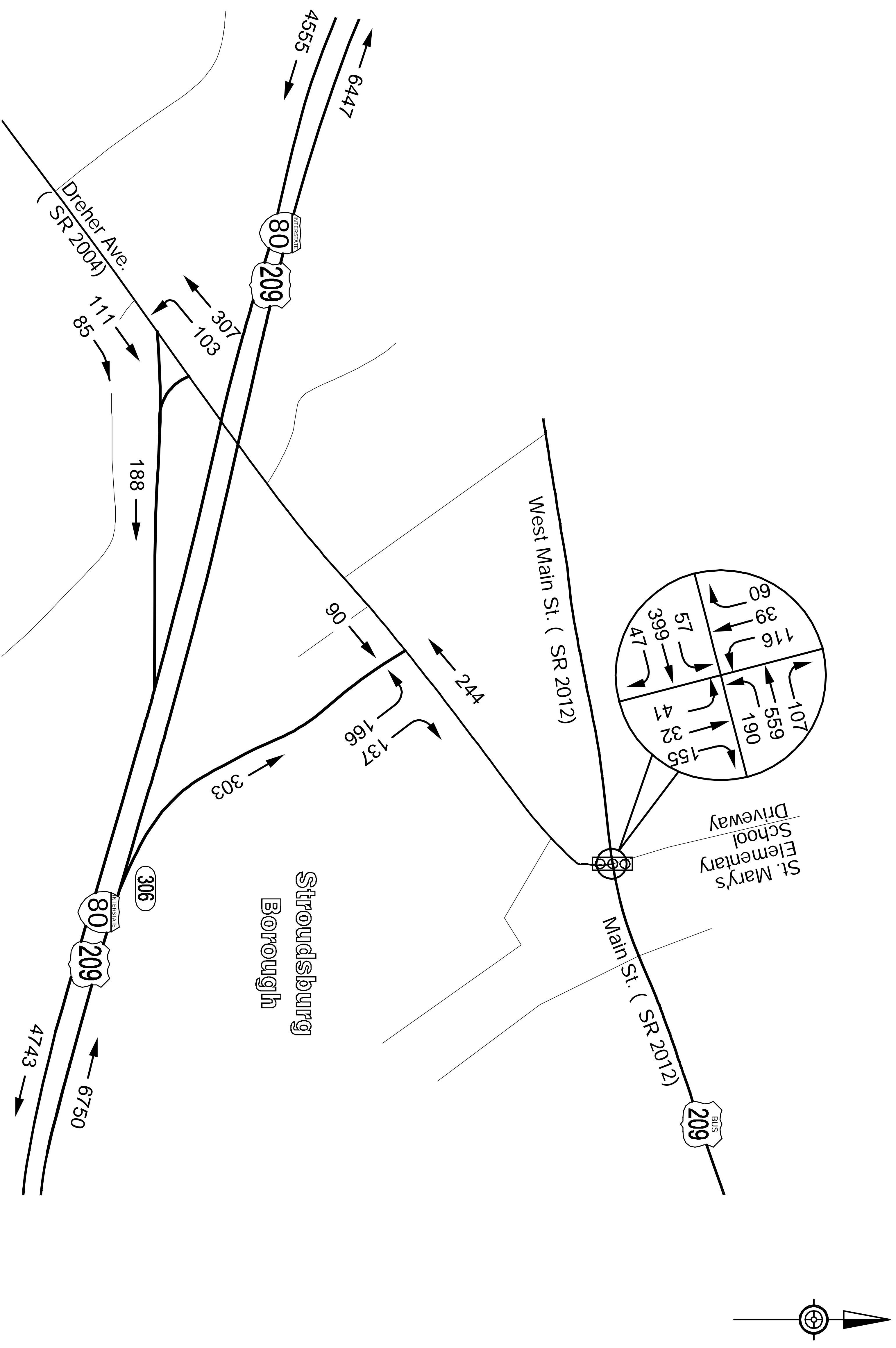


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I-80 Reconstruction

Monroe County

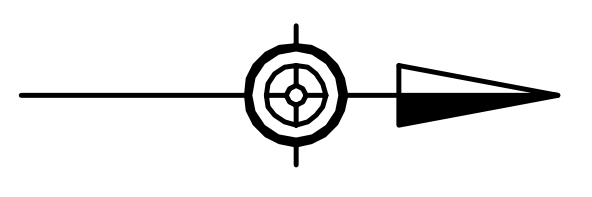
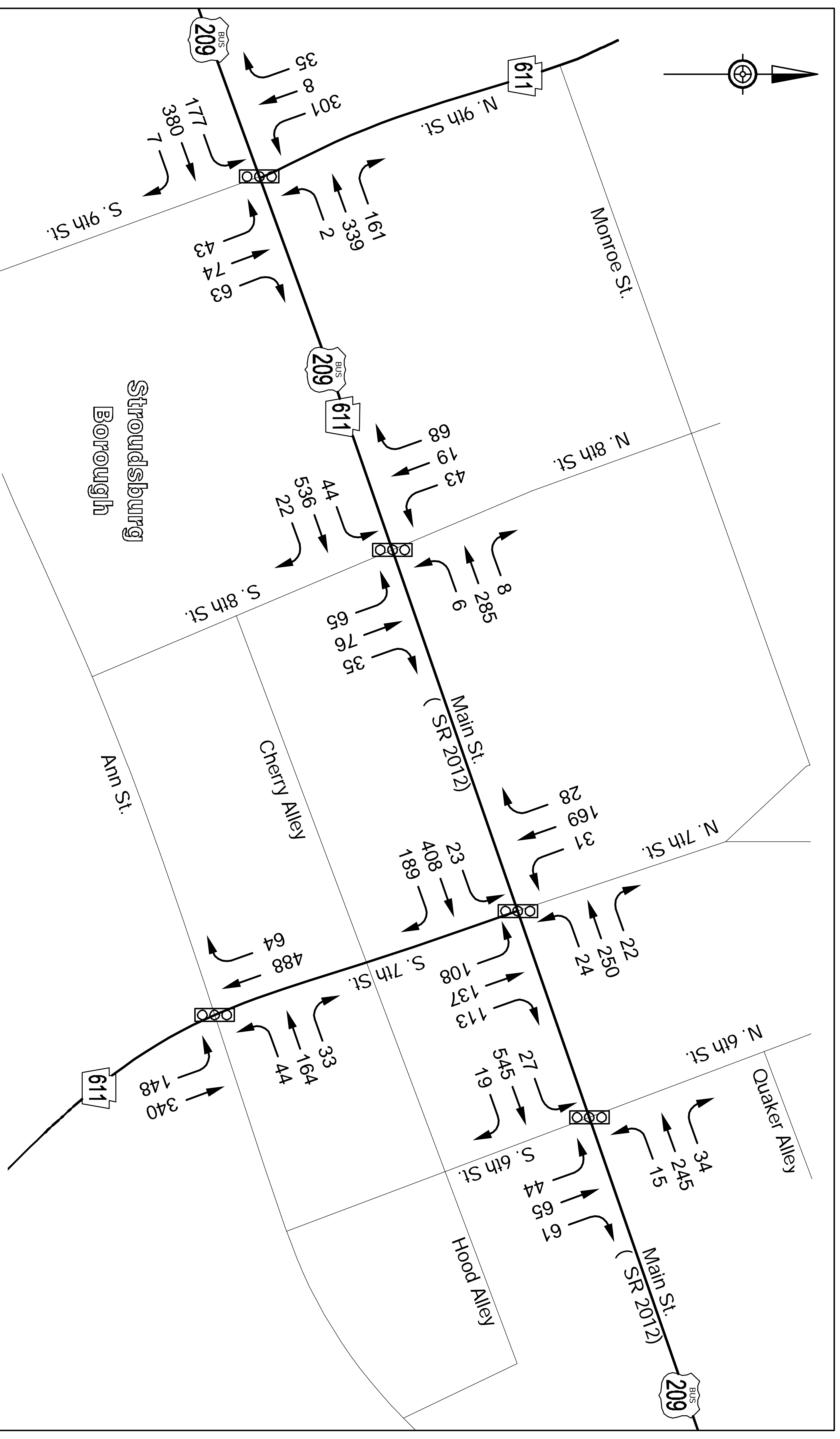
FIGURE 12
 NO-BUILD
 P.M. PEAK HOUR
 2045 TRAFFIC VOLUMES



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I-80 Reconstruction
 Monroe County

FIGURE 13
NO-BUILD
P.M. PEAK HOUR
2045 TRAFFIC VOLUMES



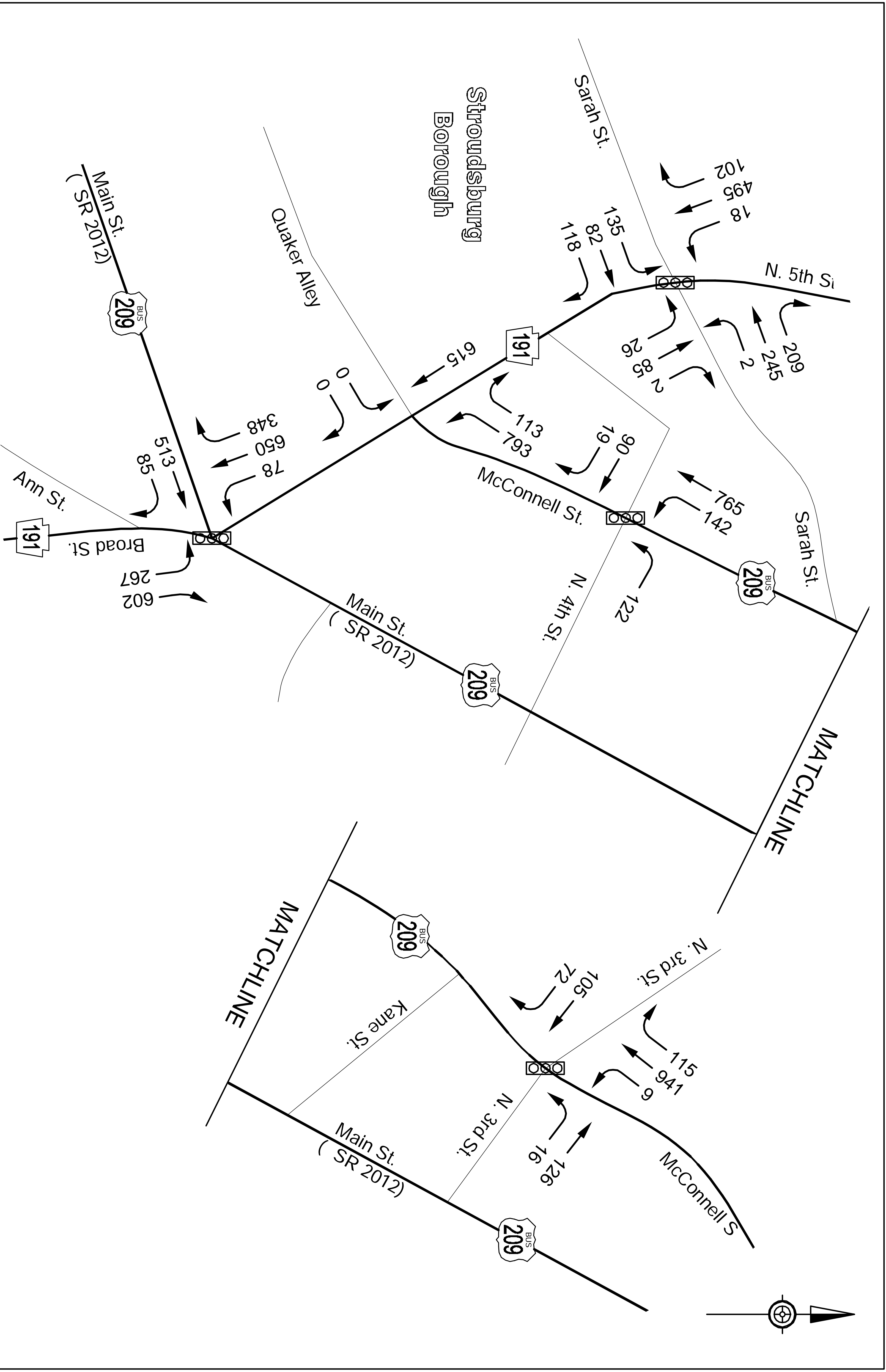
1700 Market Street - Suite 1600
Philadelphia, PA 19103

I-80 Reconstruction

Monroe County

FIGURE 14
NO-BUILD
P.M. PEAK HOUR
2045 TRAFFIC VOLUMES

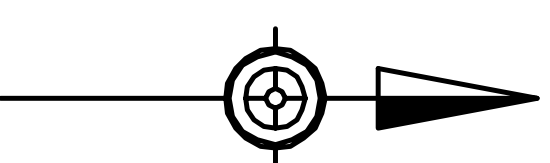
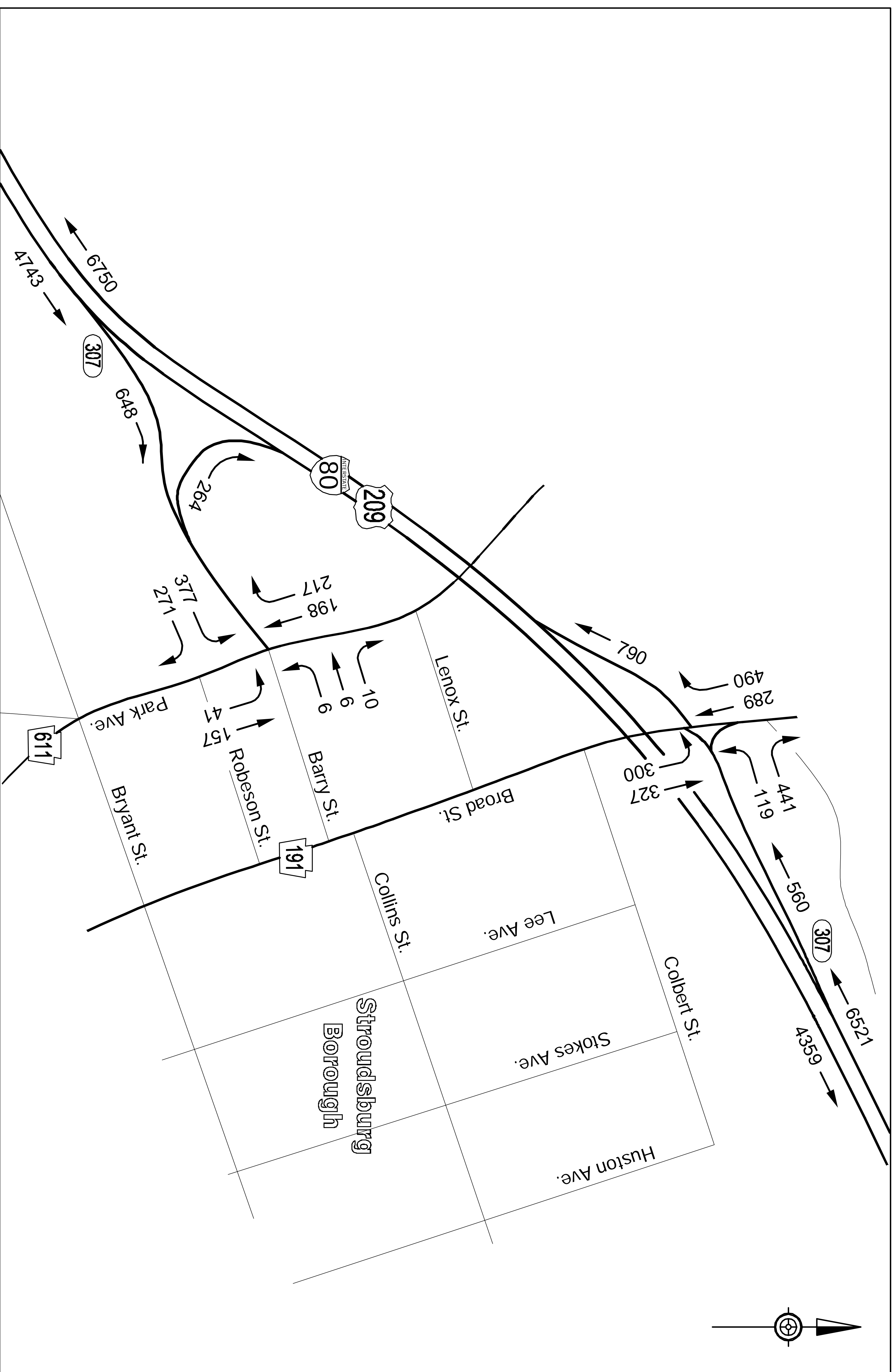
Stroudsburg
Borough



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I-80 Reconstruction
 Monroe County

FIGURE 15
NO-BUILD
P.M. PEAK HOUR
2045 TRAFFIC VOLUMES



1700 Market Street - Suite 1600
Philadelphia, PA 19103

I-80 Reconstruction

Monroe County

FIGURE 16
NO-BUILD
P.M. PEAK HOUR
2045 TRAFFIC VOLUMES

FREEWAY SEGMENT HCS ANALYSIS

BASIC FREEWAY SEGMENTS WORKSHEET					
General Information			Site Information		
Analyst	AJM		Highway/Direction of Travel	I-80 Eastbound	
Agency or Company	AECOM		From/To	Between Ints. 303 and 304	
Date Performed	7/22/2013		Jurisdiction		
Analysis Time Period	A.M. Peak Hour		Analysis Year	No Build 2045	
Project Description <i>Interstate 80 Reconstruction</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	2546	veh/h	Peak-Hour Factor, PHF	0.94	
AADT		veh/day	%Trucks and Buses, P _T	10	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.862	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0 mph	
Number of Lanes, N	2		f _{LC}	0.0 mph	
Total Ramp Density, TRD	1.67	ramps/mi	TRD Adjustment	5.0 mph	
FFS (measured)		mph	FFS	70.4 mph	
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	1654	pc/h/ln	Design LOS		
S	67.6	mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln	
D = v _p / S	24.5	pc/mi/ln	S	mph	
LOS	C		D = v _p / S	pc/mi/ln	
			Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

BASIC FREEWAY SEGMENTS WORKSHEET					
General Information			Site Information		
Analyst	AJM		Highway/Direction of Travel	I-80 Eastbound	
Agency or Company	AECOM		From/To	Between Ints. 303 and 304	
Date Performed	7/24/2013		Jurisdiction		
Analysis Time Period	P.M. Peak Hour		Analysis Year	No Build 2025	
Project Description <i>Interstate 80 Reconstruction</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	3211	veh/h	Peak-Hour Factor, PHF	0.94	
AADT		veh/day	%Trucks and Buses, P _T	12	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.840	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0 mph	
Number of Lanes, N	2		f _{LC}	0.0 mph	
Total Ramp Density, TRD	1.67	ramps/mi	TRD Adjustment	5.0 mph	
FFS (measured)		mph	FFS	70.4 mph	
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	2139	pc/h/ln	Design LOS		
S	59.8	mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln	
D = v _p / S	35.8	pc/mi/ln	S	mph	
LOS	E		D = v _p / S	pc/mi/ln	
			Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

BASIC FREEWAY SEGMENTS WORKSHEET					
General Information			Site Information		
Analyst	AJM		Highway/Direction of Travel	I-80 Eastbound	
Agency or Company	AECOM		From/To	Between Ints. 304 and 305	
Date Performed	7/24/2013		Jurisdiction		
Analysis Time Period	A.M. Peak Hour		Analysis Year	No Build 2045	
Project Description <i>Interstate 80 Reconstruction</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	4118	veh/h	Peak-Hour Factor, PHF	0.91	
AADT		veh/day	%Trucks and Buses, P _T	10	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.862	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0 mph	
Number of Lanes, N	2		f _{LC}	0.0 mph	
Total Ramp Density, TRD	1.67	ramps/mi	TRD Adjustment	5.0 mph	
FFS (measured)		mph	FFS	70.4 mph	
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	2763	pc/h/ln	Design LOS		
S	41.7	mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln	
D = v _p / S	66.3	pc/mi/ln	S	mph	
LOS	F		D = v _p / S	pc/mi/ln	
			Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

BASIC FREEWAY SEGMENTS WORKSHEET					
General Information			Site Information		
Analyst	AJM		Highway/Direction of Travel	I-80 Eastbound	
Agency or Company	AECOM		From/To	Between Ints. 304 and 305	
Date Performed	7/24/2013		Jurisdiction		
Analysis Time Period	P.M. Peak Hour		Analysis Year	No Build 2045	
Project Description <i>Interstate 80 Reconstruction</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	4656	veh/h	Peak-Hour Factor, PHF	0.95	
AADT		veh/day	%Trucks and Buses, P _T	12	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.840	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0 mph	
Number of Lanes, N	2		f _{LC}	0.0 mph	
Total Ramp Density, TRD	1.67	ramps/mi	TRD Adjustment	5.0 mph	
FFS (measured)		mph	FFS	70.4 mph	
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	3070	pc/h/ln	Design LOS		
S	29.4	mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln	
D = v _p / S	104.3	pc/mi/ln	S	mph	
LOS	F		D = v _p / S	pc/mi/ln	
			Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

BASIC FREEWAY SEGMENTS WORKSHEET					
General Information			Site Information		
Analyst	AJM		Highway/Direction of Travel	I-80 Eastbound	
Agency or Company	AECOM		From/To	Between Ints. 305 and 306	
Date Performed	7/24/2013		Jurisdiction		
Analysis Time Period	A.M. Peak Hour		Analysis Year	No Build 2045	
Project Description <i>Interstate 80 Reconstruction</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	4048	veh/h	Peak-Hour Factor, PHF	0.87	
AADT		veh/day	%Trucks and Buses, P _T	10	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.862	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0 mph	
Number of Lanes, N	2		f _{LC}	0.0 mph	
Total Ramp Density, TRD	1.50	ramps/mi	TRD Adjustment	4.5 mph	
FFS (measured)		mph	FFS	70.9 mph	
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	2841	pc/h/ln	Design LOS		
S	38.8	mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln	
D = v _p / S	73.3	pc/mi/ln	S	mph	
LOS	F		D = v _p / S	pc/mi/ln	
			Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

BASIC FREEWAY SEGMENTS WORKSHEET					
General Information			Site Information		
Analyst	AJM		Highway/Direction of Travel	I-80 Eastbound	
Agency or Company	AECOM		From/To	Between Ints. 305 and 306	
Date Performed	7/24/2013		Jurisdiction		
Analysis Time Period	P.M. Peak Hour		Analysis Year	No Build 2045	
Project Description <i>Interstate 80 Reconstruction</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	4555	veh/h	Peak-Hour Factor, PHF	0.96	
AADT		veh/day	%Trucks and Buses, P _T	12	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.840	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0 mph	
Number of Lanes, N	2		f _{LC}	0.0 mph	
Total Ramp Density, TRD	1.50	ramps/mi	TRD Adjustment	4.5 mph	
FFS (measured)		mph	FFS	70.9 mph	
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	2972	pc/h/ln	Design LOS		
S	33.6	mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln	
D = v _p / S	88.5	pc/mi/ln	S	mph	
LOS	F		D = v _p / S	pc/mi/ln	
			Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

BASIC FREEWAY SEGMENTS WORKSHEET					
General Information			Site Information		
Analyst	AJM		Highway/Direction of Travel	I-80 Eastbound	
Agency or Company	AECOM		From/To	Between Ints. 306 and 307	
Date Performed	7/24/2013		Jurisdiction		
Analysis Time Period	A.M. Peak Hour		Analysis Year	No Build 2045	
Project Description <i>Interstate 80 Reconstruction</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	4267	veh/h	Peak-Hour Factor, PHF	0.83	
AADT		veh/day	%Trucks and Buses, P _T	8	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.885	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0 mph	
Number of Lanes, N	2		f _{LC}	0.0 mph	
Total Ramp Density, TRD	1.83	ramps/mi	TRD Adjustment	5.3 mph	
FFS (measured)		mph	FFS	70.1 mph	
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	3058	pc/h/ln	Design LOS		
S	30.0	mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln	
D = v _p / S	102.1	pc/mi/ln	S	mph	
LOS	F		D = v _p / S	pc/mi/ln	
			Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

BASIC FREEWAY SEGMENTS WORKSHEET					
General Information			Site Information		
Analyst	AJM		Highway/Direction of Travel	I-80 Eastbound	
Agency or Company	AECOM		From/To	Between Ints. 306 and 307	
Date Performed	7/24/2013		Jurisdiction		
Analysis Time Period	P.M. Peak Hour		Analysis Year	No Build 2045	
Project Description <i>Interstate 80 Reconstruction</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	4743	veh/h	Peak-Hour Factor, PHF	0.97	
AADT		veh/day	%Trucks and Buses, P _T	10	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.862	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0 mph	
Number of Lanes, N	2		f _{LC}	0.0 mph	
Total Ramp Density, TRD	1.83	ramps/mi	TRD Adjustment	5.3 mph	
FFS (measured)		mph	FFS	70.1 mph	
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	2985	pc/h/ln	Design LOS		
S	33.0	mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln	
D = v _p / S	90.3	pc/mi/ln	S	mph	
LOS	F		D = v _p / S	pc/mi/ln	
			Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

BASIC FREEWAY SEGMENTS WORKSHEET					
General Information			Site Information		
Analyst	AJM		Highway/Direction of Travel	I-80 Westbound	
Agency or Company	AECOM		From/To	Between Ints. 303 and 304	
Date Performed	7/24/2013		Jurisdiction		
Analysis Time Period	A.M. Peak Hour		Analysis Year	No Build 2045	
Project Description <i>Interstate 80 Reconstruction</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	2126	veh/h	Peak-Hour Factor, PHF	0.97	
AADT		veh/day	%Trucks and Buses, P _T	12	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.840	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0 mph	
Number of Lanes, N	2		f _{LC}	0.0 mph	
Total Ramp Density, TRD	1.67	ramps/mi	TRD Adjustment	5.0 mph	
FFS (measured)		mph	FFS	70.4 mph	
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	1373	pc/h/ln	Design LOS		
S	69.7	mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln	
D = v _p / S	19.7	pc/mi/ln	S	mph	
LOS	C		D = v _p / S	pc/mi/ln	
			Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

BASIC FREEWAY SEGMENTS WORKSHEET					
General Information			Site Information		
Analyst	AJM		Highway/Direction of Travel	I-80 Westbound	
Agency or Company	AECOM		From/To	Between Ints. 303 and 304	
Date Performed	7/24/2013		Jurisdiction		
Analysis Time Period	P.M. Peak Hour		Analysis Year	No Build 2045	
Project Description <i>Interstate 80 Reconstruction</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	4468	veh/h	Peak-Hour Factor, PHF	0.97	
AADT		veh/day	%Trucks and Buses, P _T	13	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.830	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0 mph	
Number of Lanes, N	2		f _{LC}	0.0 mph	
Total Ramp Density, TRD	1.67	ramps/mi	TRD Adjustment	5.0 mph	
FFS (measured)		mph	FFS	70.4 mph	
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	2921	pc/h/ln	Design LOS		
S	35.6	mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln	
D = v _p / S	82.0	pc/mi/ln	S	mph	
LOS	F		D = v _p / S	pc/mi/ln	
			Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

BASIC FREEWAY SEGMENTS WORKSHEET					
General Information			Site Information		
Analyst	AJM		Highway/Direction of Travel	I-80 Westbound	
Agency or Company	AECOM		From/To	Between Ints. 304 and 305	
Date Performed	7/24/2013		Jurisdiction		
Analysis Time Period	A.M. Peak Hour		Analysis Year	No Build 2045	
Project Description <i>Interstate 80 Reconstruction</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	3149	veh/h	Peak-Hour Factor, PHF	0.95	
AADT		veh/day	%Trucks and Buses, P _T	12	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.840	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0 mph	
Number of Lanes, N	2		f _{LC}	0.0 mph	
Total Ramp Density, TRD	1.67	ramps/mi	TRD Adjustment	5.0 mph	
FFS (measured)		mph	FFS	70.4 mph	
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	2076	pc/h/ln	Design LOS		
S	61.1	mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln	
D = v _p / S	34.0	pc/mi/ln	S	mph	
LOS	D		D = v _p / S	pc/mi/ln	
			Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

BASIC FREEWAY SEGMENTS WORKSHEET					
General Information			Site Information		
Analyst	AJM		Highway/Direction of Travel	I-80 Westbound	
Agency or Company	AECOM		From/To	Between Ints. 304 and 305	
Date Performed	7/24/2013		Jurisdiction		
Analysis Time Period	P.M. Peak Hour		Analysis Year	No Build 2045	
Project Description <i>Interstate 80 Reconstruction</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	6470	veh/h	Peak-Hour Factor, PHF	0.97	
AADT		veh/day	%Trucks and Buses, P _T	13	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.830	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0 mph	
Number of Lanes, N	2		f _{LC}	0.0 mph	
Total Ramp Density, TRD	1.67	ramps/mi	TRD Adjustment	5.0 mph	
FFS (measured)		mph	FFS	70.4 mph	
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	4230	pc/h/ln	Design LOS		
S		mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln	
D = v _p / S		pc/mi/ln	S	mph	
LOS	F		D = v _p / S	pc/mi/ln	
			Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

BASIC FREEWAY SEGMENTS WORKSHEET					
General Information			Site Information		
Analyst	AJM		Highway/Direction of Travel	I-80 Westbound	
Agency or Company	AECOM		From/To	Between Ints. 305 and 306	
Date Performed	7/24/2013		Jurisdiction		
Analysis Time Period	A.M. Peak Hour		Analysis Year	No Build 2045	
Project Description <i>Interstate 80 Reconstruction</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	3106	veh/h	Peak-Hour Factor, PHF	0.93	
AADT		veh/day	%Trucks and Buses, P _T	12	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.840	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0 mph	
Number of Lanes, N	2		f _{LC}	0.0 mph	
Total Ramp Density, TRD	1.50	ramps/mi	TRD Adjustment	4.5 mph	
FFS (measured)		mph	FFS	70.9 mph	
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	2092	pc/h/ln	Design LOS		
S	60.8	mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln	
D = v _p / S	34.4	pc/mi/ln	S	mph	
LOS	D		D = v _p / S	pc/mi/ln	
			Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

BASIC FREEWAY SEGMENTS WORKSHEET					
General Information			Site Information		
Analyst	AJM		Highway/Direction of Travel	I-80 Westbound	
Agency or Company	AECOM		From/To	Between Ints. 305 and 306	
Date Performed	7/24/2013		Jurisdiction		
Analysis Time Period	P.M. Peak Hour		Analysis Year	No Build 2045	
Project Description <i>Interstate 80 Reconstruction</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	6447	veh/h	Peak-Hour Factor, PHF	0.96	
AADT		veh/day	%Trucks and Buses, P _T	13	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.830	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0 mph	
Number of Lanes, N	2		f _{LC}	0.0 mph	
Total Ramp Density, TRD	1.50	ramps/mi	TRD Adjustment	4.5 mph	
FFS (measured)		mph	FFS	70.9 mph	
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	4259	pc/h/ln	Design LOS		
S		mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln	
D = v _p / S		pc/mi/ln	S	mph	
LOS	F		D = v _p / S	pc/mi/ln	
			Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

BASIC FREEWAY SEGMENTS WORKSHEET					
General Information			Site Information		
Analyst	AJM		Highway/Direction of Travel	I-80 Westbound	
Agency or Company	AECOM		From/To	Between Ints. 306 and 307	
Date Performed	7/24/2013		Jurisdiction		
Analysis Time Period	A.M. Peak Hour		Analysis Year	No Build 2045	
Project Description <i>Interstate 80 Reconstruction</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	3240	veh/h	Peak-Hour Factor, PHF	0.91	
AADT		veh/day	%Trucks and Buses, P _T	12	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.840	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0 mph	
Number of Lanes, N	2		f _{LC}	0.0 mph	
Total Ramp Density, TRD	1.83	ramps/mi	TRD Adjustment	5.3 mph	
FFS (measured)		mph	FFS	70.1 mph	
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	2230	pc/h/ln	Design LOS		
S	57.7	mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln	
D = v _p / S	38.7	pc/mi/ln	S	mph	
LOS	E		D = v _p / S	pc/mi/ln	
			Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

BASIC FREEWAY SEGMENTS WORKSHEET					
General Information			Site Information		
Analyst	AJM		Highway/Direction of Travel	I-80 Westbound	
Agency or Company	AECOM		From/To	Between Ints. 306 and 307	
Date Performed	7/24/2013		Jurisdiction		
Analysis Time Period	P.M. Peak Hour		Analysis Year	No Build 2045	
Project Description <i>Interstate 80 Reconstruction</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	6750	veh/h	Peak-Hour Factor, PHF	0.96	
AADT		veh/day	%Trucks and Buses, P _T	12	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.840	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0 mph	
Number of Lanes, N	2		f _{LC}	0.0 mph	
Total Ramp Density, TRD	1.83	ramps/mi	TRD Adjustment	5.3 mph	
FFS (measured)		mph	FFS	70.1 mph	
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	4404	pc/h/ln	Design LOS		
S		mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln	
D = v _p / S		pc/mi/ln	S	mph	
LOS	F		D = v _p / S	pc/mi/ln	
			Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

RAMP JUNCTION HCS ANALYSIS

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	AJM				Freeway/Dir of Travel	I-80 Eastbound			
Agency or Company	AECOM				Junction	Int. 304 from Route 209			
Date Performed	7/24/2013				Jurisdiction				
Analysis Time Period	A.M. Peak Hour				Analysis Year	No Build 2045			
Project Description Interstate 80 Reconstruction									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h			Terrain: Rolling S _{FF} = 70.0 mph S _{FR} = 35.0 mph Sketch (show lanes, L _A , L _D , V _R , V _F)				Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off L _{down} = 1360 ft V _D = 394 veh/h		
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	2546	0.94	Rolling	10	1	0.862	0.95	3307	
Ramp	1572	0.94	Rolling	5	1	0.922	0.95	1910	
UpStream									
DownStream	394	0.82	Rolling	2	0	0.971	0.95	521	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3) L _{EQ} = P _{FM} = 1.000 using Equation (Exhibit 25-5) V ₁₂ = 3307 pc/h V ₃ or V _{av34} = 0 pc/h (Equation 25-4 or 25-5) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 25-8)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9) L _{EQ} = P _{FD} = using Equation (Exhibit 25-12) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 25-15 or 25-16) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 25-18)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	5217	Exhibit 25-7		Yes	V _F		Exhibit 25-14		
					V _{FO} = V _F - V _R		Exhibit 25-14		
					V _R		Exhibit 25-3		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	5217	Exhibit 25-7	4600:All	Yes	V ₁₂		Exhibit 25-14		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 40.3 (pc/mi/ln) LOS = F (Exhibit 25-4)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 25-4)				
Speed Determination					Speed Determination				
M _S =	0.984 (Exhibit 25-19)				D _S =	(Exhibit 25-19)			
S _R =	42.4 mph (Exhibit 25-19)				S _R =	mph (Exhibit 25-19)			
S ₀ =	N/A mph (Exhibit 25-19)				S ₀ =	mph (Exhibit 25-19)			
S =	42.4 mph (Exhibit 25-14)				S =	mph (Exhibit 25-15)			

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	AJM				Freeway/Dir of Travel	I-80 Eastbound			
Agency or Company	AECOM				Junction	Int. 304 from Route 209			
Date Performed	7/24/2013				Jurisdiction				
Analysis Time Period	P.M. Peak Hour				Analysis Year	No Build 2045			
Project Description Interstate 80 Reconstruction									
Inputs									
Upstream Adj Ramp			Terrain: Rolling				Downstream Adj Ramp		
<input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off							<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off		
L _{up} = ft			S _{FF} = 70.0 mph S _{FR} = 35.0 mph				L _{down} = 1360 ft		
V _u = veh/h			Sketch (show lanes, L _A , L _D , V _R , V _I)				V _D = 471 veh/h		
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	3211	0.94	Rolling	12	1	0.840	0.95	4279	
Ramp	1445	0.94	Rolling	2	1	0.962	0.95	1683	
UpStream									
DownStream	471	0.86	Rolling	3	0	0.957	0.95	602	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9)				
L _{EQ} =					L _{EQ} =				
P _{FM} = 1.000 using Equation (Exhibit 25-5)					P _{FD} = using Equation (Exhibit 25-12)				
V ₁₂ = 4279 pc/h					V ₁₂ = pc/h				
V ₃ or V _{av34} = 0 pc/h (Equation 25-4 or 25-5)					V ₃ or V _{av34} = pc/h (Equation 25-15 or 25-16)				
Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, V _{12a} = pc/h (Equation 25-8)					If Yes, V _{12a} = pc/h (Equation 25-18)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	5962	Exhibit 25-7		Yes	V _F		Exhibit 25-14		
					V _{FO} = V _F - V _R		Exhibit 25-14		
					V _R		Exhibit 25-3		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	5962	Exhibit 25-7	4600:All	Yes	V ₁₂		Exhibit 25-14		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$				
D _R = 46.2 (pc/mi/ln)					D _R = (pc/mi/ln)				
LOS = F (Exhibit 25-4)					LOS = (Exhibit 25-4)				
Speed Determination					Speed Determination				
M _S = 1.780 (Exhibit 25-19)					D _S = (Exhibit 25-19)				
S _R = 20.2 mph (Exhibit 25-19)					S _R = mph (Exhibit 25-19)				
S ₀ = N/A mph (Exhibit 25-19)					S ₀ = mph (Exhibit 25-19)				
S = 20.2 mph (Exhibit 25-14)					S = mph (Exhibit 25-15)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	AJM				Freeway/Dir of Travel	I-80 Eastbound			
Agency or Company	AECOM				Junction	Int. 305 from W. Main Street			
Date Performed	7/24/2013				Jurisdiction				
Analysis Time Period	A.M. Peak Hour				Analysis Year	No Build 2045			
Project Description Interstate 80 Reconstruction									
Inputs									
Upstream Adj Ramp			Terrain: Rolling				Downstream Adj Ramp		
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off							<input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off		
L _{up} = 800 ft			S _{FF} = 70.0 mph				S _{FR} = 35.0 mph		
V _u = 394 veh/h			Sketch (show lanes, L _A , L _D , V _R , V _F)				L _{down} = ft		
							V _D = veh/h		
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	3724	0.91	Rolling	10	1	0.862	0.95	4997	
Ramp	324	0.74	Rolling	0	0	1.000	0.95	461	
UpStream	394	0.82	Rolling	2	0	0.971	0.95	521	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9)				
L _{EQ} =					L _{EQ} =				
P _{FM} = 1.000 using Equation (Exhibit 25-5)					P _{FD} = using Equation (Exhibit 25-12)				
V ₁₂ = 4997 pc/h					V ₁₂ = pc/h				
V ₃ or V _{av34} = 0 pc/h (Equation 25-4 or 25-5)					V ₃ or V _{av34} = pc/h (Equation 25-15 or 25-16)				
Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, V _{12a} = pc/h (Equation 25-8)					If Yes, V _{12a} = pc/h (Equation 25-18)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	5458	Exhibit 25-7		Yes	V _F		Exhibit 25-14		
					V _{FO} = V _F - V _R		Exhibit 25-14		
					V _R		Exhibit 25-3		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	5458	Exhibit 25-7	4600:All	Yes	V ₁₂		Exhibit 25-14		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$				
D _R = 46.8 (pc/mi/ln)					D _R = (pc/mi/ln)				
LOS = F (Exhibit 25-4)					LOS = (Exhibit 25-4)				
Speed Determination					Speed Determination				
M _S = 1.224 (Exhibit 25-19)					D _S = (Exhibit 25-19)				
S _R = 35.7 mph (Exhibit 25-19)					S _R = mph (Exhibit 25-19)				
S ₀ = N/A mph (Exhibit 25-19)					S ₀ = mph (Exhibit 25-19)				
S = 35.7 mph (Exhibit 25-14)					S = mph (Exhibit 25-15)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	AJM				Freeway/Dir of Travel	I-80 Eastbound			
Agency or Company	AECOM				Junction	Int. 305 from W. Main Street			
Date Performed	7/24/2013				Jurisdiction				
Analysis Time Period	P.M. Peak Hour				Analysis Year	No Build 2045			
Project Description Interstate 80 Reconstruction									
Inputs									
Upstream Adj Ramp			Terrain: Rolling				Downstream Adj Ramp		
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off							<input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off		
L _{up} = 800 ft			S _{FF} = 70.0 mph				S _{FR} = 35.0 mph		
V _u = 471 veh/h			Sketch (show lanes, L _A , L _D , V _R , V _F)				L _{down} = ft		
							V _D = veh/h		
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	4186	0.95	Rolling	12	1	0.840	0.95	5519	
Ramp	369	0.96	Rolling	0	0	1.000	0.95	405	
UpStream	471	0.86	Rolling	3	0	0.957	0.95	602	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9)				
L _{EQ} =					L _{EQ} =				
P _{FM} = 1.000 using Equation (Exhibit 25-5)					P _{FD} = using Equation (Exhibit 25-12)				
V ₁₂ = 5519 pc/h					V ₁₂ = pc/h				
V ₃ or V _{av34} = 0 pc/h (Equation 25-4 or 25-5)					V ₃ or V _{av34} = pc/h (Equation 25-15 or 25-16)				
Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, V _{12a} = pc/h (Equation 25-8)					If Yes, V _{12a} = pc/h (Equation 25-18)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	5924	Exhibit 25-7		Yes	V _F		Exhibit 25-14		
					V _{FO} = V _F - V _R		Exhibit 25-14		
					V _R		Exhibit 25-3		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	5924	Exhibit 25-7		4600:All	Yes	V ₁₂		Exhibit 25-14	
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$				
D _R = 50.4 (pc/mi/ln)					D _R = (pc/mi/ln)				
LOS = F (Exhibit 25-4)					LOS = (Exhibit 25-4)				
Speed Determination					Speed Determination				
M _S = 1.767 (Exhibit 25-19)					D _S = (Exhibit 25-19)				
S _R = 20.5 mph (Exhibit 25-19)					S _R = mph (Exhibit 25-19)				
S ₀ = N/A mph (Exhibit 25-19)					S ₀ = mph (Exhibit 25-19)				
S = 20.5 mph (Exhibit 25-14)					S = mph (Exhibit 25-15)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	AJM				Freeway/Dir of Travel	I-80 Eastbound			
Agency or Company	AECOM				Junction	Int. 306 from Dreher Avenue			
Date Performed	7/24/2013				Jurisdiction				
Analysis Time Period	A.M. Peak Hour				Analysis Year	No Build 2045			
Project Description Interstate 80 Reconstruction									
Inputs									
Upstream Adj Ramp			Terrain: Rolling				Downstream Adj Ramp		
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off							<input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off		
L _{up} = 2100 ft			S _{FF} = 70.0 mph				L _{down} = ft		
V _u = 324 veh/h			S _{FR} = 35.0 mph				V _D = veh/h		
Sketch (show lanes, L _A , L _D , V _R , V _F)									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	4048	0.87	Rolling	10	1	0.862	0.95	5681	
Ramp	219	0.67	Rolling	1	0	0.985	0.95	349	
UpStream	324	0.74	Rolling	0	0	1.000	0.95	461	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9)				
L _{EQ} =					L _{EQ} =				
P _{FM} = 1.000 using Equation (Exhibit 25-5)					P _{FD} = using Equation (Exhibit 25-12)				
V ₁₂ = 5681 pc/h					V ₁₂ = pc/h				
V ₃ or V _{av34} = 0 pc/h (Equation 25-4 or 25-5)					V ₃ or V _{av34} = pc/h (Equation 25-15 or 25-16)				
Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, V _{12a} = pc/h (Equation 25-8)					If Yes, V _{12a} = pc/h (Equation 25-18)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	6030	Exhibit 25-7		Yes	V _F		Exhibit 25-14		
					V _{FO} = V _F - V _R		Exhibit 25-14		
					V _R		Exhibit 25-3		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	6030	Exhibit 25-7	4600:All	Yes	V ₁₂		Exhibit 25-14		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$				
D _R = 50.3 (pc/mi/ln)					D _R = (pc/mi/ln)				
LOS = F (Exhibit 25-4)					LOS = (Exhibit 25-4)				
Speed Determination					Speed Determination				
M _S = 1.920 (Exhibit 25-19)					D _S = (Exhibit 25-19)				
S _R = 16.2 mph (Exhibit 25-19)					S _R = mph (Exhibit 25-19)				
S ₀ = N/A mph (Exhibit 25-19)					S ₀ = mph (Exhibit 25-19)				
S = 16.2 mph (Exhibit 25-14)					S = mph (Exhibit 25-15)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	AJM				Freeway/Dir of Travel	I-80 Eastbound			
Agency or Company	AECOM				Junction	Int. 306 from Dreher Avenue			
Date Performed	7/24/2013				Jurisdiction				
Analysis Time Period	P.M. Peak Hour				Analysis Year	No Build 2045			
Project Description Interstate 80 Reconstruction									
Inputs									
Upstream Adj Ramp			Terrain: Rolling				Downstream Adj Ramp		
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off							<input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off		
L _{up} = 2100 ft			S _{FF} = 70.0 mph				S _{FR} = 35.0 mph		
V _u = 369 veh/h			Sketch (show lanes, L _A , L _D , V _R , V _F)				L _{down} = ft		
							V _D = veh/h		
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	4555	0.96	Rolling	12	1	0.840	0.95	5943	
Ramp	188	0.81	Rolling	1	0	0.985	0.95	248	
UpStream	369	0.96	Rolling	0	0	1.000	0.95	405	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9)				
L _{EQ} =					L _{EQ} =				
P _{FM} = 1.000 using Equation (Exhibit 25-5)					P _{FD} = using Equation (Exhibit 25-12)				
V ₁₂ = 5943 pc/h					V ₁₂ = pc/h				
V ₃ or V _{av34} = 0 pc/h (Equation 25-4 or 25-5)					V ₃ or V _{av34} = pc/h (Equation 25-15 or 25-16)				
Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, V _{12a} = pc/h (Equation 25-8)					If Yes, V _{12a} = pc/h (Equation 25-18)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	6191	Exhibit 25-7		Yes	V _F		Exhibit 25-14		
					V _{FO} = V _F - V _R		Exhibit 25-14		
					V _R		Exhibit 25-3		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	6191	Exhibit 25-7	4600:All	Yes	V ₁₂		Exhibit 25-14		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$				
D _R = 51.6 (pc/mi/ln)					D _R = (pc/mi/ln)				
LOS = F (Exhibit 25-4)					LOS = (Exhibit 25-4)				
Speed Determination					Speed Determination				
M _S = 2.203 (Exhibit 25-19)					D _S = (Exhibit 25-19)				
S _R = 8.3 mph (Exhibit 25-19)					S _R = mph (Exhibit 25-19)				
S ₀ = N/A mph (Exhibit 25-19)					S ₀ = mph (Exhibit 25-19)				
S = 8.3 mph (Exhibit 25-14)					S = mph (Exhibit 25-15)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	AJM				Freeway/Dir of Travel	I-80 Eastbound			
Agency or Company	AECOM				Junction	Int. 307 from Park Avenue			
Date Performed	7/24/2013				Jurisdiction				
Analysis Time Period	A.M. Peak Hour				Analysis Year	No Build 2045			
Project Description Interstate 80 Reconstruction									
Inputs									
Upstream Adj Ramp			Terrain: Rolling				Downstream Adj Ramp		
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off							<input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off		
L _{up} = 950 ft			S _{FF} = 70.0 mph				S _{FR} = 35.0 mph		
V _u = 718 veh/h			Sketch (show lanes, L _A , L _D , V _R , V _F)				L _{down} = ft		
							V _D = veh/h		
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	3549	0.83	Rolling	8	1	0.885	0.95	5086	
Ramp	219	0.85	Rolling	4	0	0.943	0.95	287	
UpStream	718	0.82	Rolling	6	0	0.917	0.95	1005	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9)				
L _{EQ} =					L _{EQ} =				
P _{FM} = 1.000 using Equation (Exhibit 25-5)					P _{FD} = using Equation (Exhibit 25-12)				
V ₁₂ = 5086 pc/h					V ₁₂ = pc/h				
V ₃ or V _{av34} = 0 pc/h (Equation 25-4 or 25-5)					V ₃ or V _{av34} = pc/h (Equation 25-15 or 25-16)				
Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, V _{12a} = pc/h (Equation 25-8)					If Yes, V _{12a} = pc/h (Equation 25-18)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	5373	Exhibit 25-7		Yes	V _F		Exhibit 25-14		
					V _{FO} = V _F - V _R		Exhibit 25-14		
					V _R		Exhibit 25-3		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	5373	Exhibit 25-7	4600:All	Yes	V ₁₂		Exhibit 25-14		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A					D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D				
D _R = 45.7 (pc/mi/ln)					D _R = (pc/mi/ln)				
LOS = F (Exhibit 25-4)					LOS = (Exhibit 25-4)				
Speed Determination					Speed Determination				
M _S = 1.145 (Exhibit 25-19)					D _S = (Exhibit 25-19)				
S _R = 37.9 mph (Exhibit 25-19)					S _R = mph (Exhibit 25-19)				
S ₀ = N/A mph (Exhibit 25-19)					S ₀ = mph (Exhibit 25-19)				
S = 37.9 mph (Exhibit 25-14)					S = mph (Exhibit 25-15)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	AJM		Freeway/Dir of Travel	I-80 Eastbound					
Agency or Company	AECOM		Junction	Int. 307 from Park Avenue					
Date Performed	7/24/2013		Jurisdiction						
Analysis Time Period	P.M. Peak Hour		Analysis Year	No Build 2045					
Project Description Interstate 80 Reconstruction									
Inputs									
Upstream Adj Ramp			Terrain: Rolling				Downstream Adj Ramp		
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off							<input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off		
L _{up} = 950 ft			S _{FF} = 70.0 mph				S _{FR} = 35.0 mph		
V _u = 648 veh/h			Sketch (show lanes, L _A , L _D , V _R , V _F)				L _{down} = ft		
							V _D = veh/h		
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	4095	0.97	Rolling	10	1	0.862	0.95	5155	
Ramp	264	0.63	Rolling	1	0	0.985	0.95	448	
UpStream	648	0.84	Rolling	2	0	0.971	0.95	836	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9)				
L _{EQ} =					L _{EQ} =				
P _{FM} = 1.000 using Equation (Exhibit 25-5)					P _{FD} = using Equation (Exhibit 25-12)				
V ₁₂ = 5155 pc/h					V ₁₂ = pc/h				
V ₃ or V _{av34} = 0 pc/h (Equation 25-4 or 25-5)					V ₃ or V _{av34} = pc/h (Equation 25-15 or 25-16)				
Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, V _{12a} = pc/h (Equation 25-8)					If Yes, V _{12a} = pc/h (Equation 25-18)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	5603	Exhibit 25-7		Yes	V _F		Exhibit 25-14		
					V _{FO} = V _F - V _R		Exhibit 25-14		
					V _R		Exhibit 25-3		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	5603	Exhibit 25-7	4600:All	Yes	V ₁₂		Exhibit 25-14		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$				
D _R = 47.5 (pc/mi/ln)					D _R = (pc/mi/ln)				
LOS = F (Exhibit 25-4)					LOS = (Exhibit 25-4)				
Speed Determination					Speed Determination				
M _S = 1.362 (Exhibit 25-19)					D _S = (Exhibit 25-19)				
S _R = 31.9 mph (Exhibit 25-19)					S _R = mph (Exhibit 25-19)				
S ₀ = N/A mph (Exhibit 25-19)					S ₀ = mph (Exhibit 25-19)				
S = 31.9 mph (Exhibit 25-14)					S = mph (Exhibit 25-15)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	AJM				Freeway/Dir of Travel	I-80 Westbound			
Agency or Company	AECOM				Junction	Int. 303 from Route 611			
Date Performed	7/24/2013				Jurisdiction				
Analysis Time Period	A.M. Peak Hour				Analysis Year	No Build 2045			
Project Description Interstate 80 Reconstruction									
Inputs									
Upstream Adj Ramp			Terrain: Rolling				Downstream Adj Ramp		
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off							<input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off		
L _{up} = 4630 ft			S _{FF} = 70.0 mph S _{FR} = 35.0 mph				L _{down} = ft		
V _u = 1023 veh/h			Sketch (show lanes, L _A , L _D , V _R , V _p)				V _D = veh/h		
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	2126	0.97	Rolling	12	1	0.840	0.95	2745	
Ramp	173	0.74	Rolling	2	0	0.971	0.95	253	
UpStream	1023	0.94	Rolling	8	1	0.885	0.95	1295	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9)				
L _{EQ} =					L _{EQ} =				
P _{FM} = 1.000 using Equation (Exhibit 25-5)					P _{FD} = using Equation (Exhibit 25-12)				
V ₁₂ = 2745 pc/h					V ₁₂ = pc/h				
V ₃ or V _{av34} = 0 pc/h (Equation 25-4 or 25-5)					V ₃ or V _{av34} = pc/h (Equation 25-15 or 25-16)				
Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, V _{12a} = pc/h (Equation 25-8)					If Yes, V _{12a} = pc/h (Equation 25-18)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	2998	Exhibit 25-7		No	V _F		Exhibit 25-14		
					V _{FO} = V _F - V _R		Exhibit 25-14		
					V _R		Exhibit 25-3		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	2998	Exhibit 25-7	4600:All	No	V ₁₂		Exhibit 25-14		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$				
D _R = 22.0 (pc/mi/ln)					D _R = (pc/mi/ln)				
LOS = C (Exhibit 25-4)					LOS = (Exhibit 25-4)				
Speed Determination					Speed Determination				
M _S = 0.324 (Exhibit 25-19)					D _S = (Exhibit 25-19)				
S _R = 60.9 mph (Exhibit 25-19)					S _R = mph (Exhibit 25-19)				
S ₀ = N/A mph (Exhibit 25-19)					S ₀ = mph (Exhibit 25-19)				
S = 60.9 mph (Exhibit 25-14)					S = mph (Exhibit 25-15)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	AJM				Freeway/Dir of Travel	I-80 Westbound			
Agency or Company	AECOM				Junction	Int. 303 from Route 611			
Date Performed	7/24/2013				Jurisdiction				
Analysis Time Period	P.M. Peak Hour				Analysis Year	No Build 2045			
Project Description Interstate 80 Reconstruction									
Inputs									
Upstream Adj Ramp			Terrain: Rolling				Downstream Adj Ramp		
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off							<input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off		
L _{up} = 4630 ft			S _{FF} = 70.0 mph				S _{FR} = 35.0 mph		
V _u = 2001 veh/h			Sketch (show lanes, L _A , L _D , V _R , V _p)				L _{down} = ft		
							V _D = veh/h		
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	4468	0.97	Rolling	13	1	0.830	0.95	5843	
Ramp	322	0.87	Rolling	1	0	0.985	0.95	395	
UpStream	2001	0.94	Rolling	2	1	0.962	0.95	2330	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9)				
L _{EQ} =					L _{EQ} =				
P _{FM} = 1.000 using Equation (Exhibit 25-5)					P _{FD} = using Equation (Exhibit 25-12)				
V ₁₂ = 5843 pc/h					V ₁₂ = pc/h				
V ₃ or V _{av34} = 0 pc/h (Equation 25-4 or 25-5)					V ₃ or V _{av34} = pc/h (Equation 25-15 or 25-16)				
Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, V _{12a} = pc/h (Equation 25-8)					If Yes, V _{12a} = pc/h (Equation 25-18)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	6238	Exhibit 25-7		Yes	V _F		Exhibit 25-14		
					V _{FO} = V _F - V _R		Exhibit 25-14		
					V _R		Exhibit 25-3		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	6238	Exhibit 25-7	4600:All	Yes	V ₁₂		Exhibit 25-14		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$				
D _R = 47.2 (pc/mi/ln)					D _R = (pc/mi/ln)				
LOS = F (Exhibit 25-4)					LOS = (Exhibit 25-4)				
Speed Determination					Speed Determination				
M _S = 2.242 (Exhibit 25-19)					D _S = (Exhibit 25-19)				
S _R = 7.2 mph (Exhibit 25-19)					S _R = mph (Exhibit 25-19)				
S ₀ = N/A mph (Exhibit 25-19)					S ₀ = mph (Exhibit 25-19)				
S = 7.2 mph (Exhibit 25-14)					S = mph (Exhibit 25-15)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	AJM				Freeway/Dir of Travel	I-80 Westbound			
Agency or Company	AECOM				Junction	Int. 307 from Broad Street			
Date Performed	7/24/2013				Jurisdiction				
Analysis Time Period	A.M. Peak Hour				Analysis Year	No Build 2045			
Project Description Interstate 80 Reconstruction									
Inputs									
Upstream Adj Ramp			Terrain: Rolling				Downstream Adj Ramp		
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off							<input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off		
L _{up} = 1600 ft			S _{FF} = 70.0 mph				S _{FR} = 35.0 mph		
V _u = 360 veh/h			Sketch (show lanes, L _A , L _D , V _R , V _F)				L _{down} = ft		
							V _D = veh/h		
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	2766	0.91	Rolling	12	1	0.840	0.95	3807	
Ramp	473	0.91	Rolling	6	0	0.917	0.95	596	
UpStream	360	0.90	Rolling	3	0	0.957	0.95	440	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9)				
L _{EQ} =					L _{EQ} =				
P _{FM} = 1.000 using Equation (Exhibit 25-5)					P _{FD} = using Equation (Exhibit 25-12)				
V ₁₂ = 3807 pc/h					V ₁₂ = pc/h				
V ₃ or V _{av34} = 0 pc/h (Equation 25-4 or 25-5)					V ₃ or V _{av34} = pc/h (Equation 25-15 or 25-16)				
Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, V _{12a} = pc/h (Equation 25-8)					If Yes, V _{12a} = pc/h (Equation 25-18)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	4403	Exhibit 25-7		No	V _F		Exhibit 25-14		
					V _{FO} = V _F - V _R		Exhibit 25-14		
					V _R		Exhibit 25-3		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	4403	Exhibit 25-7	4600:All	No	V ₁₂		Exhibit 25-14		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$				
D _R = 38.4 (pc/mi/ln)					D _R = (pc/mi/ln)				
LOS = E (Exhibit 25-4)					LOS = (Exhibit 25-4)				
Speed Determination					Speed Determination				
M _S = 0.627 (Exhibit 25-19)					D _S = (Exhibit 25-19)				
S _R = 52.4 mph (Exhibit 25-19)					S _R = mph (Exhibit 25-19)				
S ₀ = N/A mph (Exhibit 25-19)					S ₀ = mph (Exhibit 25-19)				
S = 52.4 mph (Exhibit 25-14)					S = mph (Exhibit 25-15)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	AJM				Freeway/Dir of Travel	I-80 Westbound			
Agency or Company	AECOM				Junction	Int. 307 from Broad Street			
Date Performed	7/24/2013				Jurisdiction				
Analysis Time Period	P.M. Peak Hour				Analysis Year	No Build 2045			
Project Description Interstate 80 Reconstruction									
Inputs									
Upstream Adj Ramp			Terrain: Rolling				Downstream Adj Ramp		
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off							<input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off		
L _{up} = 1600 ft			S _{FF} = 70.0 mph				S _{FR} = 35.0 mph		
V _u = 560 veh/h			Sketch (show lanes, L _A , L _D , V _R , V _F)				L _{down} = ft		
							V _D = veh/h		
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5961	0.96	Rolling	12	1	0.840	0.95	7778	
Ramp	790	0.89	Rolling	1	0	0.985	0.95	948	
UpStream	560	0.88	Rolling	1	0	0.985	0.95	680	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9)				
L _{EQ} =					L _{EQ} =				
P _{FM} = 1.000 using Equation (Exhibit 25-5)					P _{FD} = using Equation (Exhibit 25-12)				
V ₁₂ = 7778 pc/h					V ₁₂ = pc/h				
V ₃ or V _{av34} = 0 pc/h (Equation 25-4 or 25-5)					V ₃ or V _{av34} = pc/h (Equation 25-15 or 25-16)				
Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, V _{12a} = pc/h (Equation 25-8)					If Yes, V _{12a} = pc/h (Equation 25-18)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	8726	Exhibit 25-7		Yes	V _F		Exhibit 25-14		
					V _{FO} = V _F - V _R		Exhibit 25-14		
					V _R		Exhibit 25-3		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	8726	Exhibit 25-7	4600:All	Yes	V ₁₂		Exhibit 25-14		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A					D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D				
D _R = 72.0 (pc/mi/ln)					D _R = (pc/mi/ln)				
LOS = F (Exhibit 25-4)					LOS = (Exhibit 25-4)				
Speed Determination					Speed Determination				
M _S = 24.336 (Exhibit 25-19)					D _S = (Exhibit 25-19)				
S _R = -611.4 mph (Exhibit 25-19)					S _R = mph (Exhibit 25-19)				
S ₀ = N/A mph (Exhibit 25-19)					S ₀ = mph (Exhibit 25-19)				
S = -611.4 mph (Exhibit 25-14)					S = mph (Exhibit 25-15)				

RAMPS AND RAMP JUNCTIONS WORKSHEET													
General Information					Site Information								
Analyst	AJM				Freeway/Dir of Travel	I-80 Eastbound							
Agency or Company	AECOM				Junction	Int. 303 to Route 611							
Date Performed	7/24/2013				Jurisdiction								
Analysis Time Period	A.M. Peak Hour				Analysis Year	No Build 2045							
Project Description Interstate 80 Reconstruction													
Inputs													
Upstream Adj Ramp			Terrain: Rolling				Downstream Adj Ramp						
<input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off							<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off						
L _{up} = ft			S _{FF} = 70.0 mph S _{FR} = 35.0 mph				L _{down} = 5500 ft						
V _u = veh/h			Sketch (show lanes, L _A , L _D , V _R , V _F)				V _D = 1572 veh/h						
Conversion to pc/h Under Base Conditions													
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p					
Freeway	2857	0.94	Rolling	10	1	0.862	0.95	3711					
Ramp	311	0.72	Rolling	1	0	0.985	0.95	461					
UpStream													
DownStream	1572	0.94	Rolling	5	1	0.922	0.95	1910					
Merge Areas					Diverge Areas								
Estimation of v ₁₂					Estimation of v ₁₂								
$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3) L _{EQ} = using Equation (Exhibit 25-5) P _{FM} = using Equation (Exhibit 25-5) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 25-4 or 25-5) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 25-8)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9) L _{EQ} = using Equation (Exhibit 25-12) P _{FD} = 1.000 using Equation (Exhibit 25-12) V ₁₂ = 3711 pc/h V ₃ or V _{av34} 0 pc/h (Equation 25-15 or 25-16) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 25-18)								
Capacity Checks					Capacity Checks								
		Actual	Capacity				Actual	Capacity		LOS F?			
V _{FO}			Exhibit 25-7		V _F		3711	Exhibit 25-14		4800	No		
					V _{FO} = V _F - V _R		3250	Exhibit 25-14		4800	No		
					V _R		461	Exhibit 25-3		2000	No		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area								
		Actual	Max Desirable		Violation?				Actual	Max Desirable		Violation?	
V _{R12}			Exhibit 25-7				V ₁₂		3711	Exhibit 25-14		4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)								
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 25-4)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 29.9 (pc/mi/ln) LOS = D (Exhibit 25-4)								
Speed Determination					Speed Determination								
M _S = (Exhibit 25-19) S _R = mph (Exhibit 25-19) S ₀ = mph (Exhibit 25-19) S = mph (Exhibit 25-14)					D _S = 0.469 (Exhibit 25-19) S _R = 56.9 mph (Exhibit 25-19) S ₀ = N/A mph (Exhibit 25-19) S = 56.9 mph (Exhibit 25-15)								

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		AJM			Freeway/Dir of Travel		I-80 Eastbound		
Agency or Company		AECOM			Junction		Int. 303 to Route 611		
Date Performed		7/24/2013			Jurisdiction				
Analysis Time Period		P.M. Peak Hour			Analysis Year		No Build 2045		
Project Description Interstate 80 Reconstruction									
Inputs									
Upstream Adj Ramp		Terrain: Rolling					Downstream Adj Ramp		
<input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off							<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off		
L _{up} = ft		S _{FF} = 70.0 mph S _{FR} = 35.0 mph					L _{down} = 5500 ft		
V _u = veh/h		Sketch (show lanes, L _A , L _D , V _R , V _F)					V _D = 1445 veh/h		
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	3622	0.94	Rolling	12	1	0.840	0.95	4827	
Ramp	411	0.97	Rolling	1	0	0.985	0.95	453	
UpStream									
DownStream	1445	0.94	Rolling	2	1	0.962	0.95	1683	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9)				
L _{EQ} =					L _{EQ} =				
P _{FM} = using Equation (Exhibit 25-5)					P _{FD} = 1.000 using Equation (Exhibit 25-12)				
V ₁₂ = pc/h					V ₁₂ = 4827 pc/h				
V ₃ or V _{av34} pc/h (Equation 25-4 or 25-5)					V ₃ or V _{av34} 0 pc/h (Equation 25-15 or 25-16)				
Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No					Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No					Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
If Yes, V _{12a} = pc/h (Equation 25-8)					If Yes, V _{12a} = pc/h (Equation 25-18)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 25-7			V _F	4827	Exhibit 25-14	4800	Yes
					V _{FO} = V _F - V _R	4374	Exhibit 25-14	4800	No
					V _R	453	Exhibit 25-3	2000	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 25-7			V ₁₂	4827	Exhibit 25-14 4400:All		Yes
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A					D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D				
D _R = (pc/mi/ln)					D _R = 39.5 (pc/mi/ln)				
LOS = (Exhibit 25-4)					LOS = F (Exhibit 25-4)				
Speed Determination					Speed Determination				
M _S = (Exhibit 25-19)					D _S = 0.469 (Exhibit 25-19)				
S _R = mph (Exhibit 25-19)					S _R = 56.9 mph (Exhibit 25-19)				
S ₀ = mph (Exhibit 25-19)					S ₀ = N/A mph (Exhibit 25-19)				
S = mph (Exhibit 25-14)					S = 56.9 mph (Exhibit 25-15)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	AJM				Freeway/Dir of Travel	I-80 Eastbound			
Agency or Company	AECOM				Junction	Int. 305 to W. Main Street			
Date Performed	7/24/2013				Jurisdiction				
Analysis Time Period	A.M. Peak Hour				Analysis Year	No Build 2045			
Project Description Interstate 80 Reconstruction									
Inputs									
Upstream Adj Ramp			Terrain: Rolling				Downstream Adj Ramp		
<input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off							<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off		
L _{up} = ft			S _{FF} = 70.0 mph S _{FR} = 35.0 mph				L _{down} = 700 ft		
V _u = veh/h			Sketch (show lanes, L _A , L _D , V _R , V _F)				V _D = 324 veh/h		
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	4118	0.91	Rolling	10	1	0.862	0.95	5526	
Ramp	394	0.82	Rolling	2	0	0.971	0.95	521	
UpStream									
DownStream	324	0.74	Rolling	0	0	1.000	0.95	461	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3) L _{EQ} = using Equation (Exhibit 25-5) P _{FM} = using Equation (Exhibit 25-5) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 25-4 or 25-5) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 25-8)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9) L _{EQ} = using Equation (Exhibit 25-12) P _{FD} = 1.000 using Equation (Exhibit 25-12) V ₁₂ = 5526 pc/h V ₃ or V _{av34} 0 pc/h (Equation 25-15 or 25-16) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 25-18)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 25-7			V _F	5526	Exhibit 25-14	4800	Yes
					V _{FO} = V _F - V _R	5005	Exhibit 25-14	4800	Yes
					V _R	521	Exhibit 25-3	2000	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 25-7			V ₁₂	5526	Exhibit 25-14		4400:All
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 25-4)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 50.3 (pc/mi/ln) LOS = F (Exhibit 25-4)				
Speed Determination					Speed Determination				
M _S = (Exhibit 25-19) S _R = mph (Exhibit 25-19) S ₀ = mph (Exhibit 25-19) S = mph (Exhibit 25-14)					D _S = 0.475 (Exhibit 25-19) S _R = 56.7 mph (Exhibit 25-19) S ₀ = N/A mph (Exhibit 25-19) S = 56.7 mph (Exhibit 25-15)				

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	AJM				Freeway/Dir of Travel	I-80 Eastbound				
Agency or Company	AECOM				Junction	Int. 305 to W. Main Street				
Date Performed	7/24/2013				Jurisdiction					
Analysis Time Period	P.M. Peak Hour				Analysis Year	No Build 2045				
Project Description Interstate 80 Reconstruction										
Inputs										
Upstream Adj Ramp			Terrain: Rolling				Downstream Adj Ramp			
<input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off							<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off			
L _{up} = ft			S _{FF} = 70.0 mph S _{FR} = 35.0 mph				L _{down} = 700 ft			
V _u = veh/h			Sketch (show lanes, L _A , L _D , V _R , V _F)				V _D = 369 veh/h			
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	4657	0.95	Rolling	12	1	0.840	0.95	6141		
Ramp	471	0.86	Rolling	3	0	0.957	0.95	602		
UpStream										
DownStream	369	0.96	Rolling	0	0	1.000	0.95	405		
Merge Areas					Diverge Areas					
Estimation of v ₁₂					Estimation of v ₁₂					
$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9)					
L _{EQ} = using Equation (Exhibit 25-5)					L _{EQ} = 1.000 using Equation (Exhibit 25-12)					
P _{FM} = pc/h					P _{FD} = 6141 pc/h					
V ₁₂ = pc/h (Equation 25-4 or 25-5)					V ₁₂ = 0 pc/h (Equation 25-15 or 25-16)					
Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No					Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No					Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
If Yes, V _{12a} = pc/h (Equation 25-8)					If Yes, V _{12a} = pc/h (Equation 25-18)					
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 25-7			V _F	6141	Exhibit 25-14	4800	Yes	
					V _{FO} = V _F - V _R	5539	Exhibit 25-14	4800	Yes	
					V _R	602	Exhibit 25-3	2000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?	
V _{R12}		Exhibit 25-7			V ₁₂	6141	Exhibit 25-14		4400:All	Yes
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A					D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D					
D _R = (pc/mi/ln)					D _R = 55.6 (pc/mi/ln)					
LOS = (Exhibit 25-4)					LOS = F (Exhibit 25-4)					
Speed Determination					Speed Determination					
M _S = (Exhibit 25-19)					D _S = 0.482 (Exhibit 25-19)					
S _R = mph (Exhibit 25-19)					S _R = 56.5 mph (Exhibit 25-19)					
S ₀ = mph (Exhibit 25-19)					S ₀ = N/A mph (Exhibit 25-19)					
S = mph (Exhibit 25-14)					S = 56.5 mph (Exhibit 25-15)					

RAMPS AND RAMP JUNCTIONS WORKSHEET												
General Information					Site Information							
Analyst	AJM				Freeway/Dir of Travel	I-80 Eastbound						
Agency or Company	AECOM				Junction	Int. 307 to Park Avenue						
Date Performed	7/24/2013				Jurisdiction							
Analysis Time Period	A.M. Peak Hour				Analysis Year	No Build 2045						
Project Description Interstate 80 Reconstruction												
Inputs												
Upstream Adj Ramp			Terrain: Rolling				Downstream Adj Ramp					
<input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off							<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off					
L _{up} = ft			S _{FF} = 70.0 mph S _{FR} = 35.0 mph				L _{down} = 810 ft					
V _u = veh/h			Sketch (show lanes, L _A , L _D , V _R , V _F)				V _D = 219 veh/h					
Conversion to pc/h Under Base Conditions												
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p				
Freeway	4267	0.83	Rolling	8	1	0.885	0.95	6115				
Ramp	718	0.82	Rolling	6	0	0.917	0.95	1005				
UpStream												
DownStream	219	0.85	Rolling	4	0	0.943	0.95	287				
Merge Areas					Diverge Areas							
Estimation of v ₁₂					Estimation of v ₁₂							
$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3) L _{EQ} = using Equation (Exhibit 25-5) P _{FM} = using Equation (Exhibit 25-5) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 25-4 or 25-5) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 25-8)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9) L _{EQ} = using Equation (Exhibit 25-12) P _{FD} = 1.000 using Equation (Exhibit 25-12) V ₁₂ = 6115 pc/h V ₃ or V _{av34} 0 pc/h (Equation 25-15 or 25-16) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 25-18)							
Capacity Checks					Capacity Checks							
		Actual	Capacity		LOS F?			Actual	Capacity		LOS F?	
V _{FO}			Exhibit 25-7			V _F	6115	Exhibit 25-14	4800	Yes		
						V _{FO} = V _F - V _R	5110	Exhibit 25-14	4800	Yes		
						V _R	1005	Exhibit 25-3	2000	No		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area							
		Actual	Max Desirable		Violation?			Actual	Max Desirable		Violation?	
V _{R12}			Exhibit 25-7			V ₁₂		6115	Exhibit 25-14		4400:All	Yes
Level of Service Determination (if not F)					Level of Service Determination (if not F)							
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 25-4)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 55.5 (pc/mi/ln) LOS = F (Exhibit 25-4)							
Speed Determination					Speed Determination							
M _S = (Exhibit 25-19) S _R = mph (Exhibit 25-19) S ₀ = mph (Exhibit 25-19) S = mph (Exhibit 25-14)					D _S = 0.518 (Exhibit 25-19) S _R = 55.5 mph (Exhibit 25-19) S ₀ = N/A mph (Exhibit 25-19) S = 55.5 mph (Exhibit 25-15)							

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst		AJM			Freeway/Dir of Travel		I-80 Eastbound			
Agency or Company		AECOM			Junction		Int. 307 to Park Avenue			
Date Performed		7/24/2013			Jurisdiction					
Analysis Time Period		P.M. Peak Hour			Analysis Year		No Build 2045			
Project Description Interstate 80 Reconstruction										
Inputs										
Upstream Adj Ramp		Terrain: Rolling					Downstream Adj Ramp			
<input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off							<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off			
L _{up} = ft		S _{FF} = 70.0 mph S _{FR} = 35.0 mph					L _{down} = 810 ft			
V _u = veh/h		Sketch (show lanes, L _A , L _D , V _R , V _F)					V _D = 264 veh/h			
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	4743	0.97	Rolling	10	1	0.862	0.95	5971		
Ramp	648	0.84	Rolling	2	0	0.971	0.95	836		
UpStream										
DownStream	264	0.63	Rolling	1	0	0.985	0.95	448		
Merge Areas					Diverge Areas					
Estimation of v ₁₂					Estimation of v ₁₂					
$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9)					
L _{EQ} = using Equation (Exhibit 25-5)					L _{EQ} = using Equation (Exhibit 25-12)					
P _{FM} = pc/h					P _{FD} = 5971 pc/h					
V ₁₂ = pc/h (Equation 25-4 or 25-5)					V ₁₂ = 0 pc/h (Equation 25-15 or 25-16)					
Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No					Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No					Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
If Yes, V _{12a} = pc/h (Equation 25-8)					If Yes, V _{12a} = pc/h (Equation 25-18)					
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 25-7			V _F	5971	Exhibit 25-14	4800	Yes	
					V _{FO} = V _F - V _R	5135	Exhibit 25-14	4800	Yes	
					V _R	836	Exhibit 25-3	2000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?	
V _{R12}		Exhibit 25-7			V ₁₂	5971	Exhibit 25-14		4400:All	Yes
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A					D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D					
D _R = (pc/mi/ln)					D _R = 54.3 (pc/mi/ln)					
LOS = (Exhibit 25-4)					LOS = F (Exhibit 25-4)					
Speed Determination					Speed Determination					
M _S = (Exhibit 25-19)					D _S = 0.503 (Exhibit 25-19)					
S _R = mph (Exhibit 25-19)					S _R = 55.9 mph (Exhibit 25-19)					
S ₀ = mph (Exhibit 25-19)					S ₀ = N/A mph (Exhibit 25-19)					
S = mph (Exhibit 25-14)					S = 55.9 mph (Exhibit 25-15)					

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	AJM				Freeway/Dir of Travel	I-80 Westbound				
Agency or Company	AECOM				Junction	Int. 305 to W. Main Street				
Date Performed	7/24/2013				Jurisdiction					
Analysis Time Period	A.M. Peak Hour				Analysis Year	No Build 2045				
Project Description Interstate 80 Reconstruction										
Inputs										
Upstream Adj Ramp			Terrain: Rolling				Downstream Adj Ramp			
<input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off							<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off			
L _{up} = ft			S _{FF} = 70.0 mph S _{FR} = 35.0 mph				L _{down} = 740 ft			
V _u = veh/h			Sketch (show lanes, L _A , L _D , V _R , V _F)				V _D = 328 veh/h			
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	3106	0.93	Rolling	12	1	0.840	0.95	4184		
Ramp	285	0.84	Rolling	1	0	0.985	0.95	363		
UpStream										
DownStream	328	0.87	Rolling	2	0	0.971	0.95	409		
Merge Areas					Diverge Areas					
Estimation of v ₁₂					Estimation of v ₁₂					
$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9)					
L _{EQ} =					L _{EQ} =					
P _{FM} = using Equation (Exhibit 25-5)					P _{FD} = 1.000 using Equation (Exhibit 25-12)					
V ₁₂ = pc/h					V ₁₂ = 4184 pc/h					
V ₃ or V _{av34} pc/h (Equation 25-4 or 25-5)					V ₃ or V _{av34} 0 pc/h (Equation 25-15 or 25-16)					
Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No					Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No					Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
If Yes, V _{12a} = pc/h (Equation 25-8)					If Yes, V _{12a} = pc/h (Equation 25-18)					
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 25-7			V _F	4184	Exhibit 25-14	4800	No	
					V _{FO} = V _F - V _R	3821	Exhibit 25-14	4800	No	
					V _R	363	Exhibit 25-3	2000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?	
V _{R12}		Exhibit 25-7			V ₁₂	4184	Exhibit 25-14		4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A					D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D					
D _R = (pc/mi/ln)					D _R = 39.2 (pc/mi/ln)					
LOS = (Exhibit 25-4)					LOS = E (Exhibit 25-4)					
Speed Determination					Speed Determination					
M _S = (Exhibit 25-19)					D _S = 0.461 (Exhibit 25-19)					
S _R = mph (Exhibit 25-19)					S _R = 57.1 mph (Exhibit 25-19)					
S ₀ = mph (Exhibit 25-19)					S ₀ = N/A mph (Exhibit 25-19)					
S = mph (Exhibit 25-14)					S = 57.1 mph (Exhibit 25-15)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		AJM			Freeway/Dir of Travel		I-80 Westbound		
Agency or Company		AECOM			Junction		Int. 305 to W. Main Street		
Date Performed		7/24/2013			Jurisdiction				
Analysis Time Period		P.M. Peak Hour			Analysis Year		No Build 2045		
Project Description Interstate 80 Reconstruction									
Inputs									
Upstream Adj Ramp		Terrain: Rolling					Downstream Adj Ramp		
<input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off							<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off		
L _{up} = ft		S _{FF} = 70.0 mph S _{FR} = 35.0 mph					L _{down} = 740 ft		
V _u = veh/h		Sketch (show lanes, L _A , L _D , V _R , V _F)					V _D = 603 veh/h		
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6447	0.96	Rolling	13	1	0.830	0.95	8518	
Ramp	580	0.90	Rolling	1	0	0.985	0.95	689	
UpStream									
DownStream	603	0.78	Rolling	1	0	0.985	0.95	826	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9)				
L _{EQ} =					L _{EQ} =				
P _{FM} = using Equation (Exhibit 25-5)					P _{FD} = 1.000 using Equation (Exhibit 25-12)				
V ₁₂ = pc/h					V ₁₂ = 8518 pc/h				
V ₃ or V _{av34} pc/h (Equation 25-4 or 25-5)					V ₃ or V _{av34} 0 pc/h (Equation 25-15 or 25-16)				
Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No					Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No					Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
If Yes, V _{12a} = pc/h (Equation 25-8)					If Yes, V _{12a} = pc/h (Equation 25-18)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 25-7			V _F	8518	Exhibit 25-14	4800	Yes
					V _{FO} = V _F - V _R	7829	Exhibit 25-14	4800	Yes
					V _R	689	Exhibit 25-3	2000	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 25-7			V ₁₂	8518	Exhibit 25-14 4400:All		Yes
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A					D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D				
D _R = (pc/mi/ln)					D _R = 76.4 (pc/mi/ln)				
LOS = (Exhibit 25-4)					LOS = F (Exhibit 25-4)				
Speed Determination					Speed Determination				
M _S = (Exhibit 25-19)					D _S = 0.490 (Exhibit 25-19)				
S _R = mph (Exhibit 25-19)					S _R = 56.3 mph (Exhibit 25-19)				
S ₀ = mph (Exhibit 25-19)					S ₀ = N/A mph (Exhibit 25-19)				
S = mph (Exhibit 25-14)					S = 56.3 mph (Exhibit 25-15)				

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	AJM				Freeway/Dir of Travel	I-80 Westbound				
Agency or Company	AECOM				Junction	Int. 306 to Dreher Avenue				
Date Performed	7/24/2013				Jurisdiction					
Analysis Time Period	A.M. Peak Hour				Analysis Year	No Build 2045				
Project Description Interstate 80 Reconstruction										
Inputs										
Upstream Adj Ramp			Terrain: Rolling				Downstream Adj Ramp			
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off							<input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off			
L _{up} = 3680 ft			S _{FF} = 70.0 mph				L _{down} = ft			
V _u = 473 veh/h			S _{FR} = 35.0 mph				V _D = veh/h			
Sketch (show lanes, L _A , L _D , V _R , V _T)										
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	3240	0.91	Rolling	12	1	0.840	0.95	4460		
Ramp	134	0.66	Rolling	3	0	0.957	0.95	223		
UpStream	473	0.91	Rolling	6	0	0.917	0.95	596		
DownStream										
Merge Areas					Diverge Areas					
Estimation of v ₁₂					Estimation of v ₁₂					
$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3) L _{EQ} = P _{FM} = using Equation (Exhibit 25-5) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 25-4 or 25-5) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 25-8)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9) L _{EQ} = P _{FD} = 1.000 using Equation (Exhibit 25-12) V ₁₂ = 4460 pc/h V ₃ or V _{av34} 0 pc/h (Equation 25-15 or 25-16) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 25-18)					
Capacity Checks					Capacity Checks					
		Actual	Capacity		LOS F?			Actual	Capacity	LOS F?
V _{FO}			Exhibit 25-7			V _F	4460	Exhibit 25-14	4800	No
						V _{FO} = V _F - V _R	4237	Exhibit 25-14	4800	No
						V _R	223	Exhibit 25-3	2000	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
		Actual	Max Desirable		Violation?			Actual	Max Desirable	Violation?
V _{R12}			Exhibit 25-7			V ₁₂	4460	Exhibit 25-14	4400:All	Yes
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 25-4)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 41.3 (pc/mi/ln) LOS = E (Exhibit 25-4)					
Speed Determination					Speed Determination					
M _S = (Exhibit 25-19) S _R = mph (Exhibit 25-19) S ₀ = mph (Exhibit 25-19) S = mph (Exhibit 25-14)					D _S = 0.448 (Exhibit 25-19) S _R = 57.5 mph (Exhibit 25-19) S ₀ = N/A mph (Exhibit 25-19) S = 57.5 mph (Exhibit 25-15)					

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	AJM				Freeway/Dir of Travel	I-80 Westbound				
Agency or Company	AECOM				Junction	Int. 306 to Dreher Avenue				
Date Performed	7/24/2013				Jurisdiction					
Analysis Time Period	P.M. Peak Hour				Analysis Year	No Build 2045				
Project Description Interstate 80 Reconstruction										
Inputs										
Upstream Adj Ramp			Terrain: Rolling				Downstream Adj Ramp			
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off							<input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off			
L _{up} = 3680 ft			S _{FF} = 70.0 mph				L _{down} = ft			
V _u = 790 veh/h			S _{FR} = 35.0 mph				V _D = veh/h			
Sketch (show lanes, L _A , L _D , V _R , V _T)										
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	6750	0.96	Rolling	12	1	0.840	0.95	8808		
Ramp	303	0.82	Rolling	3	0	0.957	0.95	406		
UpStream	790	0.89	Rolling	1	0	0.985	0.95	948		
DownStream										
Merge Areas					Diverge Areas					
Estimation of v ₁₂					Estimation of v ₁₂					
$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3) L _{EQ} = P _{FM} = using Equation (Exhibit 25-5) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 25-4 or 25-5) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 25-8)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9) L _{EQ} = P _{FD} = 1.000 using Equation (Exhibit 25-12) V ₁₂ = 8808 pc/h V ₃ or V _{av34} 0 pc/h (Equation 25-15 or 25-16) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 25-18)					
Capacity Checks					Capacity Checks					
		Actual	Capacity		LOS F?			Actual	Capacity	LOS F?
V _{FO}			Exhibit 25-7			V _F	8808	Exhibit 25-14	4800	Yes
						V _{FO} = V _F - V _R	8402	Exhibit 25-14	4800	Yes
						V _R	406	Exhibit 25-3	2000	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
		Actual	Max Desirable		Violation?			Actual	Max Desirable	Violation?
V _{R12}			Exhibit 25-7			V ₁₂	8808	Exhibit 25-14	4400:All	Yes
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 25-4)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 78.7 (pc/mi/ln) LOS = F (Exhibit 25-4)					
Speed Determination					Speed Determination					
M _S = (Exhibit 25-19) S _R = mph (Exhibit 25-19) S ₀ = mph (Exhibit 25-19) S = mph (Exhibit 25-14)					D _S = 0.465 (Exhibit 25-19) S _R = 57.0 mph (Exhibit 25-19) S ₀ = N/A mph (Exhibit 25-19) S = 57.0 mph (Exhibit 25-15)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	AJM				Freeway/Dir of Travel	I-80 Westbound			
Agency or Company	AECOM				Junction	Int. 307 to Broad Street			
Date Performed	7/24/2013				Jurisdiction				
Analysis Time Period	A.M. Peak Hour				Analysis Year	No Build 2045			
Project Description Interstate 80 Reconstruction									
Inputs									
Upstream Adj Ramp			Terrain: Rolling				Downstream Adj Ramp		
<input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off							<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off		
L _{up} = ft			S _{FF} = 70.0 mph S _{FR} = 35.0 mph				L _{down} = 1470 ft		
V _u = veh/h			Sketch (show lanes, L _A , L _D , V _R , V _F)				V _D = 473 veh/h		
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	3126	0.91	Rolling	12	1	0.840	0.95	4303	
Ramp	360	0.90	Rolling	3	0	0.957	0.95	440	
UpStream									
DownStream	473	0.91	Rolling	6	0	0.917	0.95	596	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9)				
L _{EQ} = using Equation (Exhibit 25-5)					L _{EQ} = 1.000 using Equation (Exhibit 25-12)				
P _{FM} = pc/h					P _{FD} = 4303 pc/h				
V ₁₂ = pc/h (Equation 25-4 or 25-5)					V ₁₂ = 0 pc/h (Equation 25-15 or 25-16)				
Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No					Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No					Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
If Yes, V _{12a} = pc/h (Equation 25-8)					If Yes, V _{12a} = pc/h (Equation 25-18)				
Capacity Checks					Capacity Checks				
		Actual	Capacity				Actual	Capacity	
V _{FO}			Exhibit 25-7		V _F		4303	Exhibit 25-14 4800	
					V _{FO} = V _F - V _R		3863	Exhibit 25-14 4800	
					V _R		440	Exhibit 25-3 2000	
LOS F?					LOS F?				
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
		Actual	Max Desirable				Actual	Max Desirable	
V _{R12}			Exhibit 25-7		V ₁₂		4303	Exhibit 25-14 4400:All	
Violation?					Violation?				
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$				
D _R = (pc/mi/ln)					D _R = 39.9 (pc/mi/ln)				
LOS = (Exhibit 25-4)					LOS = E (Exhibit 25-4)				
Speed Determination					Speed Determination				
M _S = (Exhibit 25-19)					D _S = 0.468 (Exhibit 25-19)				
S _R = mph (Exhibit 25-19)					S _R = 56.9 mph (Exhibit 25-19)				
S ₀ = mph (Exhibit 25-19)					S ₀ = N/A mph (Exhibit 25-19)				
S = mph (Exhibit 25-14)					S = 56.9 mph (Exhibit 25-15)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		AJM			Freeway/Dir of Travel		I-80 Westbound		
Agency or Company		AECOM			Junction		Int. 307 to Broad Street		
Date Performed		7/24/2013			Jurisdiction				
Analysis Time Period		P.M. Peak Hour			Analysis Year		No Build 2045		
Project Description Interstate 80 Reconstruction									
Inputs									
Upstream Adj Ramp		Terrain: Rolling					Downstream Adj Ramp		
<input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off							<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off		
L _{up} = ft		S _{FF} = 70.0 mph S _{FR} = 35.0 mph					L _{down} = 1470 ft		
V _u = veh/h		Sketch (show lanes, L _A , L _D , V _R , V _F)					V _D = 790 veh/h		
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6521	0.96	Rolling	12	1	0.840	0.95	8509	
Ramp	560	0.88	Rolling	1	0	0.985	0.95	680	
UpStream									
DownStream	790	0.89	Rolling	1	0	0.985	0.95	948	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9)				
L _{EQ} =					L _{EQ} =				
P _{FM} = using Equation (Exhibit 25-5)					P _{FD} = 1.000 using Equation (Exhibit 25-12)				
V ₁₂ = pc/h					V ₁₂ = 8509 pc/h				
V ₃ or V _{av34} pc/h (Equation 25-4 or 25-5)					V ₃ or V _{av34} 0 pc/h (Equation 25-15 or 25-16)				
Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No					Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No					Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
If Yes, V _{12a} = pc/h (Equation 25-8)					If Yes, V _{12a} = pc/h (Equation 25-18)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 25-7			V _F	8509	Exhibit 25-14	4800	Yes
					V _{FO} = V _F - V _R	7829	Exhibit 25-14	4800	Yes
					V _R	680	Exhibit 25-3	2000	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 25-7			V ₁₂	8509	Exhibit 25-14 4400:All		Yes
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A					D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D				
D _R = (pc/mi/ln)					D _R = 76.1 (pc/mi/ln)				
LOS = (Exhibit 25-4)					LOS = F (Exhibit 25-4)				
Speed Determination					Speed Determination				
M _S = (Exhibit 25-19)					D _S = 0.489 (Exhibit 25-19)				
S _R = mph (Exhibit 25-19)					S _R = 56.3 mph (Exhibit 25-19)				
S ₀ = mph (Exhibit 25-19)					S ₀ = N/A mph (Exhibit 25-19)				
S = mph (Exhibit 25-14)					S = 56.3 mph (Exhibit 25-15)				

WEAVE HCS ANALYSIS

Interstate 80 Reconstruction

FREEWAY WEAVING WORKSHEET									
General Information					Site Information				
Analyst	JRE				Freeway/Dir of Travel	I-80 Westbound			
Agency/Company	AECOM				Weaving Segment Location	Int. 305 to 304			
Date Performed	7/24/2013				Analysis Year	No Build 2045			
Analysis Time Period	A.M. Peak Hour								
Project Description <i>Interstate 80 Reconstruction</i>									
Inputs									
Weaving configuration	One-Sided				Segment type	Freeway			
Weaving number of lanes, N	3				Freeway minimum speed, S _{MIN}	15			
Weaving segment length, L _s	565ft				Freeway maximum capacity, C _{IFL}	2400			
Freeway free-flow speed, FFS	70 mph				Terrain type	Rolling			
Conversions to pc/h Under Base Conditions									
	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	f _p	v (pc/h)
V _{FF}	1930	0.95	12	1	2.5	2.0	0.840	0.95	2545
V _{RF}	196	0.87	2	0	2.5	2.0	0.971	0.95	244
V _{FR}	891	0.94	8	1	2.5	2.0	0.885	0.95	1127
V _{RR}	132	0.87	2	0	2.5	2.0	0.971	0.95	165
V _{NW}	2710							V =	4081
V _W	1371								
VR	0.336								
Configuration Characteristics									
Minimum maneuver lanes, N _{WL}	2 lc				Minimum weaving lane changes, LC _{MIN}	1371 lc/h			
Interchange density, ID	1.7 int/mi				Weaving lane changes, LC _W	1497 lc/h			
Minimum RF lane changes, LC _{RF}	1 lc/pc				Non-weaving lane changes, LC _{NW}	287 lc/h			
Minimum FR lane changes, LC _{FR}	1 lc/pc				Total lane changes, LC _{ALL}	1784 lc/h			
Minimum RR lane changes, LC _{RR}	lc/pc				Non-weaving vehicle index, I _{NW}	260			
Weaving Segment Speed, Density, Level of Service, and Capacity									
Weaving segment flow rate, v	4081 pc/h				Weaving intensity factor, W	0.560			
Weaving segment capacity, c _w	4756 veh/h				Weaving segment speed, S	52.4 mph			
Weaving segment v/c ratio	0.685				Average weaving speed, S _w	50.3 mph			
Weaving segment density, D	25.9 pc/mi/ln				Average non-weaving speed, S _{NW}	53.6 mph			
Level of Service, LOS	C				Maximum weaving length, L _{MAX}	5973 ft			
Notes									
a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".									
b. For volumes that exceed the weaving segment capacity, the level of service is "F".									

Interstate 80 Reconstruction

FREEWAY WEAVING WORKSHEET									
General Information					Site Information				
Analyst	JRE				Freeway/Dir of Travel	I-80 Westbound			
Agency/Company	AECOM				Weaving Segment Location	Int. 305 to 304			
Date Performed	7/24/2013				Analysis Year	No Build 2045			
Analysis Time Period	P.M. Peak Hour								
Project Description <i>Interstate 80 Reconstruction</i>									
Inputs									
Weaving configuration	One-Sided				Segment type	Freeway			
Weaving number of lanes, N	3				Freeway minimum speed, S _{MIN}	15			
Weaving segment length, L _s	565ft				Freeway maximum capacity, C _{IFL}	2400			
Freeway free-flow speed, FFS	70 mph				Terrain type	Rolling			
Conversions to pc/h Under Base Conditions									
	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	f _p	v (pc/h)
V _{FF}	4108	0.97	13	1	2.5	2.0	0.830	0.95	5372
V _{RF}	360	0.78	1	0	2.5	2.0	0.985	0.95	493
V _{FR}	1758	0.94	2	1	2.5	2.0	0.962	0.95	2047
V _{RR}	243	0.78	1	0	2.5	2.0	0.985	0.95	333
V _{NW}	5705							V =	8245
V _W	2540								
VR	0.308								
Configuration Characteristics									
Minimum maneuver lanes, N _{WL}	2 lc				Minimum weaving lane changes, LC _{MIN}	lc/h			
Interchange density, ID	1.7 int/mi				Weaving lane changes, LC _W	lc/h			
Minimum RF lane changes, LC _{RF}	1 lc/pc				Non-weaving lane changes, LC _{NW}	lc/h			
Minimum FR lane changes, LC _{FR}	1 lc/pc				Total lane changes, LC _{ALL}	lc/h			
Minimum RR lane changes, LC _{RR}	lc/pc				Non-weaving vehicle index, I _{NW}	369			
Weaving Segment Speed, Density, Level of Service, and Capacity									
Weaving segment flow rate, v	8245 pc/h				Weaving intensity factor, W				
Weaving segment capacity, c _w	4752 veh/h				Weaving segment speed, S	mph			
Weaving segment v/c ratio	1.368				Average weaving speed, S _w	mph			
Weaving segment density, D	pc/mi/ln				Average non-weaving speed, S _{NW}	mph			
Level of Service, LOS	F				Maximum weaving length, L _{MAX}	5671 ft			
Notes									
a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".									
b. For volumes that exceed the weaving segment capacity, the level of service is "F".									

UNSIGNALIZED INTERSECTION HCS ANALYSIS

TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	AJM			Intersection	SR 611 & I-80 EB Off Ramp			
Agency/Co.	AECOM			Jurisdiction				
Date Performed	8/2/2013			Analysis Year	No Build 2045			
Analysis Time Period	A.M. Peak Hour							
Project Description Interstate 80 Reconstruction								
East/West Street: SR 611 (N. 9th Street)				North/South Street: I-80 EB Off Ramp				
Intersection Orientation: East-West				Study Period (hrs): 0.25				
Vehicle Volumes and Adjustments								
Major Street	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)		857			923			
Peak-Hour Factor, PHF	1.00	0.88	1.00	1.00	0.87	1.00		
Hourly Flow Rate, HFR (veh/h)	0	973	0	0	1060	0		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	Two Way Left Turn Lane							
RT Channelized			0				0	
Lanes	0	1	0	0	1	0		
Configuration		T			T			
Upstream Signal		0			0			
Minor Street	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)			298					
Peak-Hour Factor, PHF	1.00	1.00	0.72	1.00	1.00	1.00		
Hourly Flow Rate, HFR (veh/h)	0	0	413	0	0	0		
Percent Heavy Vehicles	0	0	1	0	0	0		
Percent Grade (%)		0			0			
Flared Approach		N			N			
Storage		0			0			
RT Channelized			1				0	
Lanes	0	0	1	0	0	0		
Configuration			R					
Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration					R			
v (veh/h)					413			
C (m) (veh/h)					320			
v/c					1.29			
95% queue length					19.55			
Control Delay (s/veh)					185.6			
LOS					F			
Approach Delay (s/veh)	--	--	185.6					
Approach LOS	--	--	F					

TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	AJM			Intersection	SR 611 & I-80 EB Off Ramp			
Agency/Co.	AECOM			Jurisdiction				
Date Performed	8/2/2013			Analysis Year	No Build 2045			
Analysis Time Period	P.M. Peak Hour							
Project Description Interstate 80 Reconstruction								
East/West Street: SR 611 (N. 9th Street)				North/South Street: I-80 EB Off Ramp				
Intersection Orientation: East-West				Study Period (hrs): 0.25				
Vehicle Volumes and Adjustments								
Major Street	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)		1176			1417			
Peak-Hour Factor, PHF	1.00	0.92	1.00	1.00	0.96	1.00		
Hourly Flow Rate, HFR (veh/h)	0	1278	0	0	1476	0		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	Two Way Left Turn Lane							
RT Channelized			0				0	
Lanes	0	1	0	0	1	0		
Configuration		T			T			
Upstream Signal		0			0			
Minor Street	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)			407					
Peak-Hour Factor, PHF	1.00	1.00	0.98	1.00	1.00	1.00		
Hourly Flow Rate, HFR (veh/h)	0	0	415	0	0	0		
Percent Heavy Vehicles	0	0	1	0	0	0		
Percent Grade (%)		0			0			
Flared Approach		N			N			
Storage		0			0			
RT Channelized			1				0	
Lanes	0	0	1	0	0	0		
Configuration			R					
Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration					R			
v (veh/h)					415			
C (m) (veh/h)					211			
v/c					1.97			
95% queue length					30.59			
Control Delay (s/veh)					489.4			
LOS					F			
Approach Delay (s/veh)	--	--	489.4					
Approach LOS	--	--	F					

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	AJM			Intersection	SR 611 & Shopping Ctr Side Rd		
Agency/Co.	AECOM			Jurisdiction			
Date Performed	8/2/2013			Analysis Year	No Build 2045		
Analysis Time Period	A.M. Peak Hour						
Project Description <i>Interstate 80 Reconstruction</i>							
East/West Street: <i>SR 611 (N. 9th Street)</i>				North/South Street: <i>Shopping Center Side Road</i>			
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Eastbound			Westbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)	11	835			914	23	
Peak-Hour Factor, PHF	0.38	0.86	1.00	1.00	0.88	0.60	
Hourly Flow Rate, HFR (veh/h)	28	970	0	0	1038	38	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Two Way Left Turn Lane						
RT Channelized			0				0
Lanes	1	1	0	0	1		0
Configuration	L	T					TR
Upstream Signal		0			0		
Minor Street	Northbound			Southbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)				23		9	
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.60	1.00	0.63	
Hourly Flow Rate, HFR (veh/h)	0	0	0	38	0	14	
Percent Heavy Vehicles	0	0	0	0	0	0	
Percent Grade (%)		0			-2		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	0	0	0	0	0	
Configuration					LR		
Delay, Queue Length, and Level of Service							
Approach	Eastbound	Westbound	Northbound			Southbound	
Movement	1	4	7	8	9	10	11
Lane Configuration	L						LR
v (veh/h)	28						52
C (m) (veh/h)	503						239
v/c	0.06						0.22
95% queue length	0.18						0.81
Control Delay (s/veh)	12.6						24.2
LOS	B						C
Approach Delay (s/veh)	--	--					24.2
Approach LOS	--	--					C

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	AJM			Intersection	SR 611 & Shopping Ctr Side Rd		
Agency/Co.	AECOM			Jurisdiction			
Date Performed	8/2/2013			Analysis Year	No Build 2045		
Analysis Time Period	P.M. Peak Hour						
Project Description <i>Interstate 80 Reconstruction</i>							
East/West Street: <i>SR 611 (N. 9th Street)</i>				North/South Street: <i>Shopping Center Side Road</i>			
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Eastbound			Westbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)	28	1150			1359	62	
Peak-Hour Factor, PHF	0.54	0.91	1.00	1.00	0.96	0.69	
Hourly Flow Rate, HFR (veh/h)	51	1263	0	0	1415	89	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Two Way Left Turn Lane						
RT Channelized			0				0
Lanes	1	1	0	0	1		0
Configuration	L	T					TR
Upstream Signal		0			0		
Minor Street	Northbound			Southbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)				26		19	
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.70	1.00	0.50	
Hourly Flow Rate, HFR (veh/h)	0	0	0	37	0	38	
Percent Heavy Vehicles	0	0	0	0	0	0	
Percent Grade (%)		0			-2		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	0	0	0	0	0	
Configuration					LR		
Delay, Queue Length, and Level of Service							
Approach	Eastbound	Westbound	Northbound			Southbound	
Movement	1	4	7	8	9	10	11
Lane Configuration	L						LR
v (veh/h)	51						75
C (m) (veh/h)	348						152
v/c	0.15						0.49
95% queue length	0.51						2.35
Control Delay (s/veh)	17.1						49.8
LOS	C						E
Approach Delay (s/veh)	--	--					49.8
Approach LOS	--	--					E

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	AJM			Intersection	W. Main Street & I-80 EB Ramps		
Agency/Co.	AECOM			Jurisdiction			
Date Performed	8/2/2013			Analysis Year	No Build 2045		
Analysis Time Period	A.M. Peak Hour						
Project Description <i>Interstate 80 Reconstruction</i>							
East/West Street: <i>W. Main Street (SR 2012)</i>				North/South Street: <i>I-80 EB Ramps</i>			
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Eastbound			Westbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		479	288	36	697		
Peak-Hour Factor, PHF	1.00	0.95	0.81	0.43	0.91	1.00	
Hourly Flow Rate, HFR (veh/h)	0	504	355	83	765	0	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	1	0	1		0
Configuration		T	R	LT			
Upstream Signal		0			0		
Minor Street	Northbound			Southbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)	51		343				
Peak-Hour Factor, PHF	0.75	1.00	0.77	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	68	0	445	0	0	0	
Percent Heavy Vehicles	4	0	2	0	0	0	
Percent Grade (%)		-1			0		
Flared Approach		Y			N		
Storage		5			0		
RT Channelized			0				0
Lanes	0	0	0	0	0	0	
Configuration		LR					
Delay, Queue Length, and Level of Service							
Approach	Eastbound	Westbound	Northbound			Southbound	
Movement	1	4	7	8	9	10	11
Lane Configuration		LT		LR			
v (veh/h)		83		513			
C (m) (veh/h)		601		695			
v/c		0.14		0.74			
95% queue length		0.48		6.56			
Control Delay (s/veh)		11.9		29.0			
LOS		B		D			
Approach Delay (s/veh)	--	--	29.0				
Approach LOS	--	--	D				

TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	AJM			Intersection	W. Main Street & I-80 EB Ramps			
Agency/Co.	AECOM			Jurisdiction				
Date Performed	8/2/2013			Analysis Year	No Build 2045			
Analysis Time Period	P.M. Peak Hour							
Project Description <i>Interstate 80 Reconstruction</i>								
East/West Street: <i>W. Main Street (SR 2012)</i>				North/South Street: <i>I-80 EB Ramps</i>				
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>				
Vehicle Volumes and Adjustments								
Major Street	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)		607	317	53	1347			
Peak-Hour Factor, PHF	1.00	0.90	0.93	0.70	0.88	1.00		
Hourly Flow Rate, HFR (veh/h)	0	674	340	75	1530	0		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	Undivided							
RT Channelized			0				0	
Lanes	0	1	1	0	1		0	
Configuration		T	R	LT				
Upstream Signal		0			0			
Minor Street	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)	98		373					
Peak-Hour Factor, PHF	0.87	1.00	0.85	1.00	1.00	1.00		
Hourly Flow Rate, HFR (veh/h)	112	0	438	0	0	0		
Percent Heavy Vehicles	2	0	3	0	0	0		
Percent Grade (%)		-1			0			
Flared Approach		Y			N			
Storage		5			0			
RT Channelized			0				0	
Lanes	0	0	0	0	0	0		
Configuration		LR						
Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LR				
v (veh/h)		75		550				
C (m) (veh/h)		525		155				
v/c		0.14		3.55				
95% queue length		0.50		53.25				
Control Delay (s/veh)		13.0		1206				
LOS		B		F				
Approach Delay (s/veh)	--	--	1206					
Approach LOS	--	--	F					

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	AJM			Intersection	W. Main Street & I-80 WB Ramps		
Agency/Co.	AECOM			Jurisdiction			
Date Performed	8/2/2013			Analysis Year	No Build 2045		
Analysis Time Period	A.M. Peak Hour						
Project Description <i>Interstate 80 Reconstruction</i>							
East/West Street: <i>W. Main Street (SR 2012)</i>				North/South Street: <i>I-80 WB Ramps</i>			
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Eastbound			Westbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)	47	775			482	281	
Peak-Hour Factor, PHF	0.69	0.85	1.00	1.00	0.87	0.83	
Hourly Flow Rate, HFR (veh/h)	68	911	0	0	554	338	
Percent Heavy Vehicles	4	--	--	0	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1	1	
Configuration	LT				T	R	
Upstream Signal		0			0		
Minor Street	Northbound			Southbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)				34		251	
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.75	1.00	0.85	
Hourly Flow Rate, HFR (veh/h)	0	0	0	45	0	295	
Percent Heavy Vehicles	0	0	0	0	0	1	
Percent Grade (%)		0			-1		
Flared Approach		N			Y		
Storage		0			1		
RT Channelized			0				0
Lanes	0	0	0	0	0	0	
Configuration					LR		
Delay, Queue Length, and Level of Service							
Approach	Eastbound	Westbound	Northbound			Southbound	
Movement	1	4	7	8	9	10	11
Lane Configuration	LT						LR
v (veh/h)	68						340
C (m) (veh/h)	576						520
v/c	0.12						0.65
95% queue length	0.40						4.69
Control Delay (s/veh)	12.1						24.1
LOS	B						C
Approach Delay (s/veh)	--	--					24.1
Approach LOS	--	--					C

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	AJM			Intersection	W. Main Street & I-80 WB Ramps		
Agency/Co.	AECOM			Jurisdiction			
Date Performed	8/2/2013			Analysis Year	No Build 2045		
Analysis Time Period	P.M. Peak Hour						
Project Description <i>Interstate 80 Reconstruction</i>							
East/West Street: <i>W. Main Street (SR 2012)</i>				North/South Street: <i>I-80 WB Ramps</i>			
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Eastbound			Westbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)	72	908			882	531	
Peak-Hour Factor, PHF	0.79	0.91	1.00	1.00	0.91	0.73	
Hourly Flow Rate, HFR (veh/h)	91	997	0	0	969	727	
Percent Heavy Vehicles	3	--	--	0	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1	1	
Configuration	LT				T	R	
Upstream Signal		0			0		
Minor Street	Northbound			Southbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)				62		518	
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.83	1.00	0.85	
Hourly Flow Rate, HFR (veh/h)	0	0	0	74	0	609	
Percent Heavy Vehicles	0	0	0	0	0	1	
Percent Grade (%)		0			-1		
Flared Approach		N			Y		
Storage		0			1		
RT Channelized			0				0
Lanes	0	0	0	0	0	0	
Configuration					LR		
Delay, Queue Length, and Level of Service							
Approach	Eastbound	Westbound	Northbound			Southbound	
Movement	1	4	7	8	9	10	11
Lane Configuration	LT						LR
v (veh/h)	91						683
C (m) (veh/h)	289						195
v/c	0.31						3.50
95% queue length	1.31						64.94
Control Delay (s/veh)	23.1						1175
LOS	C						F
Approach Delay (s/veh)	--	--					1175
Approach LOS	--	--					F

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	AJM			Intersection	Dreher Ave. & I-80 EB On Ramp		
Agency/Co.	AECOM			Jurisdiction			
Date Performed	8/2/2013			Analysis Year	No Build 2045		
Analysis Time Period	A.M. Peak Hour						
Project Description <i>Interstate 80 Reconstruction</i>							
East/West Street: <i>Dreher Avenue (SR 2004)</i>				North/South Street: <i>I-80 EB On Ramp</i>			
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Eastbound			Westbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		243	138	81	171		
Peak-Hour Factor, PHF	1.00	0.85	0.59	0.90	0.95	1.00	
Hourly Flow Rate, HFR (veh/h)	0	285	233	90	180	0	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1		0
Configuration			TR	LT			
Upstream Signal		0			0		
Minor Street	Northbound			Southbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)							
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	0	
Percent Heavy Vehicles	0	0	0	0	0	0	
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	0	0	0	0	0	
Configuration							
Delay, Queue Length, and Level of Service							
Approach	Eastbound	Westbound	Northbound			Southbound	
Movement	1	4	7	8	9	10	11
Lane Configuration		LT					
v (veh/h)		90					
C (m) (veh/h)		796					
v/c		0.11					
95% queue length		0.38					
Control Delay (s/veh)		10.1					
LOS		B					
Approach Delay (s/veh)	--	--					
Approach LOS	--	--					

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	AJM			Intersection	Dreher Ave. & I-80 EB On Ramp		
Agency/Co.	AECOM			Jurisdiction			
Date Performed	8/2/2013			Analysis Year	No Build 2045		
Analysis Time Period	P.M. Peak Hour						
Project Description <i>Interstate 80 Reconstruction</i>							
East/West Street: <i>Dreher Avenue (SR 2004)</i>				North/South Street: <i>I-80 EB On Ramp</i>			
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Eastbound			Westbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		209	85	104	441		
Peak-Hour Factor, PHF	1.00	0.82	0.66	0.76	0.79	1.00	
Hourly Flow Rate, HFR (veh/h)	0	254	128	136	558	0	
Percent Heavy Vehicles	0	--	--	2	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1		0
Configuration			TR	LT			
Upstream Signal		0			0		
Minor Street	Northbound			Southbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)							
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	0	
Percent Heavy Vehicles	0	0	0	0	0	0	
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	0	0	0	0	0	
Configuration							
Delay, Queue Length, and Level of Service							
Approach	Eastbound	Westbound	Northbound			Southbound	
Movement	1	4	7	8	9	10	11
Lane Configuration		LT					
v (veh/h)		136					
C (m) (veh/h)		880					
v/c		0.15					
95% queue length		0.55					
Control Delay (s/veh)		9.8					
LOS		A					
Approach Delay (s/veh)	--	--					
Approach LOS	--	--					

TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	AJM			Intersection	Dreher Ave. & I-80 WB Off Ramp			
Agency/Co.	AECOM			Jurisdiction				
Date Performed	8/2/2013			Analysis Year	No Build 2045			
Analysis Time Period	A.M. Peak Hour							
Project Description <i>Interstate 80 Reconstruction</i>								
East/West Street: <i>Dreher Avenue (SR 2004)</i>				North/South Street: <i>I-80 WB Off Ramp</i>				
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>				
Vehicle Volumes and Adjustments								
Major Street	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)		236			215			
Peak-Hour Factor, PHF	1.00	0.80	1.00	1.00	0.77	1.00		
Hourly Flow Rate, HFR (veh/h)	0	294	0	0	279	0		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	Undivided							
RT Channelized			0				0	
Lanes	0	1	0	0	1	0		
Configuration		T			T			
Upstream Signal		0			0			
Minor Street	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)	51		83					
Peak-Hour Factor, PHF	0.61	1.00	0.69	1.00	1.00	1.00		
Hourly Flow Rate, HFR (veh/h)	83	0	120	0	0	0		
Percent Heavy Vehicles	0	0	5	0	0	0		
Percent Grade (%)		-1			0			
Flared Approach		Y			N			
Storage		1			0			
RT Channelized			0				0	
Lanes	0	0	0	0	0	0		
Configuration		LR						
Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration				LR				
v (veh/h)				203				
C (m) (veh/h)				1328				
v/c				0.15				
95% queue length				0.54				
Control Delay (s/veh)				11.3				
LOS				B				
Approach Delay (s/veh)	--	--		11.3				
Approach LOS	--	--		B				

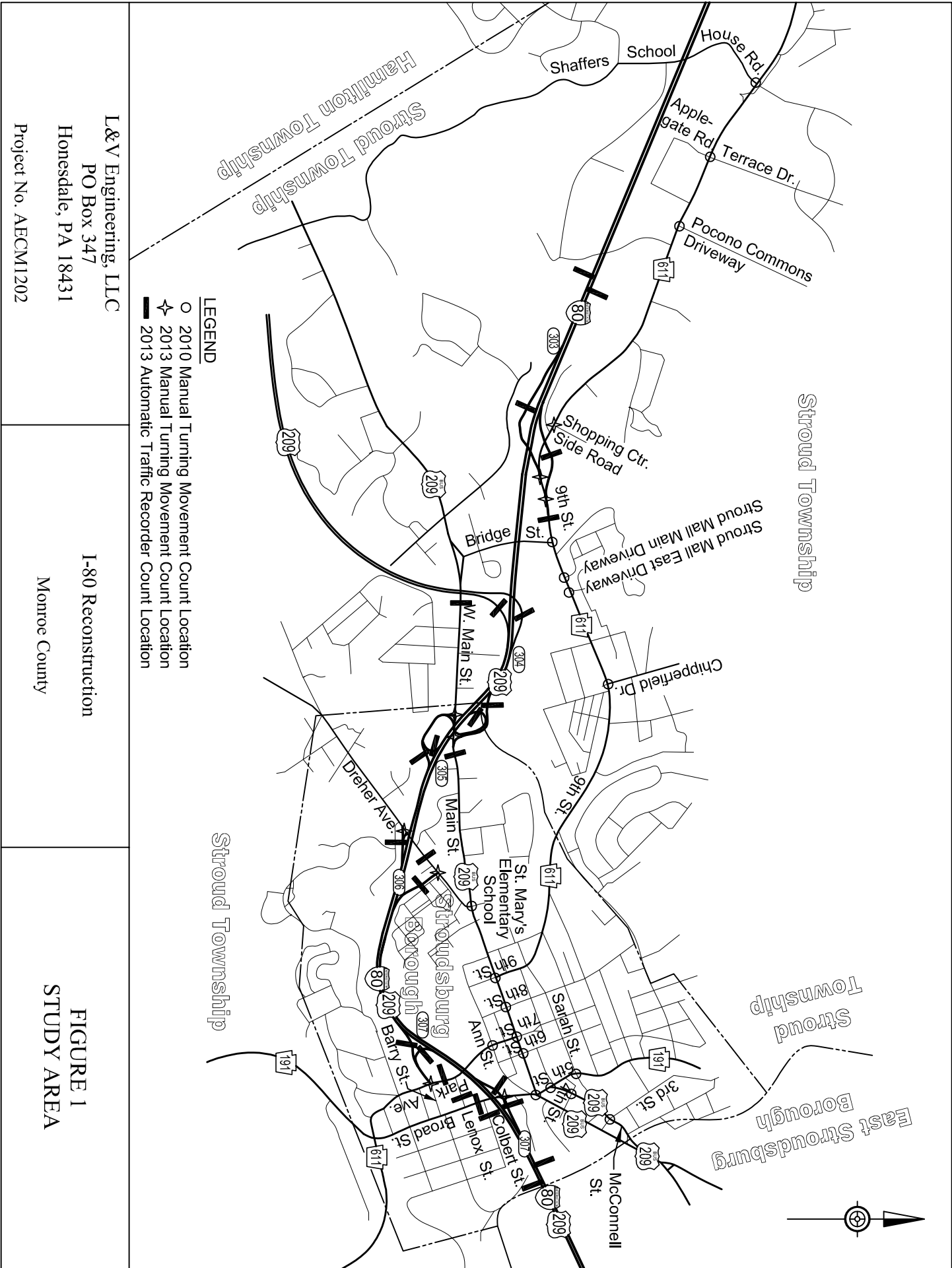
TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	AJM			Intersection	Dreher Ave. & I-80 WB Off Ramp			
Agency/Co.	AECOM			Jurisdiction				
Date Performed	8/2/2013			Analysis Year	No Build 2045			
Analysis Time Period	P.M. Peak Hour							
Project Description <i>Interstate 80 Reconstruction</i>								
East/West Street: <i>Dreher Avenue (SR 2004)</i>				North/South Street: <i>I-80 WB Off Ramp</i>				
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>				
Vehicle Volumes and Adjustments								
Major Street	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)		170			369			
Peak-Hour Factor, PHF	1.00	0.94	1.00	1.00	0.71	1.00		
Hourly Flow Rate, HFR (veh/h)	0	180	0	0	519	0		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	Undivided							
RT Channelized			0				0	
Lanes	0	1	0	0	1		0	
Configuration		T			T			
Upstream Signal		0			0			
Minor Street	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)	166		138					
Peak-Hour Factor, PHF	0.88	1.00	0.65	1.00	1.00	1.00		
Hourly Flow Rate, HFR (veh/h)	188	0	212	0	0	0		
Percent Heavy Vehicles	2	0	4	0	0	0		
Percent Grade (%)		-1			0			
Flared Approach		Y			N			
Storage		1			0			
RT Channelized			0				0	
Lanes	0	0	0	0	0		0	
Configuration		LR						
Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration				LR				
v (veh/h)				400				
C (m) (veh/h)				807				
v/c				0.50				
95% queue length				2.79				
Control Delay (s/veh)				13.8				
LOS				B				
Approach Delay (s/veh)	--	--		13.8				
Approach LOS	--	--		B				

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	AJM			Intersection	Park Avenue & I-80 EB Ramps		
Agency/Co.	AECOM			Jurisdiction			
Date Performed	8/2/2013			Analysis Year	No Build 2045		
Analysis Time Period	A.M. Peak Hour						
Project Description <i>Interstate 80 Reconstruction</i>							
East/West Street: <i>I-80 EB Ramps/Barry Street</i>				North/South Street: <i>Park Avenue (SR 611)</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)	51	205			128	155	
Peak-Hour Factor, PHF	0.84	0.83	1.00	1.00	0.85	0.82	
Hourly Flow Rate, HFR (veh/h)	60	246	0	0	150	189	
Percent Heavy Vehicles	4	--	--	0	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1	0	
Configuration	LT						TR
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)	516		202	0	13	15	
Peak-Hour Factor, PHF	0.77	1.00	0.92	0.90	0.58	0.67	
Hourly Flow Rate, HFR (veh/h)	670	0	219	0	22	22	
Percent Heavy Vehicles	4	0	8	0	14	13	
Percent Grade (%)	-1			-3			
Flared Approach		Y			N		
Storage		1			0		
RT Channelized			0				0
Lanes	0	0	0	0	1	0	
Configuration		LR			LTR		
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration	LT		LTR			LR	
v (veh/h)	60			44			889
C (m) (veh/h)	906			499			454
v/c	0.07			0.09			1.96
95% queue length	0.21			0.29			59.94
Control Delay (s/veh)	9.3			12.9			459.7
LOS	A		B			F	
Approach Delay (s/veh)	--	--	12.9			459.7	
Approach LOS	--	--	B			F	

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	AJM			Intersection	Park Avenue & I-80 EB Ramps		
Agency/Co.	AECOM			Jurisdiction			
Date Performed	8/2/2013			Analysis Year	No Build 2045		
Analysis Time Period	P.M. Peak Hour						
Project Description <i>Interstate 80 Reconstruction</i>							
East/West Street: <i>I-80 EB Ramps/Barry Street</i>				North/South Street: <i>Park Avenue (SR 611)</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)	40	296			373	219	
Peak-Hour Factor, PHF	0.66	0.79	1.00	1.00	0.75	0.60	
Hourly Flow Rate, HFR (veh/h)	60	374	0	0	497	364	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Undivided						
RT Channelized			0			0	
Lanes	0	1	0	0	1	0	
Configuration	LT						TR
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)	377		271	11	6	19	
Peak-Hour Factor, PHF	0.83	1.00	0.78	0.50	0.38	0.63	
Hourly Flow Rate, HFR (veh/h)	454	0	347	22	15	30	
Percent Heavy Vehicles	1	0	3	0	0	10	
Percent Grade (%)	-1			-3			
Flared Approach		Y			N		
Storage		1			0		
RT Channelized			0			0	
Lanes	0	0	0	0	1	0	
Configuration		LR			LTR		
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration	LT			LTR			LR
v (veh/h)	60			67			801
C (m) (veh/h)	601			104			217
v/c	0.10			0.64			3.69
95% queue length	0.33			3.21			76.91
Control Delay (s/veh)	11.7			87.8			1255
LOS	B			F			F
Approach Delay (s/veh)	--	--		87.8			1255
Approach LOS	--	--		F			F

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	AJM			Intersection	Broad Street & I-80 WB Ramps		
Agency/Co.	AECOM			Jurisdiction			
Date Performed	8/2/2013			Analysis Year	No Build 2045		
Analysis Time Period	A.M. Peak Hour						
Project Description <i>Interstate 80 Reconstruction</i>							
East/West Street: <i>I-80 WB Ramps</i>				North/South Street: <i>Broad Street (SR 191)</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)	177	733			219	296	
Peak-Hour Factor, PHF	0.78	0.78	1.00	1.00	0.88	0.84	
Hourly Flow Rate, HFR (veh/h)	226	939	0	0	248	352	
Percent Heavy Vehicles	2	--	--	0	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1	0	
Configuration	LT						TR
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)				75		285	
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.83	1.00	0.88	
Hourly Flow Rate, HFR (veh/h)	0	0	0	90	0	323	
Percent Heavy Vehicles	0	0	0	3	0	3	
Percent Grade (%)	0			-1			
Flared Approach		N			Y		
Storage		0			2		
RT Channelized			0				0
Lanes	0	0	0	0	0	0	
Configuration				LR			
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration	LT		LR				
v (veh/h)	226			413			
C (m) (veh/h)	736			213			
v/c	0.31			1.94			
95% queue length	1.30			30.14			
Control Delay (s/veh)	12.0			476.9			
LOS	B		F				
Approach Delay (s/veh)	--	--	476.9				
Approach LOS	--	--	F				

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	AJM			Intersection	Broad Street & I-80 WB Ramps		
Agency/Co.	AECOM			Jurisdiction			
Date Performed	8/2/2013			Analysis Year	No Build 2045		
Analysis Time Period	P.M. Peak Hour						
Project Description <i>Interstate 80 Reconstruction</i>							
East/West Street: <i>I-80 WB Ramps</i>				North/South Street: <i>Broad Street (SR 191)</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)	300	616			545	490	
Peak-Hour Factor, PHF	0.72	0.92	1.00	1.00	0.94	0.83	
Hourly Flow Rate, HFR (veh/h)	416	669	0	0	579	590	
Percent Heavy Vehicles	1	--	--	0	--	--	
Median Type	Undivided						
RT Channelized			0			0	
Lanes	0	1	0	0	1	0	
Configuration	LT						TR
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)				119		441	
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.79	1.00	0.91	
Hourly Flow Rate, HFR (veh/h)	0	0	0	150	0	484	
Percent Heavy Vehicles	0	0	0	3	0	1	
Percent Grade (%)		0			-1		
Flared Approach		N			Y		
Storage		0			2		
RT Channelized			0			0	
Lanes	0	0	0	0	0	0	
Configuration					LR		
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration	LT		LR				
v (veh/h)	416			634			
C (m) (veh/h)	461			16			
v/c	0.90			39.63			
95% queue length	9.99			80.21			
Control Delay (s/veh)	51.3			17839			
LOS	F			F			
Approach Delay (s/veh)	--	--	17839				
Approach LOS	--	--	F				

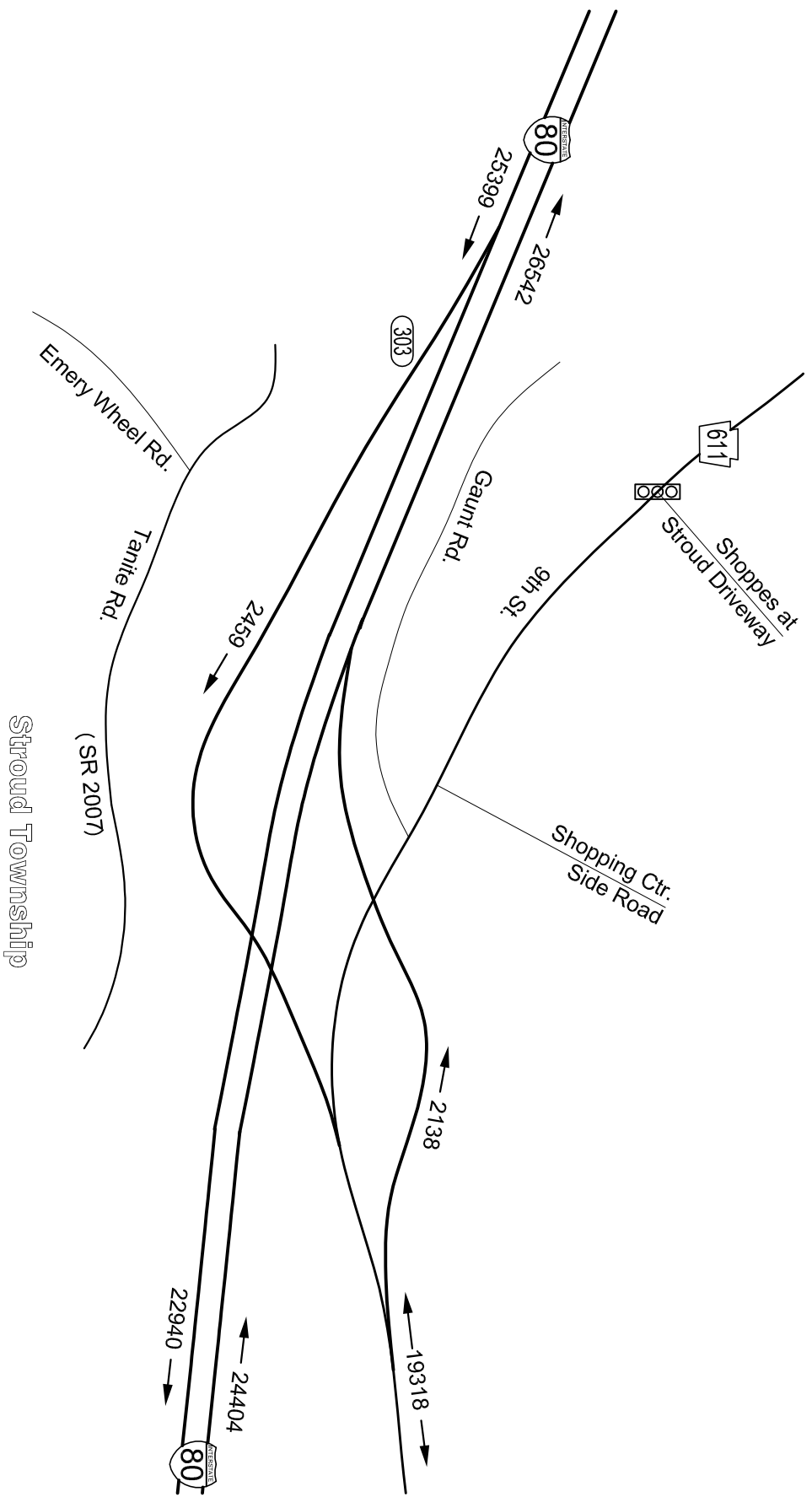


- LEGEND**
- 2010 Manual Turning Movement Count Location
 - ✦ 2013 Manual Turning Movement Count Location
 - 2013 Automatic Traffic Recorder Count Location

L&V Engineering, LLC
 PO Box 347
 Honesdale, PA 18431
 Project No. AECM1202

I-80 Reconstruction
 Monroe County

FIGURE 1
STUDY AREA



L&V Engineering, LLC
 PO Box 347
 Honesdale, PA 18431
 Project No. AECM1202

I-80 Reconstruction
 Monroe County

FIGURE 2
 ANNUAL AVERAGE
 DAILY TRAFFIC VOLUMES

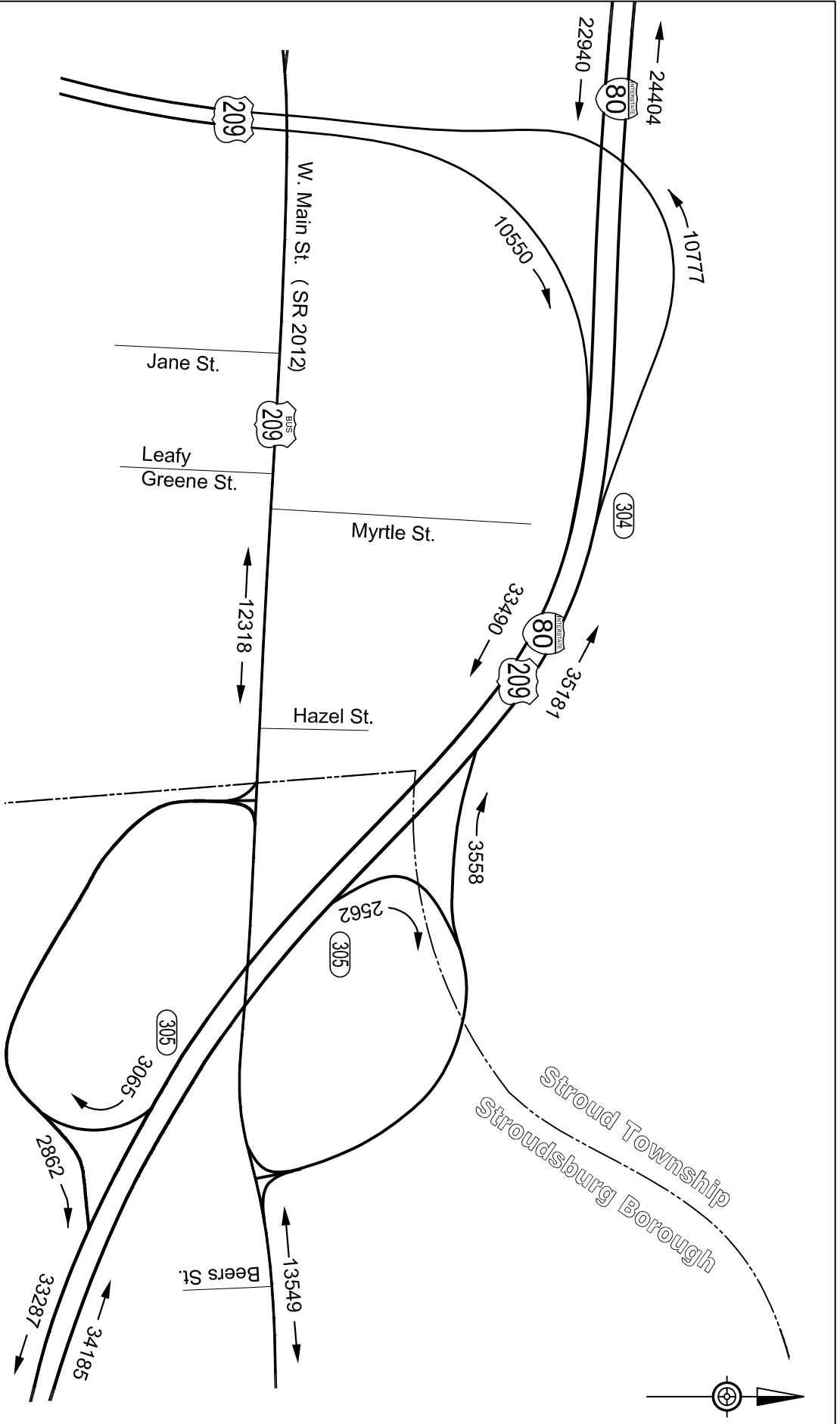


FIGURE 3
ANNUAL AVERAGE
DAILY TRAFFIC VOLUMES

I-80 Reconstruction
Monroe County

L&V Engineering, LLC
PO Box 347
Honesdale, PA 18431
Project No. AECM1202

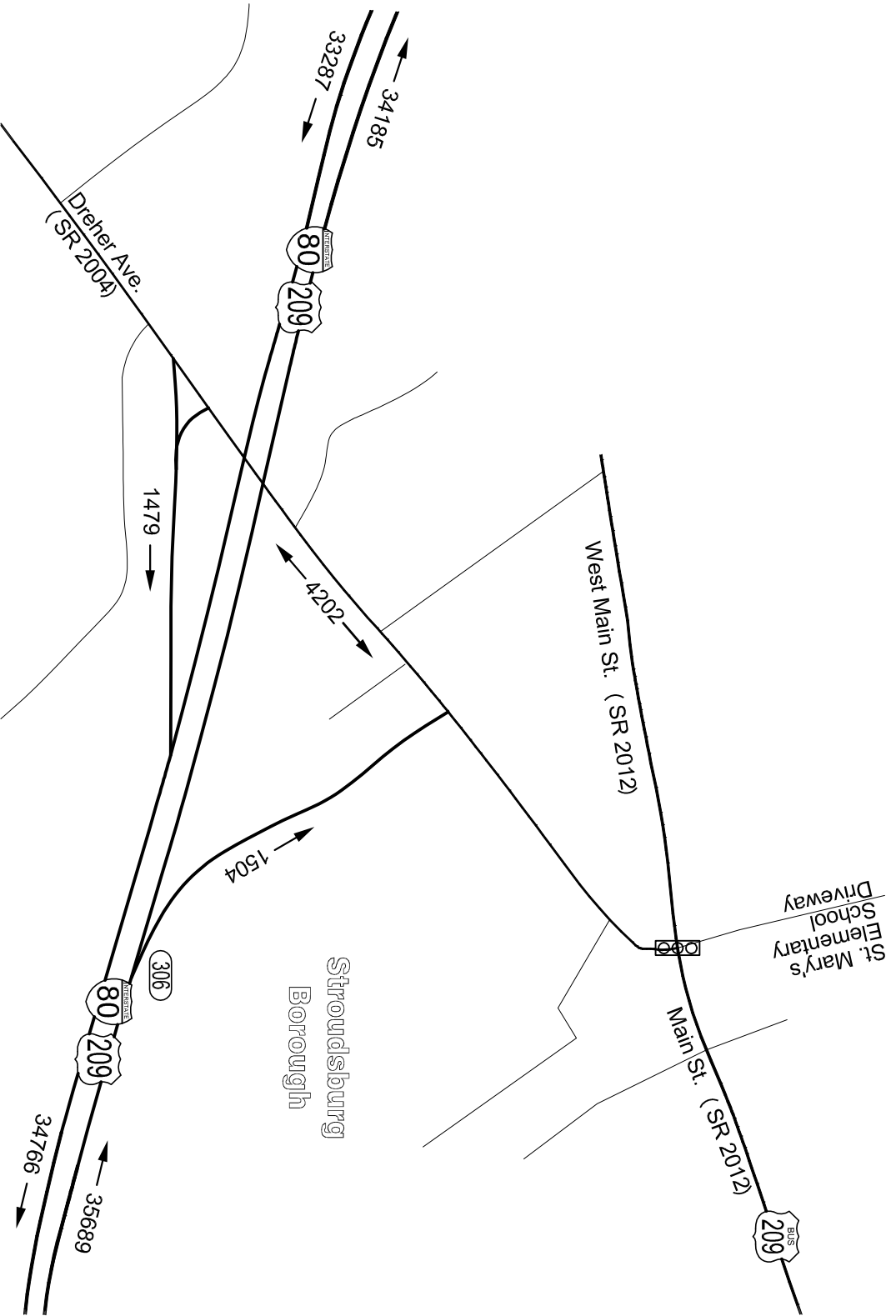
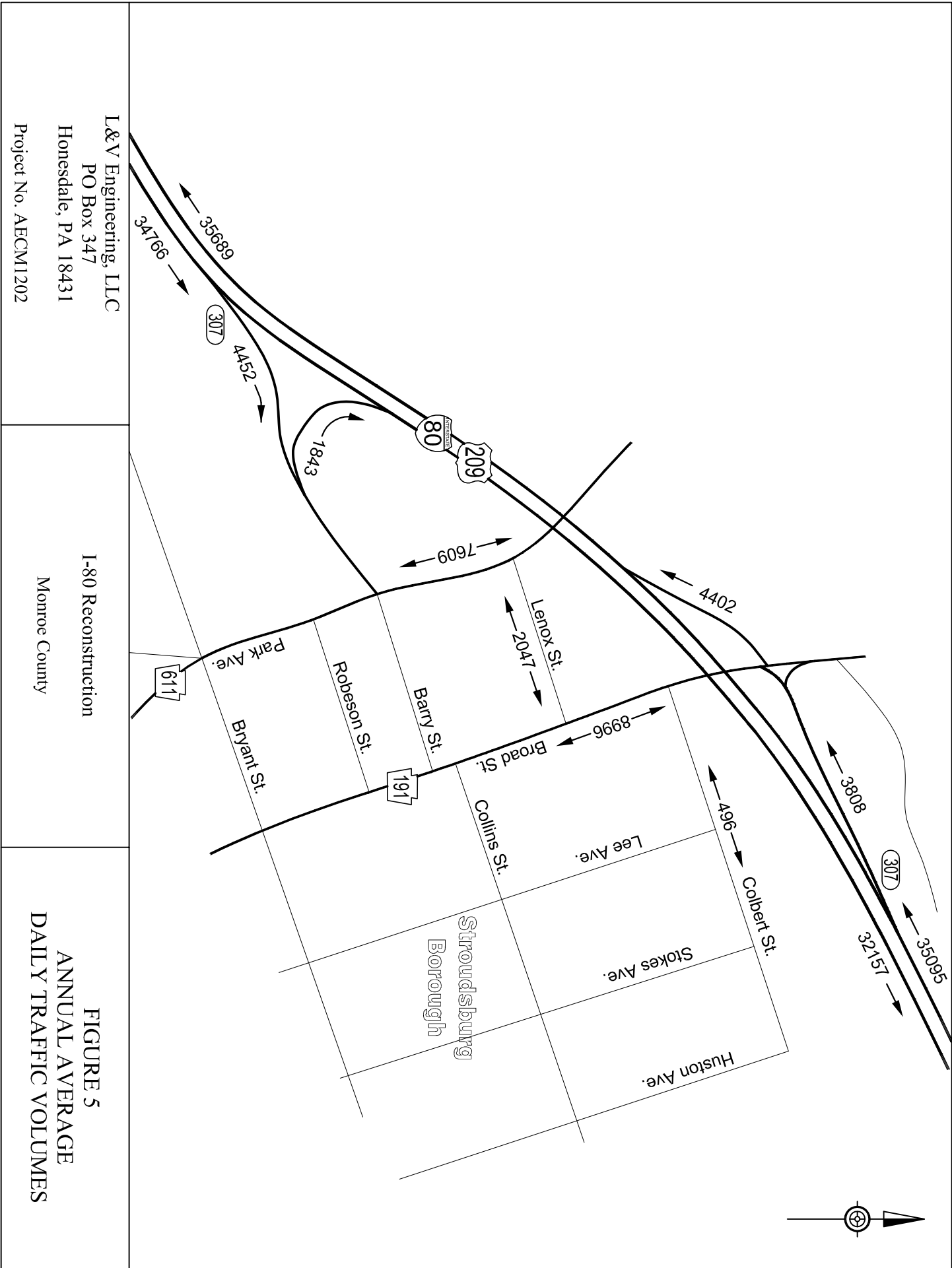


FIGURE 4
ANNUAL AVERAGE
DAILY TRAFFIC VOLUMES

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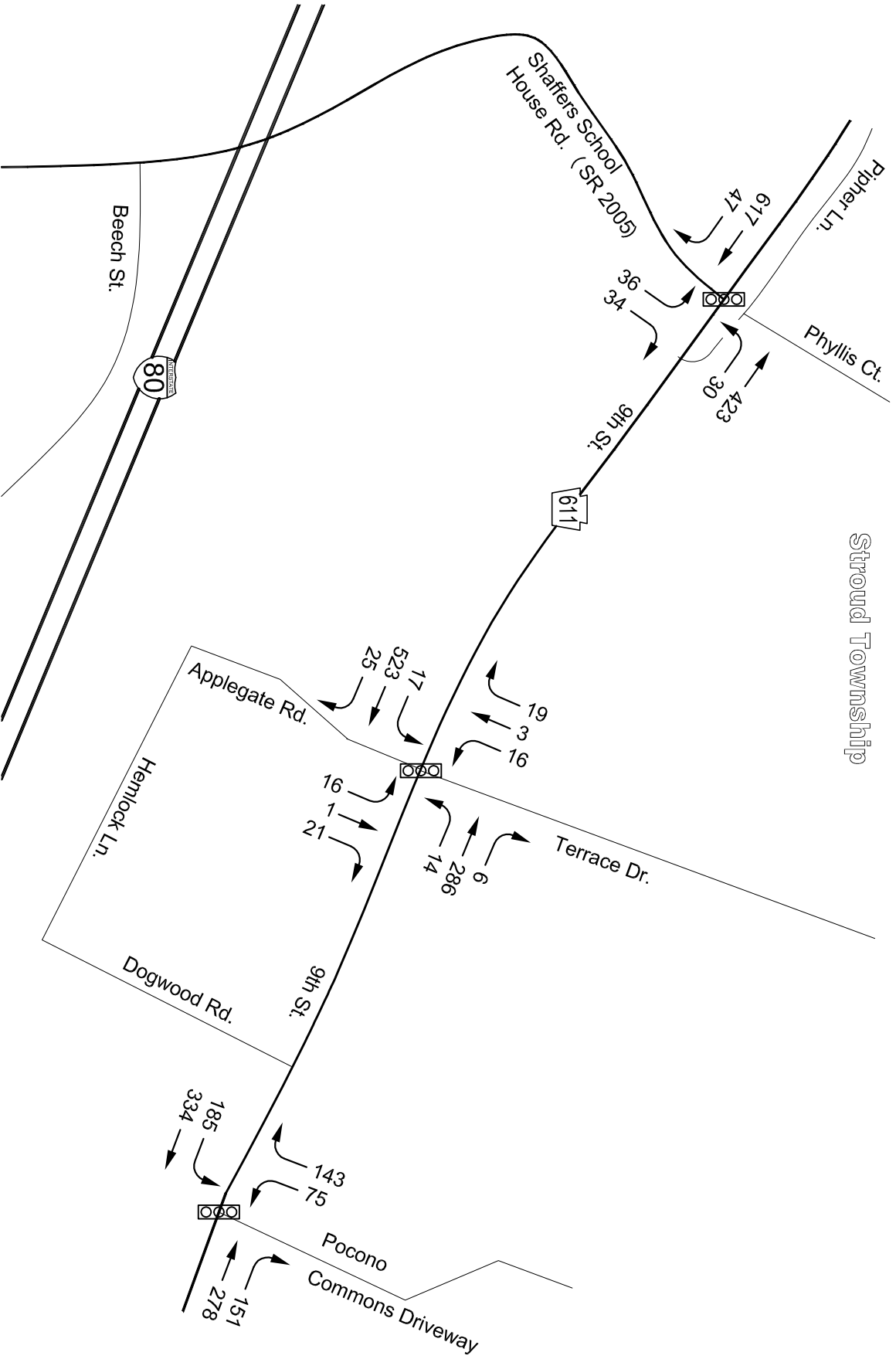


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 Project No. AECM1202

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FIGURE 5
 ANNUAL AVERAGE
 DAILY TRAFFIC VOLUMES

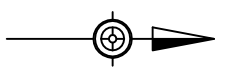
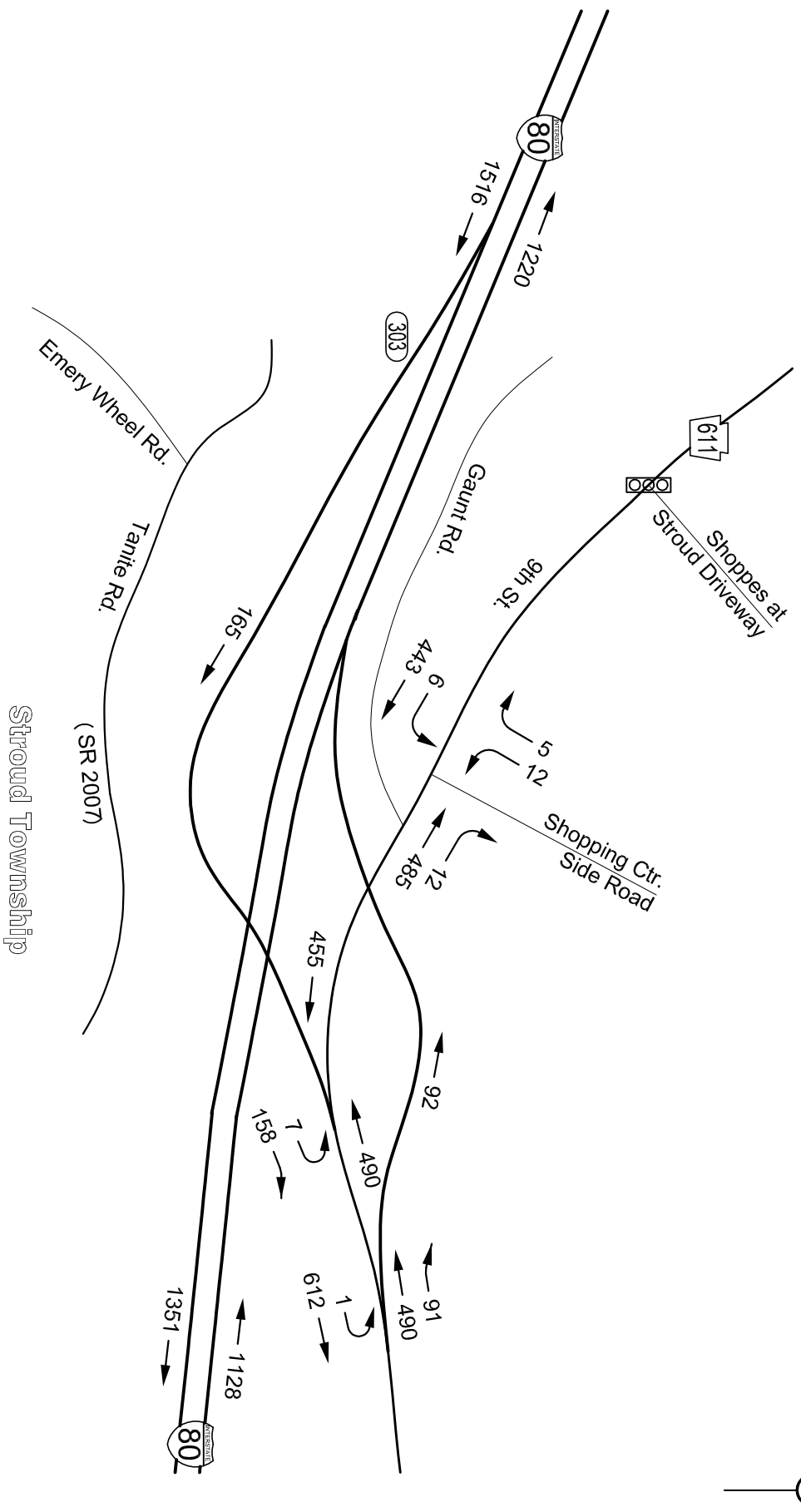
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FIGURE 6
A.M. PEAK HOUR
TRAFFIC VOLUMES

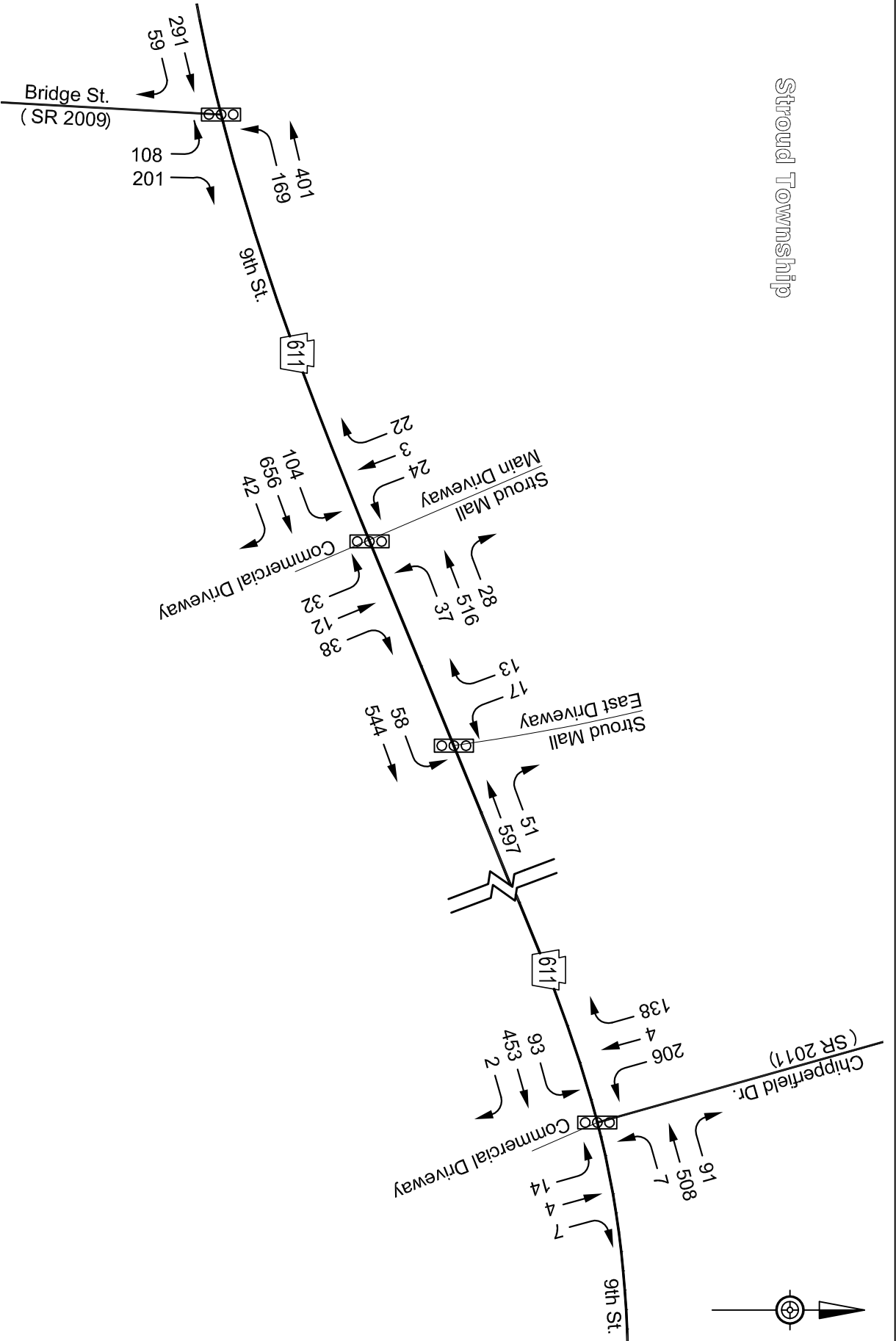


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FIGURE 7
A.M. PEAK HOUR
TRAFFIC VOLUMES

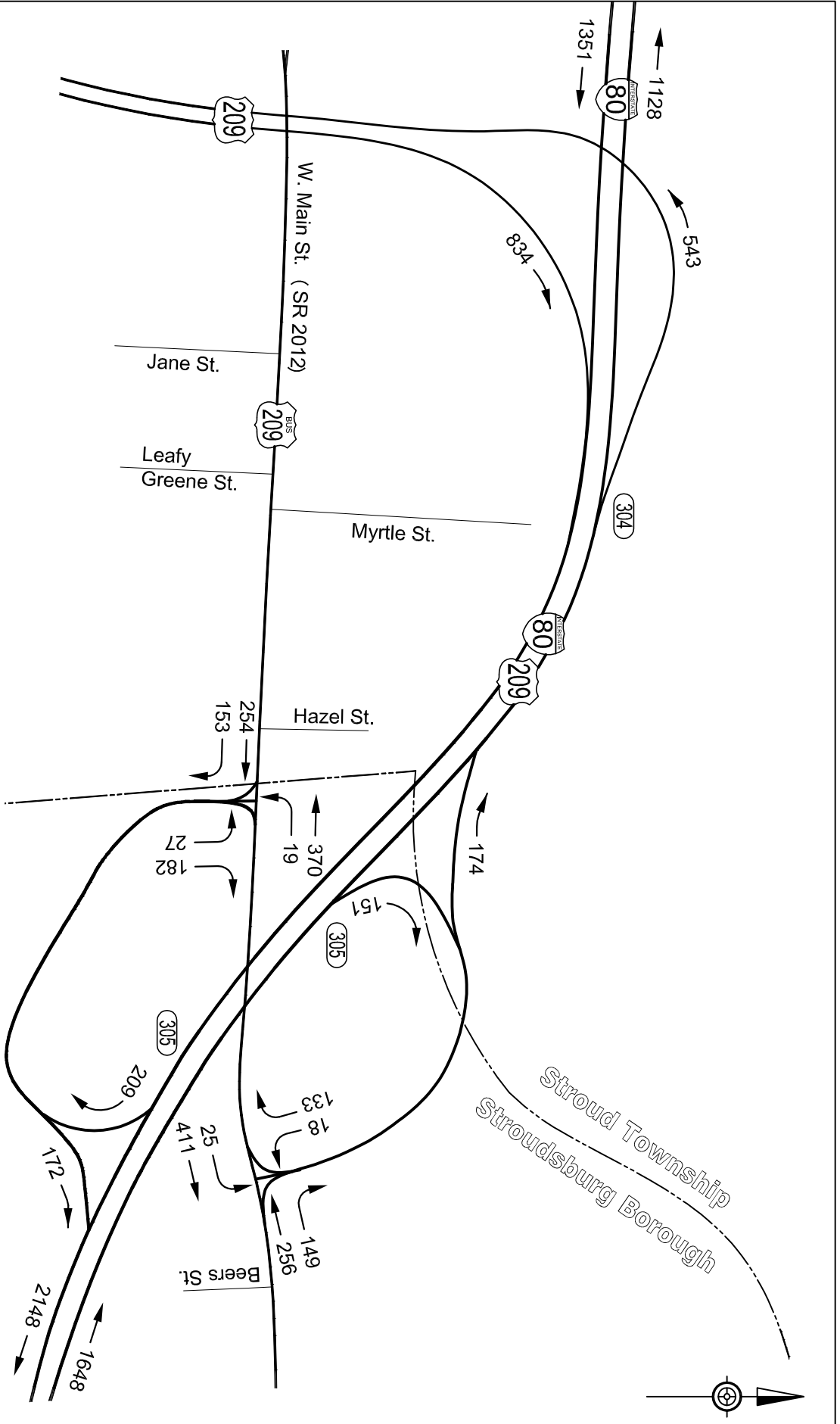
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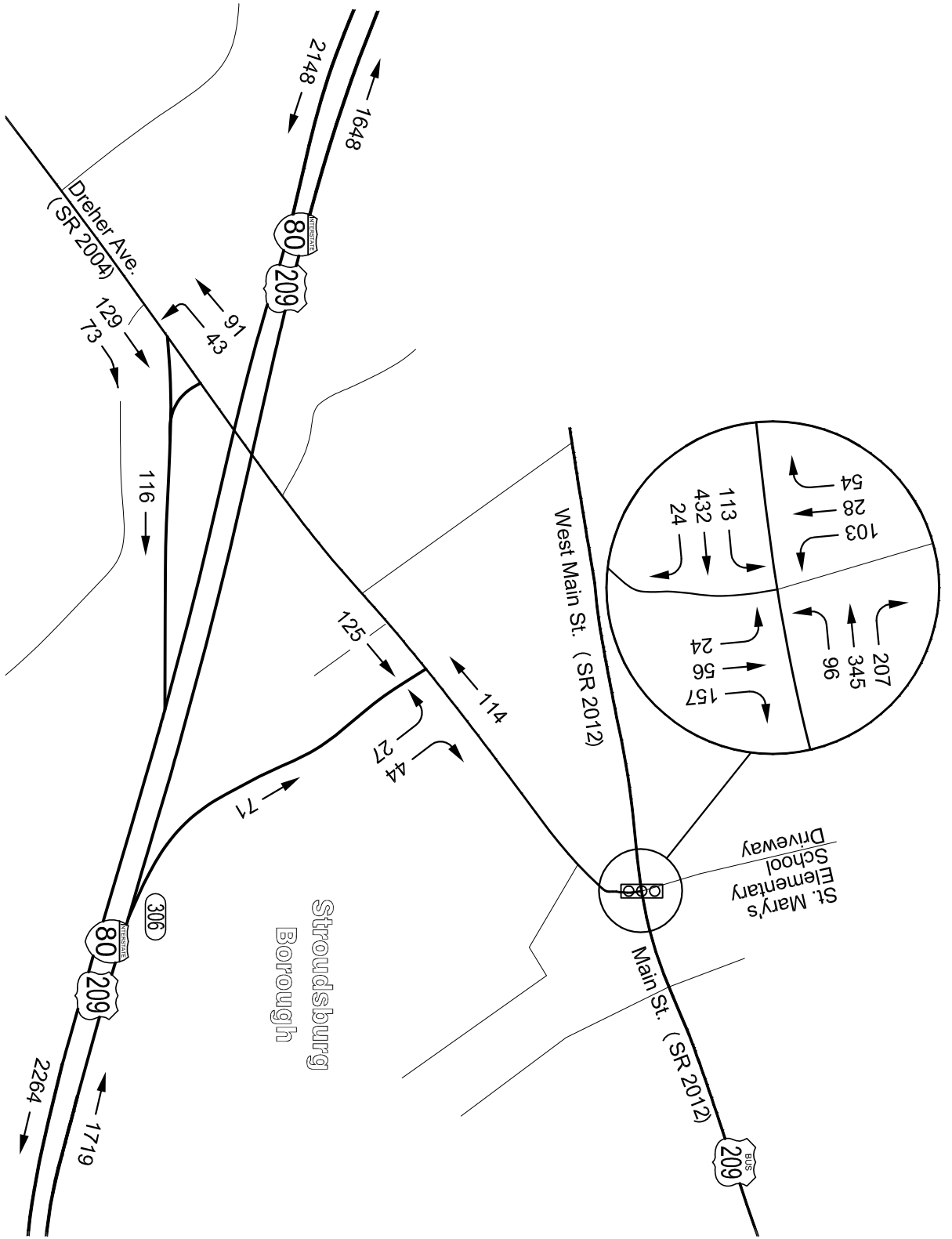
FIGURE 8
 A.M. PEAK HOUR
 TRAFFIC VOLUMES



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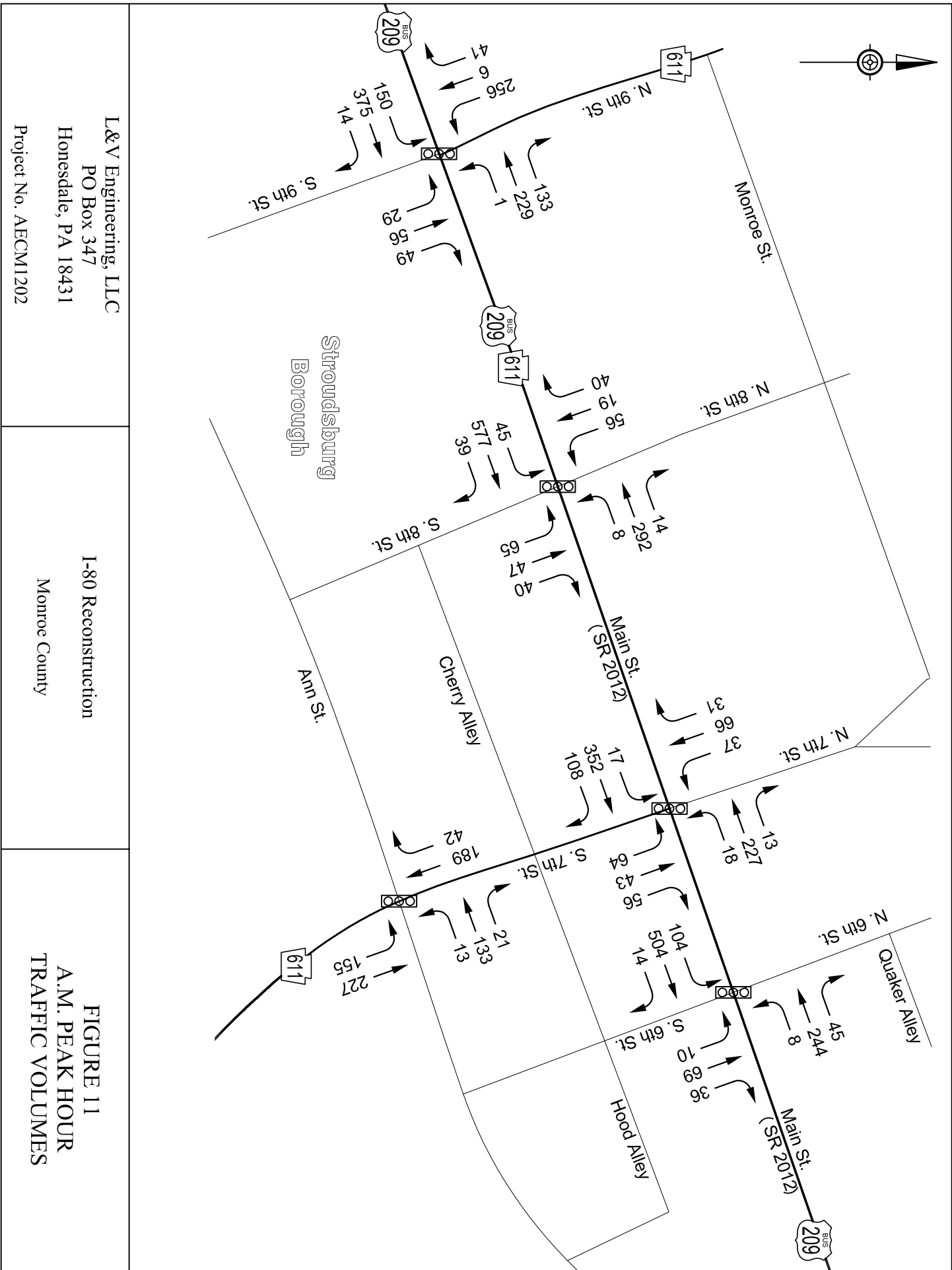
FIGURE 9
A.M. PEAK HOUR
TRAFFIC VOLUMES



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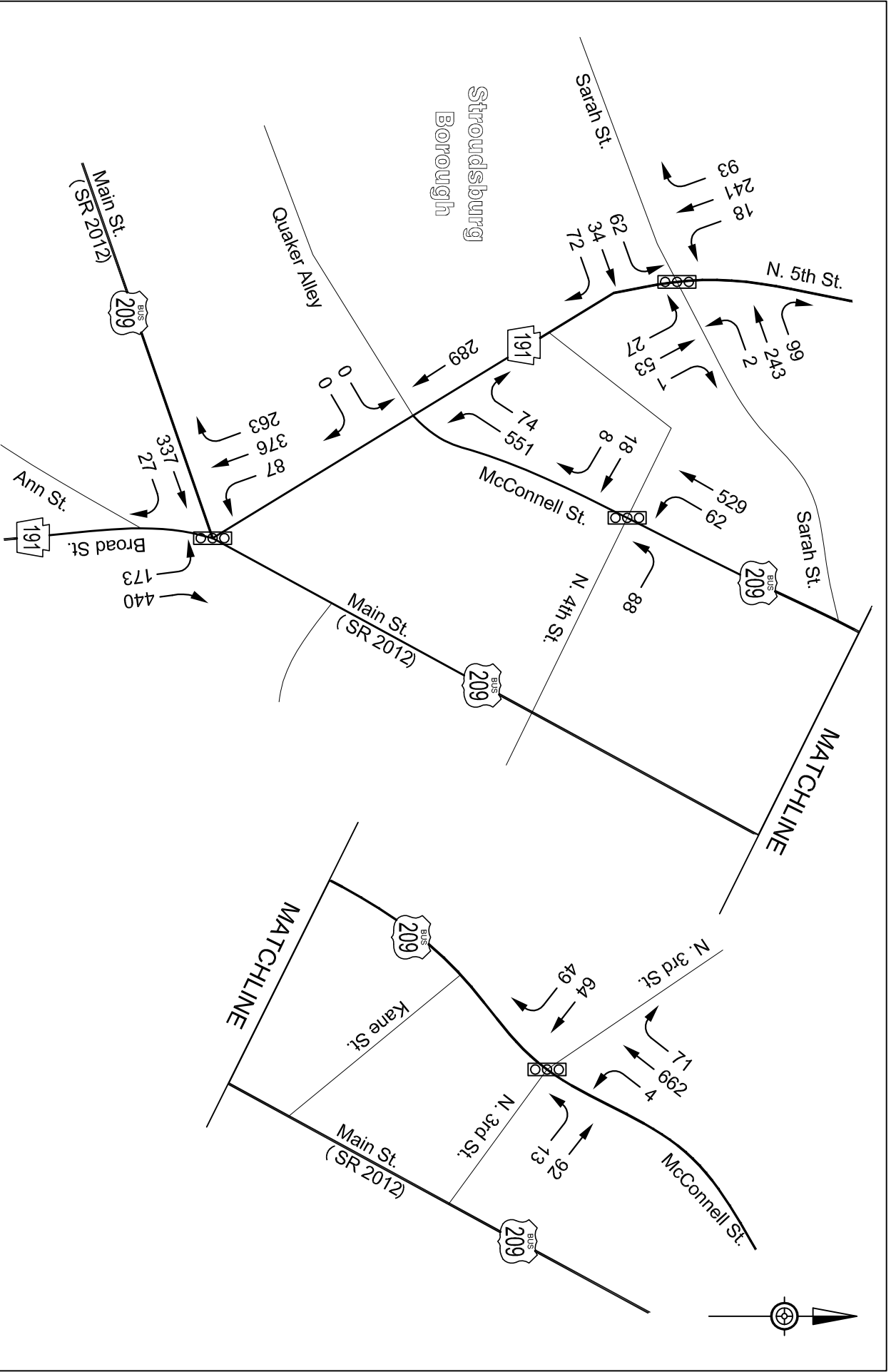
FIGURE 10
 A.M. PEAK HOUR
 TRAFFIC VOLUMES



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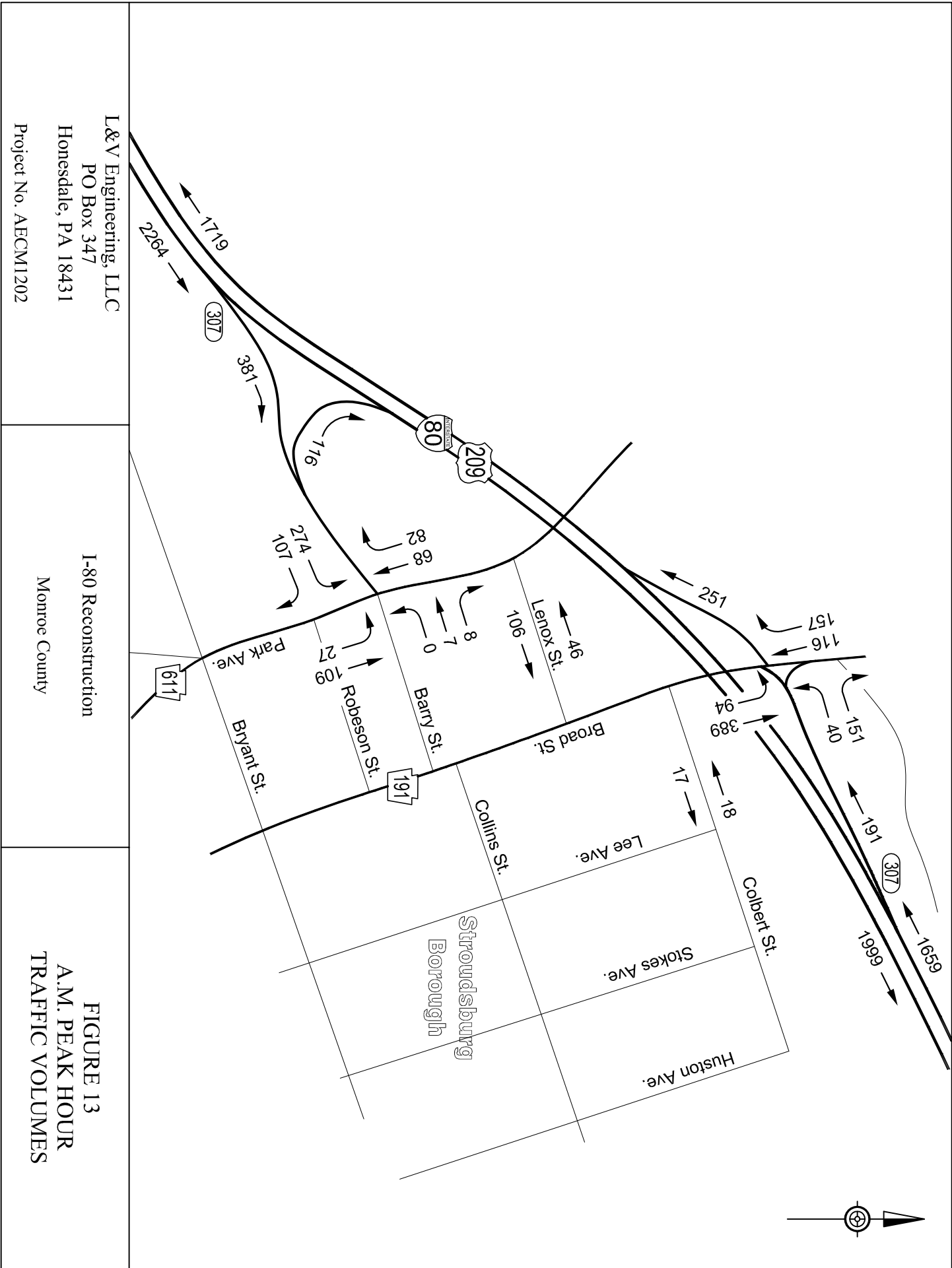
FIGURE 11
A.M. PEAK HOUR
TRAFFIC VOLUMES



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FIGURE 12
A.M. PEAK HOUR
TRAFFIC VOLUMES



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FIGURE 13
A.M. PEAK HOUR
TRAFFIC VOLUMES

Stroud Township

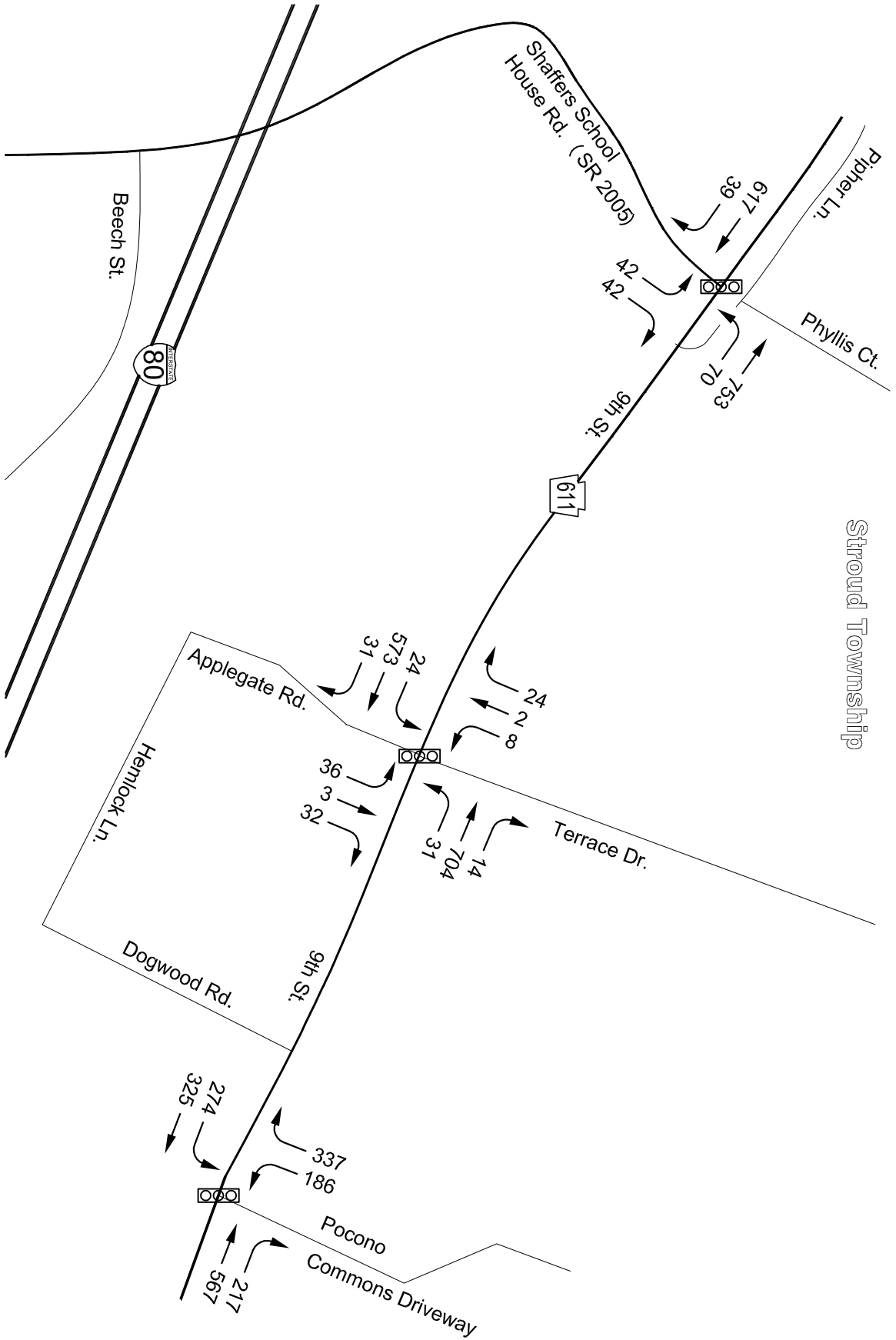


FIGURE 14
P.M. PEAK HOUR
TRAFFIC VOLUMES

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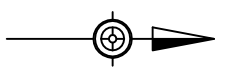
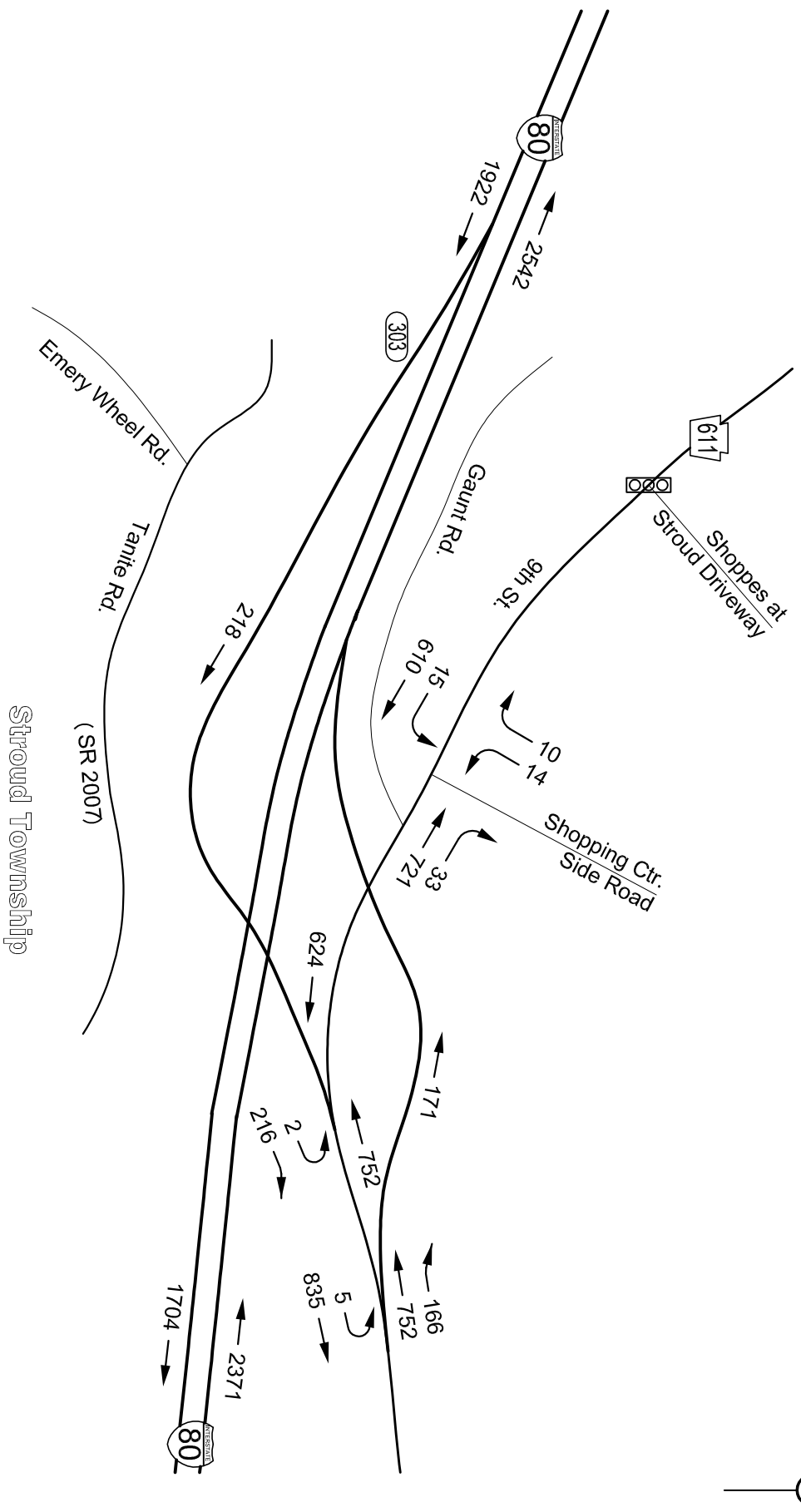
Monroe County

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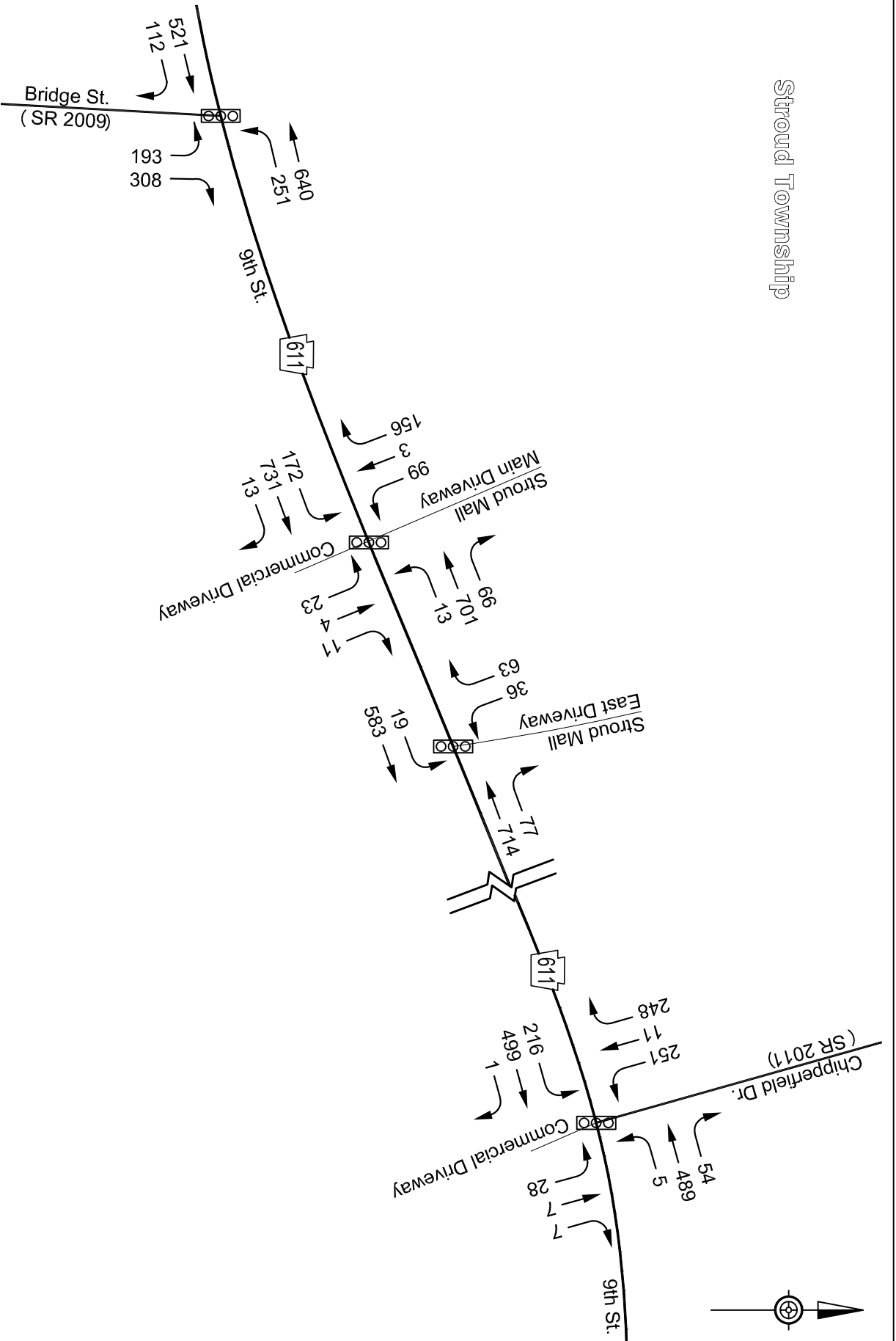


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FIGURE 15
 P.M. PEAK HOUR
 TRAFFIC VOLUMES

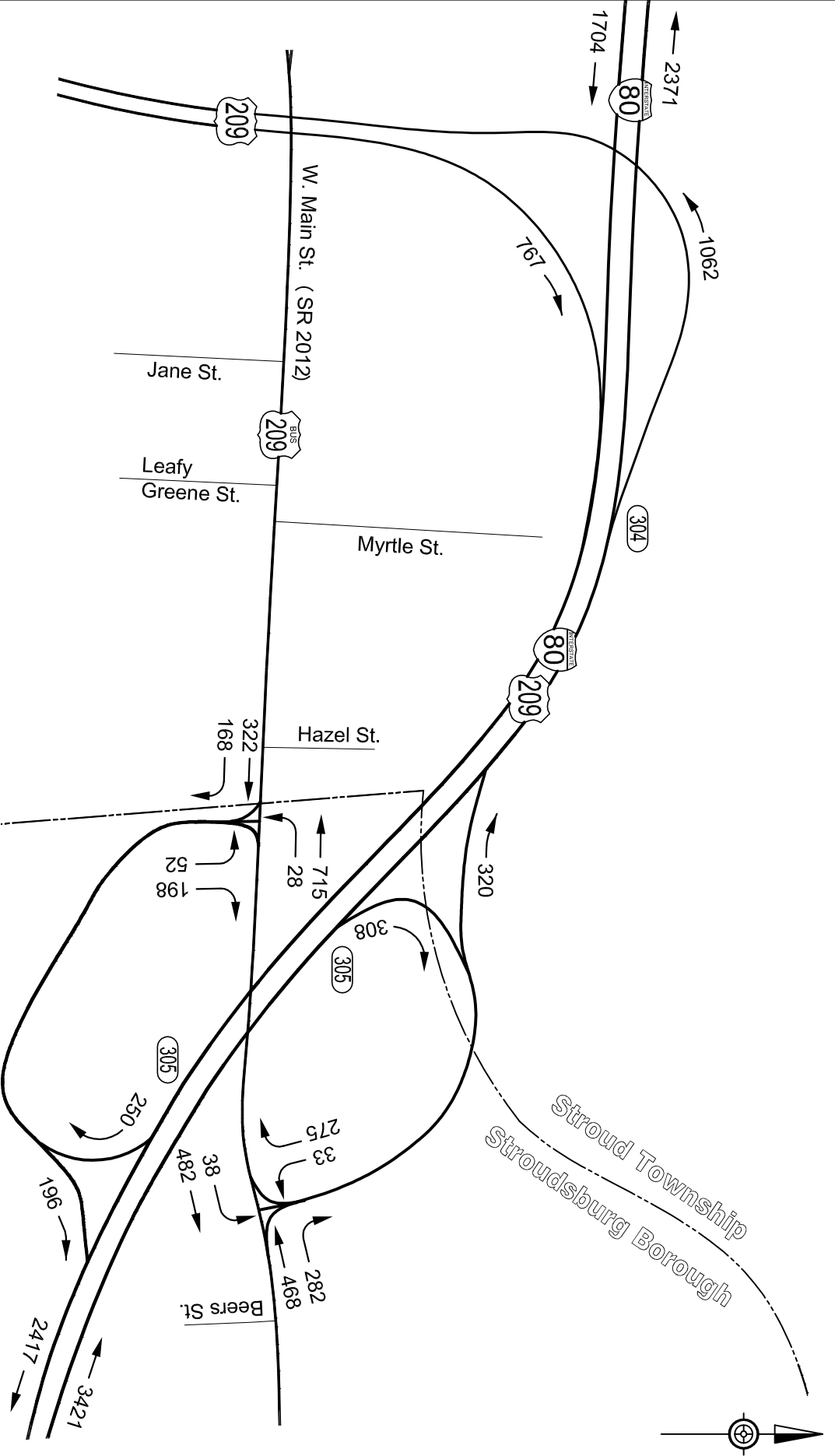
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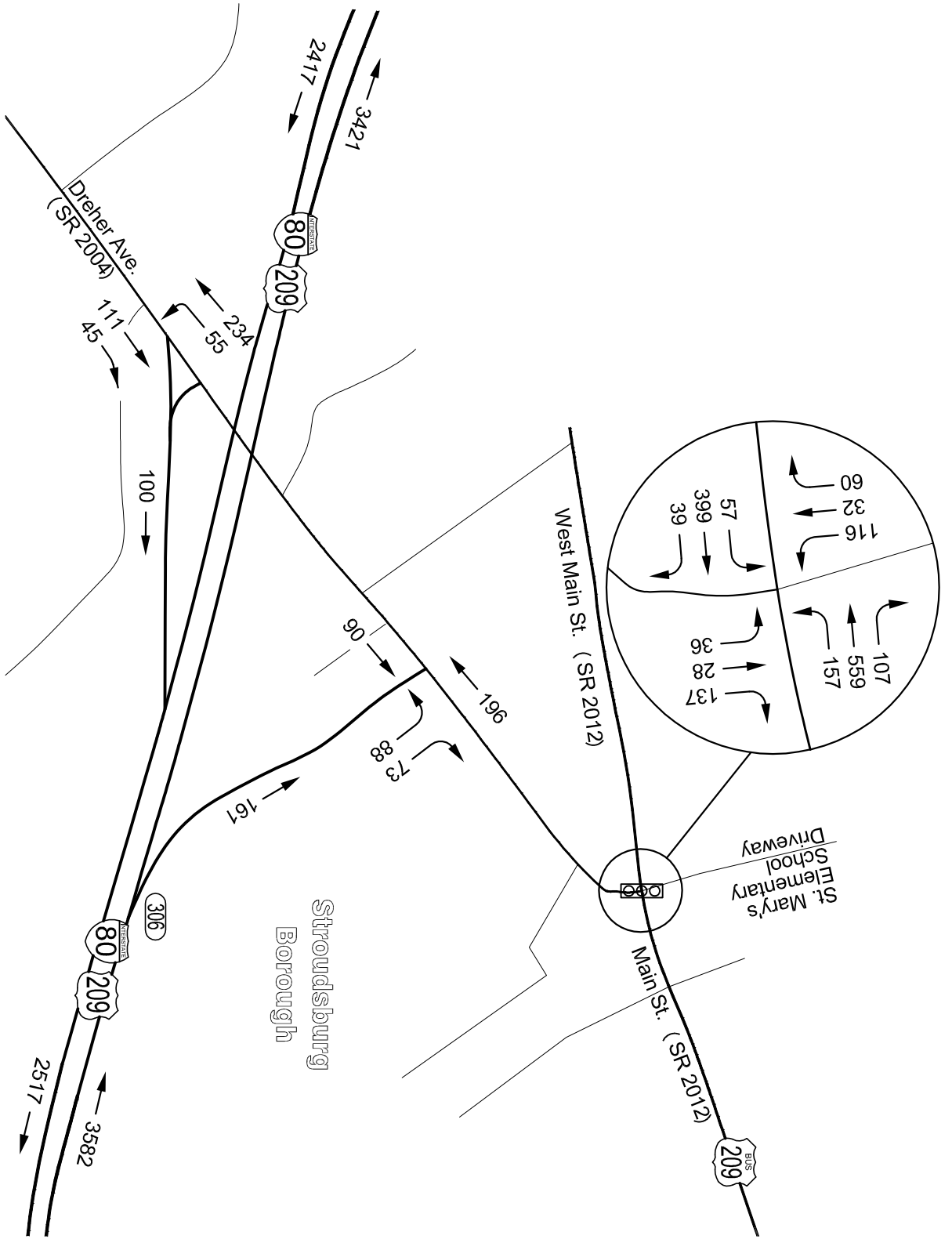
FIGURE 16
 P.M. PEAK HOUR
 TRAFFIC VOLUMES



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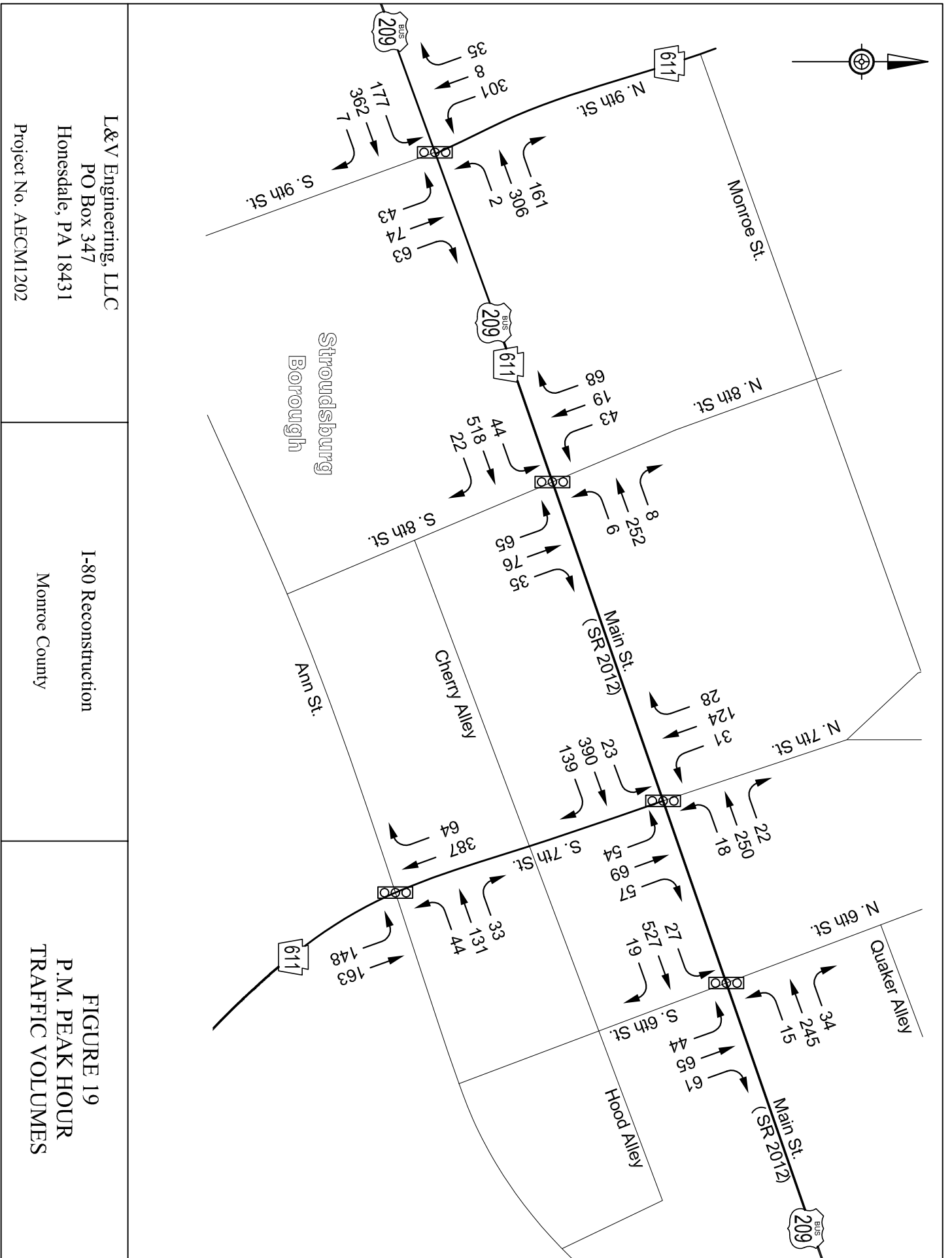
FIGURE 17
P.M. PEAK HOUR
TRAFFIC VOLUMES



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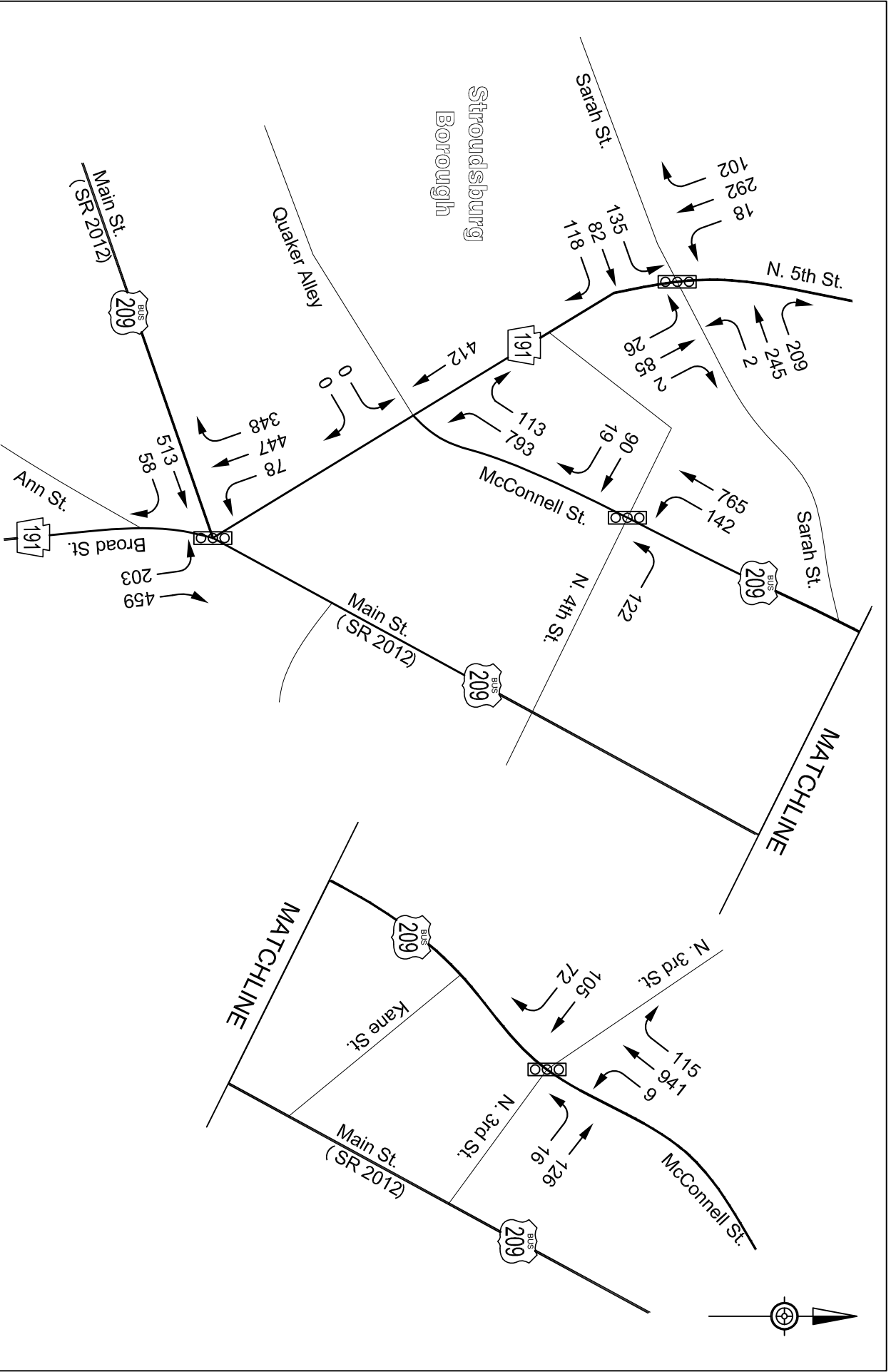
FIGURE 18
P.M. PEAK HOUR
TRAFFIC VOLUMES



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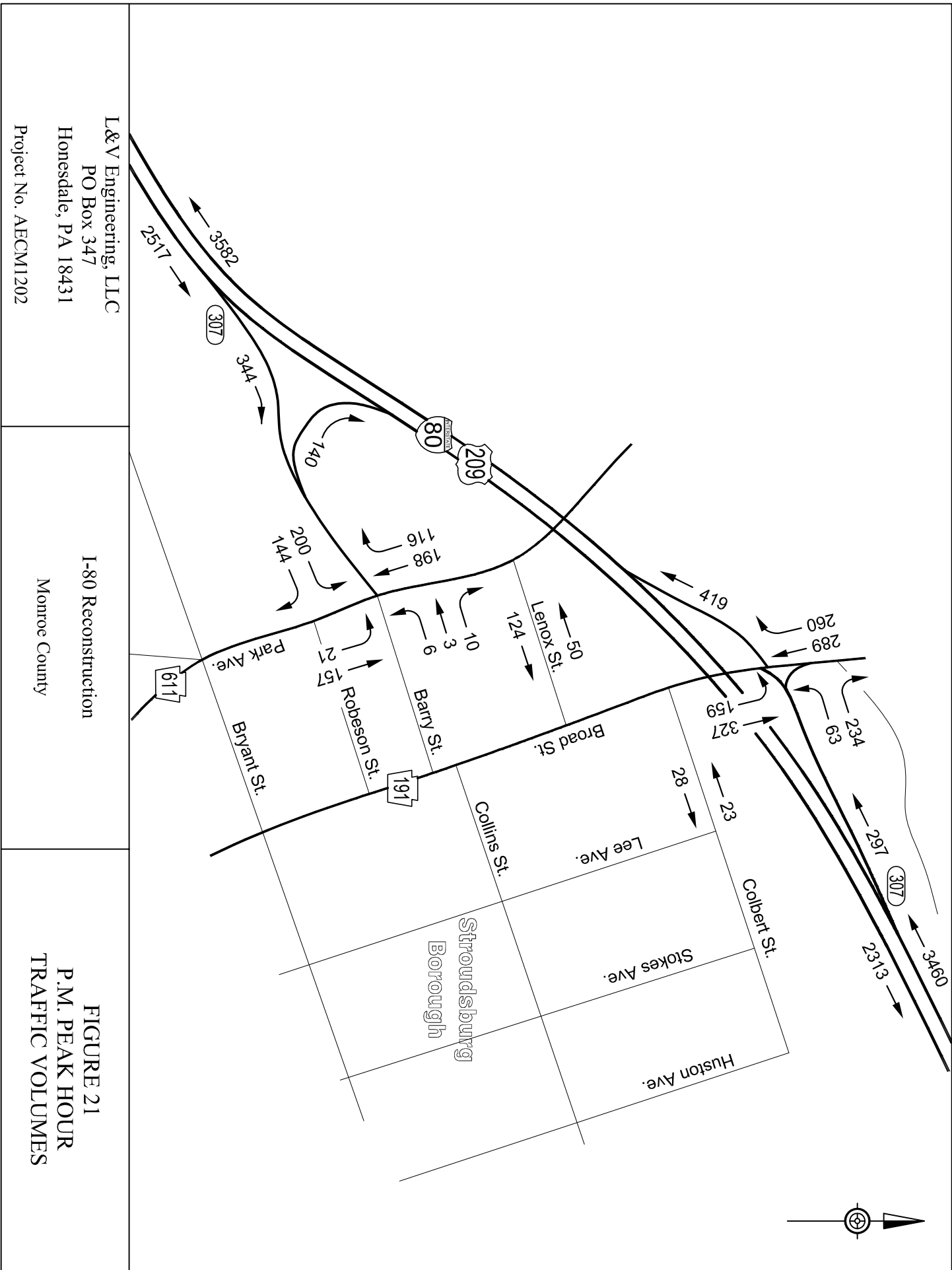
FIGURE 19
P.M. PEAK HOUR
TRAFFIC VOLUMES



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FIGURE 20
P.M. PEAK HOUR
TRAFFIC VOLUMES



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FIGURE 21
P.M. PEAK HOUR
TRAFFIC VOLUMES

Lanes, Volumes, Timings
 3: Broad St & 307 WB On Ramp/307 WB Exit Ramp

3/9/2015

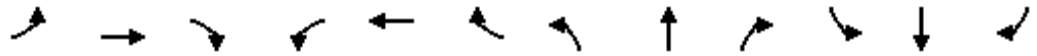


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↗	↗	↗		↗	↗
Volume (vph)	0	0	0	76	1	284	177	389	0	0	116	296
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			-1%			0%	
Storage Length (ft)	0		0	0		50	75		0	0		50
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected					0.953		0.950					
Satd. Flow (prot)	0	0	0	0	1775	1583	1778	1872	0	0	1863	1583
Flt Permitted					0.953		0.593					
Satd. Flow (perm)	0	0	0	0	1775	1583	1110	1872	0	0	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						309						322
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		283			303			238			203	
Travel Time (s)		6.4			6.9			4.6			4.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	83	1	309	192	423	0	0	126	322
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	84	309	192	423	0	0	126	322
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	0.99	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2	1	1	2			2	1
Detector Template				Left	Thru	Right	Left	Thru			Thru	Right
Leading Detector (ft)				20	100	20	20	100			100	20
Trailing Detector (ft)				0	0	0	0	0			0	0
Detector 1 Position(ft)				0	0	0	0	0			0	0
Detector 1 Size(ft)				20	6	20	20	6			6	20
Detector 1 Type				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Split	NA	Perm	pm+pt	NA			NA	Free
Protected Phases				8	8		5	2			6	
Permitted Phases						8	2					Free

Lanes, Volumes, Timings

3: Broad St & 307 WB On Ramp/307 WB Exit Ramp

3/9/2015

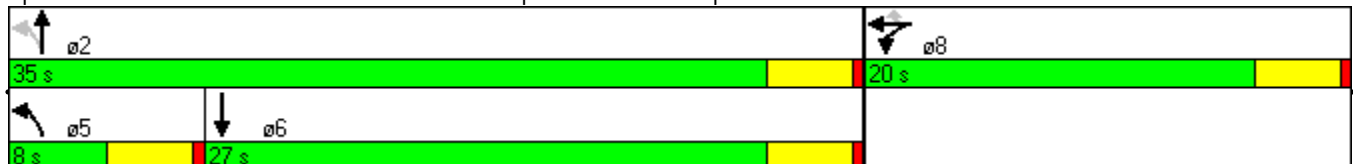


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8	8	8	5	2			6	
Switch Phase												
Minimum Initial (s)				4.0	4.0	4.0	4.0	4.0			4.0	
Minimum Split (s)				20.0	20.0	20.0	8.0	20.0			20.0	
Total Split (s)				20.0	20.0	20.0	8.0	35.0			27.0	
Total Split (%)				36.4%	36.4%	36.4%	14.5%	63.6%			49.1%	
Maximum Green (s)				16.0	16.0	16.0	4.0	31.0			23.0	
Yellow Time (s)				3.5	3.5	3.5	3.5	3.5			3.5	
All-Red Time (s)				0.5	0.5	0.5	0.5	0.5			0.5	
Lost Time Adjust (s)					0.0	0.0	0.0	0.0			0.0	
Total Lost Time (s)					4.0	4.0	4.0	4.0			4.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	
Recall Mode				None	None	None	None	C-Max			C-Max	
Act Effect Green (s)					9.0	9.0	38.0	38.0			29.3	55.0
Actuated g/C Ratio					0.16	0.16	0.69	0.69			0.53	1.00
v/c Ratio					0.29	0.60	0.23	0.33			0.13	0.20
Control Delay					21.4	8.0	4.4	4.9			9.2	0.3
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					21.4	8.0	4.4	4.9			9.2	0.3
LOS					C	A	A	A			A	A
Approach Delay					10.9			4.8			2.8	
Approach LOS					B			A			A	
Queue Length 50th (ft)					25	0	15	38			20	0
Queue Length 95th (ft)					49	49	48	109			52	0
Internal Link Dist (ft)		203			223			158			123	
Turn Bay Length (ft)						50	75					50
Base Capacity (vph)					516	680	849	1295			992	1583
Starvation Cap Reductn					0	0	0	0			0	0
Spillback Cap Reductn					0	0	0	0			0	0
Storage Cap Reductn					0	0	0	0			0	0
Reduced v/c Ratio					0.16	0.45	0.23	0.33			0.13	0.20

Intersection Summary

Area Type:	Other
Cycle Length:	55
Actuated Cycle Length:	55
Offset:	0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle:	50
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.60
Intersection Signal Delay:	5.8
Intersection LOS:	A
Intersection Capacity Utilization:	49.4%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 3: Broad St & 307 WB On Ramp/307 WB Exit Ramp



HCM Signalized Intersection Capacity Analysis

3: Broad St & 307 WB On Ramp/307 WB Exit Ramp

3/9/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↖	↑			↕	↗
Volume (vph)	0	0	0	76	1	284	177	389	0	0	116	296
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			-1%			0%	
Total Lost time (s)					4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor					1.00	1.00	1.00	1.00			1.00	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					1775	1583	1778	1872			1863	1583
Flt Permitted					0.95	1.00	0.59	1.00			1.00	1.00
Satd. Flow (perm)					1775	1583	1110	1872			1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	83	1	309	192	423	0	0	126	322
RTOR Reduction (vph)	0	0	0	0	0	258	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	84	51	192	423	0	0	126	322
Turn Type				Split	NA	Perm	pm+pt	NA			NA	Free
Protected Phases				8	8		5	2			6	
Permitted Phases						8	2					Free
Actuated Green, G (s)					9.0	9.0	38.0	38.0			28.4	55.0
Effective Green, g (s)					9.0	9.0	38.0	38.0			28.4	55.0
Actuated g/C Ratio					0.16	0.16	0.69	0.69			0.52	1.00
Clearance Time (s)					4.0	4.0	4.0	4.0			4.0	
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)					290	259	835	1293			962	1583
v/s Ratio Prot					0.05		0.02	c0.23			0.07	
v/s Ratio Perm						0.03	0.14					c0.20
v/c Ratio					0.29	0.20	0.23	0.33			0.13	0.20
Uniform Delay, d1					20.2	19.9	3.1	3.4			6.9	0.0
Progression Factor					1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2					0.6	0.4	0.1	0.7			0.3	0.3
Delay (s)					20.7	20.2	3.3	4.1			7.2	0.3
Level of Service					C	C	A	A			A	A
Approach Delay (s)		0.0			20.4			3.8			2.2	
Approach LOS		A			C			A			A	



















Intersection Summary

HCM Average Control Delay	7.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Capacity Analysis
 3: Broad St & 307 WB On Ramp/307 WB Exit Ramp

3/9/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	76	1	284	177	389	0	0	116	296
Movement Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Queue, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj. Factor (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking, Bus Adj. Factors	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Sat. Flow Rate, veh/h/ln	1900	1900	1900	1863	1863	1863	1872	1872	1900	1900	1863	1863
Lanes	0	0	0	0	1	1	1	1	0	0	1	1
Lane Assignment												
Capacity, veh/h	0	0	0	287	4	259	0	1293	0	0	1287	1094
Proportion Arriving On Green	0.00	0.00	0.00	0.16	0.16	0.16	0.00	0.69	0.00	0.00	0.69	0.69
Movement Delay, s/veh	0.0	0.0	0.0	20.7	0.0	103.9	0.0	4.1	0.0	0.0	3.0	4.0
Movement LOS				C		F		A			A	A
Approach Volume, veh/h		0			365			423			448	
Approach Delay, s/veh		0.0			84.9			4.1			3.7	
Approach LOS					F			A			A	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phase			2	8			6					
Case No			4.0	11.0			7.0					
Phase Duration (G+Y+Rc), s			42.00	13.00			42.00					
Change Period (Y+Rc), s			4.00	4.00			4.00					
Max. Allowable Headway (MAH), s			4.71	4.33			4.71					
Maximum Green Setting (Gmax), s			38.00	9.00			29.30					
Max. Queue Clearance Time (g_c+l1), s			6.96	11.00			6.34					
Green Extension Time (g_e), s			4.79	0.00			4.53					
Probability of Phase Call (p_c)			1.000	0.996			1.000					
Probability of Max Out (p_x)			0.010	1.000			0.041					
Left-Turn Movement Data												
Assigned Movement				3								
Mvmt. Sat Flow, veh/h				1752.09								
Through Movement Data												
Assigned Movement			2	8			6					
Mvmt. Sat Flow, veh/h			1872.06	23.06			1862.75					
Right-Turn Movement Data												
Assigned Movement			12	18			16					
Mvmt. Sat Flow, veh/h			0.00	1583.33			1583.33					
Left Lane Group Data												
Assigned Movement		0	0	3	0	0	0	0	0			
Lane Assignment				L+T								
Lanes in Group		0	0	1	0	0	0	0	0			
Group Volume (v), veh/h		0.0	0.0	83.7	0.0	0.0	0.0	0.0	0.0			
Group Sat. Flow (s), veh/h/ln		0.0	0.0	1775.1	0.0	0.0	0.0	0.0	0.0			
Queue Serve Time (g_s), s		0.0	0.0	2.3	0.0	0.0	0.0	0.0	0.0			
Cycle Queue Clear Time (g_c), s		0.0	0.0	2.3	0.0	0.0	0.0	0.0	0.0			

HCM 2010 Signalized Intersection Capacity Analysis

3: Broad St & 307 WB On Ramp/307 WB Exit Ramp

3/9/2015

Perm LT Sat Flow Rate (s_l), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shared LT Sat Flow (s_sh), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Eff. Green (g_p), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Que Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	38.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Proportion LT Inside Lane (P_L)	0.000	0.000	0.987	0.000	0.000	0.000	0.000	0.000
Lane Group Capacity (c), veh/h	0.0	0.0	290.5	0.0	0.0	0.0	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.000	0.288	0.000	0.000	0.000	0.000	0.000
Available Capacity (c_a), veh/h	0.0	0.0	290.5	0.0	0.0	0.0	0.0	0.0
Upstream Filter Factor (I)	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	0.0	20.2	0.0	0.0	0.0	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	20.7	0.0	0.0	0.0	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile bk-of-que factor (f_B%)	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00
Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Queue (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Movement	0	2	8	0	0	6	0	0
Lane Assignment	T					T		
Lanes in Group	0	1	0	0	0	1	0	0
Group Volume (v), veh/h	0.0	422.8	0.0	0.0	0.0	126.1	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	1872.1	0.0	0.0	0.0	1862.7	0.0	0.0
Queue Serve Time (g_s), s	0.0	5.0	0.0	0.0	0.0	1.2	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	5.0	0.0	0.0	0.0	1.2	0.0	0.0
Lane Group Capacity (c), veh/h	0.0	1293.4	0.0	0.0	0.0	1287.0	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.327	0.000	0.000	0.000	0.098	0.000	0.000
Available Capacity (c_a), veh/h	0.0	1293.4	0.0	0.0	0.0	1287.0	0.0	0.0
Upstream Filter Factor (I)	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	3.4	0.0	0.0	0.0	2.8	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.7	0.0	0.0	0.0	0.2	0.0	0.0
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	4.1	0.0	0.0	0.0	3.0	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.9	0.0	0.0	0.0	0.2	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.2	0.0	0.0	0.0	0.1	0.0	0.0
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile bk-of-que factor (f_B%)	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	1.1	0.0	0.0	0.0	0.3	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.15	0.00	0.00	0.00	0.05	0.00	0.00

HCM 2010 Signalized Intersection Capacity Analysis
 3: Broad St & 307 WB On Ramp/307 WB Exit Ramp

3/9/2015

Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Queue (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Movement	0	12	18	0	0	16	0	0
Lane Assignment			R			R		
Lanes in Group	0	0	1	0	0	1	0	0
Group Volume (v), veh/h	0.0	0.0	281.5	0.0	0.0	321.7	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	0.0	1583.3	0.0	0.0	1583.3	0.0	0.0
Queue Serve Time (g_s), s	0.0	0.0	9.0	0.0	0.0	4.3	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	0.0	9.0	0.0	0.0	4.3	0.0	0.0
Prot RT Sat Flow Rate (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff. Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Proportion RT Outside Lane (P_R)	0.000	0.000	1.000	0.000	0.000	1.000	0.000	0.000
Lane Group Capacity (c), veh/h	0.0	0.0	259.1	0.0	0.0	1093.9	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.000	1.087	0.000	0.000	0.294	0.000	0.000
Available Capacity (c_a), veh/h	0.0	0.0	259.1	0.0	0.0	1093.9	0.0	0.0
Upstream Filter Factor (I)	0.000	0.000	1.000	0.000	0.000	1.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	0.0	23.0	0.0	0.0	3.3	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.0	80.9	0.0	0.0	0.7	0.0	0.0
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	103.9	0.0	0.0	4.0	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.0	3.1	0.0	0.0	0.7	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.0	5.8	0.0	0.0	0.2	0.0	0.0
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile bk-of-que factor (f_B%)	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.0	8.9	0.0	0.0	0.9	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.00	4.52	0.00	0.00	0.44	0.00	0.00
Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Queue (Qe), veh	0.0	0.0	5.6	0.0	0.0	0.0	0.0	0.0
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Clear Time (tc), h	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM Average Control Delay	27.8
HCM Level of Service	C

Lanes, Volumes, Timings
6: Broad St & 307 EB On Ramp

3/9/2015



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	0	566	147	72	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%		-1%			0%
Storage Length (ft)	0	0		0	75	
Storage Lanes	0	0		0	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.972			
Flt Protected					0.950	
Satd. Flow (prot)	0	0	1820	0	1770	1863
Flt Permitted					0.950	
Satd. Flow (perm)	0	0	1820	0	1770	1863
Link Speed (mph)	30		35			35
Link Distance (ft)	392		180			238
Travel Time (s)	8.9		3.5			4.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	615	160	78	130
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	775	0	78	130
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	0.99	0.99	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	49.4%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings
8: Dreher Ave/School Drive & Main Street

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	113	432	40	161	345	207	28	66	183	103	28	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	14	12	11	12	14	12	14	16	14	14	12
Grade (%)		-1%			0%			1%				1%
Storage Length (ft)	145		0	125		210	85		0	105		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988				0.850		0.885			0.901	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1337	1728	0	1525	1613	1397	1483	1535	0	1567	1487	0
Flt Permitted	0.539			0.126			0.699			0.240		
Satd. Flow (perm)	759	1728	0	202	1613	1397	1091	1535	0	396	1487	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				225		104			59	
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		538			949			624			208	
Travel Time (s)		10.5			18.5			12.2			5.7	
Peak Hour Factor	0.92	0.86	0.92	0.91	0.92	0.92	0.81	0.92	0.77	0.92	0.92	0.92
Heavy Vehicles (%)	18%	4%	14%	3%	6%	11%	9%	10%	3%	10%	10%	10%
Adj. Flow (vph)	123	502	43	177	375	225	35	72	238	112	30	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	123	545	0	177	375	225	35	310	0	112	89	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.19	1.05	1.14	1.19	1.14	1.05	1.15	1.06	0.98	1.06	1.06	1.15
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	5	5		40	5	5	40	40		40	40	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	5	5		40	5	5	40	40		40	40	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	2	2		1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0	10.0	7.0	7.0		7.0	7.0	

Lanes, Volumes, Timings
 8: Dreher Ave/School Drive & Main Street

3/9/2015

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0

Lanes, Volumes, Timings
8: Dreher Ave/School Drive & Main Street

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	17.0	17.0		12.0	17.0	17.0	13.0	13.0		13.0	13.0	
Total Split (s)	58.0	58.0		18.0	76.0	76.0	40.0	40.0		40.0	40.0	
Total Split (%)	38.7%	38.7%		12.0%	50.7%	50.7%	26.7%	26.7%		26.7%	26.7%	
Maximum Green (s)	51.0	51.0		11.0	69.0	69.0	34.0	34.0		34.0	34.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	0.0	-2.0	-2.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	7.0	4.0	4.0		6.0	6.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	C-Max	C-Max	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effect Green (s)	53.0	53.0		71.0	71.0	69.0	36.0	36.0		34.0	34.0	
Actuated g/C Ratio	0.35	0.35		0.47	0.47	0.46	0.24	0.24		0.23	0.23	
v/c Ratio	0.46	0.89		0.84	0.49	0.29	0.13	0.69		1.24	0.23	
Control Delay	44.3	63.4		74.2	28.4	5.9	46.6	43.1		220.8	20.3	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	44.3	63.4		74.2	28.4	5.9	46.6	43.1		220.8	20.3	
LOS	D	E		E	C	A	D	D		F	C	
Approach Delay		59.9			32.3			43.4			132.0	
Approach LOS		E			C			D			F	
Queue Length 50th (ft)	93	500		122	191	3	27	188		-136	23	
Queue Length 95th (ft)	161	#655		#230	268	44	54	304		#268	74	
Internal Link Dist (ft)		458			869			544			128	
Turn Bay Length (ft)	145			125		210	85			105		
Base Capacity (vph)	268	613		210	763	764	262	447		90	383	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.46	0.89		0.84	0.49	0.29	0.13	0.69		1.24	0.23	







Intersection Summary

Area Type: CBD
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 58 (39%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.24
 Intersection Signal Delay: 53.5
 Intersection LOS: D
 Intersection Capacity Utilization 77.2%
 ICU Level of Service D
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
 8: Dreher Ave/School Drive & Main Street

3/9/2015

Splits and Phases: 8: Dreher Ave/School Drive & Main Street

 ø1 18 s	 ø2 58 s	 ø4 40 s	 ø9 34 s
 ø6 76 s	 ø8 40 s		

Lane Group	ø9
Minimum Split (s)	34.0
Total Split (s)	34.0
Total Split (%)	23%
Maximum Green (s)	32.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	25.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

8: Dreher Ave/School Drive & Main Street

3/9/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	113	432	40	161	345	207	28	66	183	103	28	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	14	12	11	12	14	12	14	16	14	14	12
Grade (%)		-1%			0%			1%			1%	
Total Lost time (s)	5.0	5.0		5.0	5.0	7.0	4.0	4.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.88		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1337	1729		1525	1613	1397	1483	1535		1567	1486	
Flt Permitted	0.54	1.00		0.13	1.00	1.00	0.70	1.00		0.24	1.00	
Satd. Flow (perm)	758	1729		202	1613	1397	1091	1535		396	1486	
Peak-hour factor, PHF	0.92	0.86	0.92	0.91	0.92	0.92	0.81	0.92	0.77	0.92	0.92	0.92
Adj. Flow (vph)	123	502	43	177	375	225	35	72	238	112	30	59
RTOR Reduction (vph)	0	2	0	0	0	122	0	79	0	0	46	0
Lane Group Flow (vph)	123	543	0	177	375	104	35	231	0	112	43	0
Heavy Vehicles (%)	18%	4%	14%	3%	6%	11%	9%	10%	3%	10%	10%	10%
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	51.0	51.0		69.0	69.0	69.0	34.0	34.0		34.0	34.0	
Effective Green, g (s)	53.0	53.0		71.0	71.0	69.0	36.0	36.0		34.0	34.0	
Actuated g/C Ratio	0.35	0.35		0.47	0.47	0.46	0.24	0.24		0.23	0.23	
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	268	611		210	763	643	262	368		90	337	
v/s Ratio Prot		c0.31		c0.07	0.23			0.15			0.03	
v/s Ratio Perm	0.16			0.32		0.07	0.03			c0.28		
v/c Ratio	0.46	0.89		0.84	0.49	0.16	0.13	0.63		1.24	0.13	
Uniform Delay, d1	37.4	45.7		31.3	27.1	23.6	44.8	51.0		58.0	46.2	
Progression Factor	1.00	1.00		1.73	0.95	1.80	1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.6	17.5		24.5	2.2	0.5	0.2	3.3		174.3	0.2	
Delay (s)	43.0	63.2		78.6	27.9	43.0	45.0	54.3		232.3	46.4	
Level of Service	D	E		E	C	D	D	D		F	D	
Approach Delay (s)		59.5			43.8			53.4			150.0	
Approach LOS		E			D			D			F	

Intersection Summary

HCM Average Control Delay	61.4	HCM Level of Service	E
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	50.0
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
9: 9th St & Main Street

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕	↕		↕↕		↕	↕	
Volume (vph)	150	391	14	1	321	133	29	56	49	256	6	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	11	11	12	11	11	11	10	10	10
Grade (%)		4%			1%			5%			-2%	
Storage Length (ft)	0		0	0		0	0		0	135		0
Storage Lanes	0		0	0		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt		0.992				0.850		0.953			0.861	
Flt Protected		0.983						0.990		0.950		
Satd. Flow (prot)	0	2718	0	0	1597	1252	0	1494	0	1516	1375	0
Flt Permitted		0.610			0.998			0.931		0.552		
Satd. Flow (perm)	0	1687	0	0	1594	1252	0	1405	0	881	1375	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25				35
Link Distance (ft)		352			552			437				1438
Travel Time (s)		7.9			5.2			11.9				4.1
Peak Hour Factor	0.57	0.85	0.35	0.50	0.81	0.77	0.77	0.64	0.72	0.91	1.00	0.55
Heavy Vehicles (%)	9%	3%	0%	0%	3%	4%	2%	3%	0%	1%	13%	0%
Parking (#/hr)		0	0			0						
Adj. Flow (vph)	263	460	40	2	396	173	38	88	68	281	6	75
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	763	0	0	398	173	0	194	0	281	81	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			10			10	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.22	1.30	1.17	1.20	1.20	1.31	1.23	1.23	1.23	1.23	1.23	1.23
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	50	40		50	5	5	50	40		40	40	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	50	40		50	5	5	50	40		40	40	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8				4
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	

Lanes, Volumes, Timings
9: 9th St & Main Street

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	9.5	14.5		14.5	14.5	14.5	13.0	13.0		13.0	13.0	
Total Split (s)	9.5	68.0		58.5	58.5	58.5	58.0	58.0		58.0	58.0	
Total Split (%)	6.3%	45.3%		39.0%	39.0%	39.0%	38.7%	38.7%		38.7%	38.7%	
Maximum Green (s)	5.0	63.5		54.0	54.0	54.0	52.0	52.0		52.0	52.0	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-0.5			-0.5	-0.5		-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0			4.0	4.0		4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		67.3			67.3	67.3		50.7		50.7	50.7	
Actuated g/C Ratio		0.45			0.45	0.45		0.34		0.34	0.34	
v/c Ratio		1.17dl			0.56	0.31		0.41		0.95	0.17	
Control Delay		60.4			23.7	20.5		40.3		87.6	34.8	
Queue Delay		0.0			0.9	0.0		0.0		0.0	0.0	
Total Delay		60.4			24.6	20.5		40.3		87.6	34.8	
LOS		E			C	C		D		F	C	
Approach Delay		60.4			23.3			40.3			75.8	
Approach LOS		E			C			D			E	
Queue Length 50th (ft)		-420			195	85		141		258	54	
Queue Length 95th (ft)		m#471			258	122		142		#437	97	
Internal Link Dist (ft)		272			472			357			1358	
Turn Bay Length (ft)										135		
Base Capacity (vph)		757			715	562		506		317	495	
Starvation Cap Reductn		0			122	0		0		0	0	
Spillback Cap Reductn		0			0	0		0		0	0	
Storage Cap Reductn		0			0	0		0		0	0	
Reduced v/c Ratio		1.01			0.67	0.31		0.38		0.89	0.16	

Intersection Summary

Area Type: CBD
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 62 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.01
 Intersection Signal Delay: 50.1 Intersection LOS: D
 Intersection Capacity Utilization 68.6% ICU Level of Service C
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.

Lane Group	ø9
Minimum Initial (s)	1.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	16%
Maximum Green (s)	22.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	8.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
 9: 9th St & Main Street






3/9/2015

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 9: 9th St & Main Street

 ø2	 ø4	 ø9
68 s	58 s	24 s
 ø5	 ø8	
9.5 s	58.5 s	

HCM Signalized Intersection Capacity Analysis

9: 9th St & Main Street

3/9/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕	↕		↕↕		↕	↕	
Volume (vph)	150	391	14	1	321	133	29	56	49	256	6	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	12	11	11	11	10	10	10
Grade (%)		4%			1%			5%				-2%
Total Lost time (s)		4.0			4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor		0.95			1.00	1.00		1.00		1.00	1.00	
Frt		0.99			1.00	0.85		0.95		1.00	0.86	
Flt Protected		0.98			1.00	1.00		0.99		0.95	1.00	
Satd. Flow (prot)		2718			1597	1252		1494		1516	1375	
Flt Permitted		0.61			1.00	1.00		0.93		0.55	1.00	
Satd. Flow (perm)		1688			1593	1252		1405		881	1375	
Peak-hour factor, PHF	0.57	0.85	0.35	0.50	0.81	0.77	0.77	0.64	0.72	0.91	1.00	0.55
Adj. Flow (vph)	263	460	40	2	396	173	38	88	68	281	6	75
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	763	0	0	398	173	0	194	0	281	81	0
Heavy Vehicles (%)	9%	3%	0%	0%	3%	4%	2%	3%	0%	1%	13%	0%
Parking (#/hr)		0	0			0						
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8				4
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)		66.8			66.8	66.8		48.7		48.7		48.7
Effective Green, g (s)		67.3			67.3	67.3		50.7		50.7		50.7
Actuated g/C Ratio		0.45			0.45	0.45		0.34		0.34		0.34
Clearance Time (s)		4.5			4.5	4.5		6.0		6.0		6.0
Vehicle Extension (s)		3.0			3.0	3.0		3.0		3.0		3.0
Lane Grp Cap (vph)		757			715	562		475		298		465
v/s Ratio Prot												0.06
v/s Ratio Perm		c0.45			0.25	0.14		0.14		c0.32		
v/c Ratio		1.17dl			0.56	0.31		0.41		0.94		0.17
Uniform Delay, d1		41.4			30.4	26.5		38.1		48.2		34.9
Progression Factor		0.88			0.66	0.69		1.00		1.00		1.00
Incremental Delay, d2		23.8			2.5	1.1		0.6		37.0		0.2
Delay (s)		60.0			22.6	19.4		38.7		85.2		35.1
Level of Service		E			C	B		D		F		D
Approach Delay (s)		60.0			21.7			38.7				74.0
Approach LOS		E			C			D				E

Intersection Summary

HCM Average Control Delay	48.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	32.0
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

Lanes, Volumes, Timings
 10: 8th St & Main Street/Main Street

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕			↕↕	
Volume (vph)	45	593	39	8	384	14	65	47	40	56	19	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	13	13	13	10	10	10	10	10	10
Grade (%)		0%			0%			1%			-1%	
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.989			0.994			0.958			0.954	
Flt Protected		0.996			0.998			0.982			0.977	
Satd. Flow (prot)	0	*3502	0	0	*1772	0	0	*1760	0	0	*1624	0
Flt Permitted		0.869			0.970			0.834			0.754	
Satd. Flow (perm)	0	*3021	0	0	*1733	0	0	*1405	0	0	*1397	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		552			555			340			310	
Travel Time (s)		8.5			8.2			9.3			8.5	
Peak Hour Factor	0.73	0.93	0.69	0.50	0.86	0.67	0.90	0.79	0.67	0.77	0.68	0.77
Heavy Vehicles (%)	7%	2%	5%	0%	1%	0%	3%	0%	3%	2%	0%	2%
Parking (#/hr)		0	0	0	0	0	0	0	0	0	0	0
Adj. Flow (vph)	62	638	57	16	447	21	72	59	60	73	28	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	757	0	0	484	0	0	191	0	0	153	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.19	1.27	1.19	1.10	1.25	1.10	1.26	1.43	1.26	1.24	1.24	1.24
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	5		50	5		50	40		50	40	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	50	5		50	5		50	40		50	40	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.5	14.5		14.5	14.5		12.5	12.5		12.5	12.5	
Total Split (s)	23.9	23.9		23.9	23.9		29.1	29.1		29.1	29.1	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	22.0
Total Split (s)	22.0

Lanes, Volumes, Timings
 10: 8th St & Main Street/Main Street

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	31.9%	31.9%		31.9%	31.9%		38.8%	38.8%		38.8%	38.8%	
Maximum Green (s)	19.4	19.4		19.4	19.4		23.6	23.6		23.6	23.6	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)		-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)		2.5			2.5			3.5			3.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		31.6			31.6			17.4			17.4	
Actuated g/C Ratio		0.42			0.42			0.23			0.23	
v/c Ratio		0.60			0.66			0.59			0.47	
Control Delay		16.6			24.0			32.1			28.5	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		16.6			24.0			32.1			28.5	
LOS		B			C			C			C	
Approach Delay		16.6			24.0			32.1			28.5	
Approach LOS		B			C			C			C	
Queue Length 50th (ft)		201			212			79			62	
Queue Length 95th (ft)		m229			m316			108			73	
Internal Link Dist (ft)		472			475			260			230	
Turn Bay Length (ft)												
Base Capacity (vph)		1272			730			480			477	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.60			0.66			0.40			0.32	

Intersection Summary

Area Type: CBD
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 44 (59%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.66
 Intersection Signal Delay: 21.9 Intersection LOS: C
 Intersection Capacity Utilization 60.8% ICU Level of Service B
 Analysis Period (min) 15
 * User Entered Value
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: 8th St & Main Street/Main Street



Lane Group	ø9
Total Split (%)	29%
Maximum Green (s)	20.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
 10: 8th St & Main Street/Main Street

3/9/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕			↕↕	
Volume (vph)	45	593	39	8	384	14	65	47	40	56	19	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	13	13	13	10	10	10	10	10	10
Grade (%)		0%			0%			1%			-1%	
Total Lost time (s)		2.5			2.5			3.5			3.5	
Lane Util. Factor		0.95			1.00			1.00			1.00	
Frt		0.99			0.99			0.96			0.95	
Flt Protected		1.00			1.00			0.98			0.98	
Satd. Flow (prot)		3502			1772			1760			1624	
Flt Permitted		0.87			0.97			0.83			0.75	
Satd. Flow (perm)		3021			1733			1405			1397	
Peak-hour factor, PHF	0.73	0.93	0.69	0.50	0.86	0.67	0.90	0.79	0.67	0.77	0.68	0.77
Adj. Flow (vph)	62	638	57	16	447	21	72	59	60	73	28	52
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	757	0	0	484	0	0	191	0	0	153	0
Heavy Vehicles (%)	7%	2%	5%	0%	1%	0%	3%	0%	3%	2%	0%	2%
Parking (#/hr)		0	0	0	0	0	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		29.6			29.6			15.4			15.4	
Effective Green, g (s)		31.6			31.6			17.4			17.4	
Actuated g/C Ratio		0.42			0.42			0.23			0.23	
Clearance Time (s)		4.5			4.5			5.5			5.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1273			730			326			324	
v/s Ratio Prot												
v/s Ratio Perm		0.25			0.28			0.14			0.11	
v/c Ratio		0.59			0.66			0.59			0.47	
Uniform Delay, d1		16.8			17.4			25.6			24.8	
Progression Factor		0.88			1.13			1.00			1.00	
Incremental Delay, d2		0.8			2.3			2.7			1.1	
Delay (s)		15.6			22.0			28.3			25.9	
Level of Service		B			C			C			C	
Approach Delay (s)		15.6			22.0			28.3			25.9	
Approach LOS		B			C			C			C	

Intersection Summary		
HCM Average Control Delay	20.1	HCM Level of Service C
HCM Volume to Capacity ratio	0.64	
Actuated Cycle Length (s)	75.0	Sum of lost time (s) 26.0
Intersection Capacity Utilization	60.8%	ICU Level of Service B
Analysis Period (min)	15	
c Critical Lane Group		

Lanes, Volumes, Timings

11: Seventh St/7th St & Main Street /Main Street

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕			↕↕	
Volume (vph)	17	368	20	4	319	13	158	106	138	37	13	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	13	13	13	14	14	14	11	11	11
Grade (%)		-1%			2%			4%			-1%	
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993			0.992			0.960			0.951	
Flt Protected		0.998			0.999			0.978			0.974	
Satd. Flow (prot)	0	2891	0	0	1546	0	0	1618	0	0	1383	0
Flt Permitted		0.924			0.995			0.778			0.625	
Satd. Flow (perm)	0	2677	0	0	1540	0	0	1287	0	0	888	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		555			308			456			331	
Travel Time (s)		15.1			8.4			12.4			9.0	
Peak Hour Factor	0.82	0.79	0.81	0.75	0.74	0.46	0.59	0.72	0.79	0.48	0.86	0.58
Heavy Vehicles (%)	0%	3%	1%	0%	1%	0%	4%	3%	4%	0%	1%	0%
Parking (#/hr)		0	0	0	0	0				0	0	0
Adj. Flow (vph)	21	466	25	5	431	28	268	147	175	77	15	53
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	512	0	0	464	0	0	590	0	0	145	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.19	1.27	1.19	1.11	1.27	1.11	1.08	1.08	1.08	1.19	1.35	1.19
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	5		50	5		50	40		50	40	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	50	5		50	5		50	40		50	40	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	15.0		15.0	15.0		12.0	12.0		12.0	12.0	
Total Split (s)	63.0	63.0		63.0	63.0		65.0	65.0		65.0	65.0	

Lanes, Volumes, Timings
 11: Seventh St/7th St & Main Street /Main Street

3/9/2015

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	22.0
Total Split (s)	22.0

Lanes, Volumes, Timings
 11: Seventh St/7th St & Main Street /Main Street

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	42.0%	42.0%		42.0%	42.0%		43.3%	43.3%		43.3%	43.3%	
Maximum Green (s)	58.0	58.0		58.0	58.0		60.0	60.0		60.0	60.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)		3.0			3.0			3.0			3.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		60.0			60.0			62.0			62.0	
Actuated g/C Ratio		0.40			0.40			0.41			0.41	
v/c Ratio		0.48			0.75			1.11			0.40	
Control Delay		23.5			37.5			96.3			34.9	
Queue Delay		0.0			2.4			3.4			0.0	
Total Delay		23.6			39.9			99.7			34.9	
LOS		C			D			F			C	
Approach Delay		23.6			39.9			99.7			34.9	
Approach LOS		C			D			F			C	
Queue Length 50th (ft)		111			401			~662			99	
Queue Length 95th (ft)		152			285			#612			155	
Internal Link Dist (ft)		475			228			376			251	
Turn Bay Length (ft)												
Base Capacity (vph)		1071			616			532			367	
Starvation Cap Reductn		0			67			4			0	
Spillback Cap Reductn		34			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.49			0.85			1.12			0.40	

Intersection Summary






Area Type: CBD
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.11
 Intersection Signal Delay: 55.2 Intersection LOS: E
 Intersection Capacity Utilization 60.3% ICU Level of Service B
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Lanes, Volumes, Timings

11: Seventh St/7th St & Main Street /Main Street

3/9/2015

Splits and Phases: 11: Seventh St/7th St & Main Street /Main Street

 ø2 63 s	 ø4 65 s	 ø9 22 s
 ø6 63 s	 ø8 65 s	

Lane Group	ø9
Total Split (%)	15%
Maximum Green (s)	20.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	9.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

11: Seventh St/7th St & Main Street /Main Street

3/9/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕			↕↕	
Volume (vph)	17	368	20	4	319	13	158	106	138	37	13	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	13	13	13	14	14	14	11	11	11
Grade (%)		-1%			2%			4%			-1%	
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		0.95			1.00			1.00			1.00	
Frt		0.99			0.99			0.96			0.95	
Flt Protected		1.00			1.00			0.98			0.97	
Satd. Flow (prot)		2890			1546			1617			1383	
Flt Permitted		0.92			0.99			0.78			0.63	
Satd. Flow (perm)		2675			1539			1287			888	
Peak-hour factor, PHF	0.82	0.79	0.81	0.75	0.74	0.46	0.59	0.72	0.79	0.48	0.86	0.58
Adj. Flow (vph)	21	466	25	5	431	28	268	147	175	77	15	53
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	512	0	0	464	0	0	590	0	0	145	0
Heavy Vehicles (%)	0%	3%	1%	0%	1%	0%	4%	3%	4%	0%	1%	0%
Parking (#/hr)		0	0	0	0	0				0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		58.0			58.0			60.0			60.0	
Effective Green, g (s)		60.0			60.0			62.0			62.0	
Actuated g/C Ratio		0.40			0.40			0.41			0.41	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1070			616			532			367	
v/s Ratio Prot												
v/s Ratio Perm		0.19			0.30			0.46			0.16	
v/c Ratio		0.48			0.75			1.11			0.40	
Uniform Delay, d1		33.4			38.6			44.0			30.9	
Progression Factor		0.66			0.75			0.61			1.00	
Incremental Delay, d2		1.3			7.8			68.6			0.7	
Delay (s)		23.3			36.8			95.4			31.6	
Level of Service		C			D			F			C	
Approach Delay (s)		23.3			36.8			95.4			31.6	
Approach LOS		C			D			F			C	

Intersection Summary

HCM Average Control Delay	52.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
12: Seventh St & Ann St

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕			↕			↕	
Volume (vph)	0	0	0	13	133	21	155	469	0	0	34	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	16	16	16	16	16	16	10	10	10
Grade (%)		0%			2%			-5%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.981						0.918	
Flt Protected					0.994			0.988				
Satd. Flow (prot)	0	0	0	0	1853	0	0	2143	0	0	1459	0
Flt Permitted					0.994			0.887				
Satd. Flow (perm)	0	0	0	0	1853	0	0	1924	0	0	1459	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)					6						58	
Link Speed (mph)		25			25			35			25	
Link Distance (ft)		273			284			515			456	
Travel Time (s)		7.4			7.7			10.0			12.4	
Peak Hour Factor	0.92	0.92	0.92	0.52	0.82	0.69	0.82	0.80	0.92	0.92	0.91	0.73
Heavy Vehicles (%)	0%	0%	0%	2%	1%	0%	1%	2%	0%	0%	1%	0%
Parking (#/hr)				0	0	0					0	0
Adj. Flow (vph)	0	0	0	25	162	30	189	586	0	0	37	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	217	0	0	775	0	0	95	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	0.86	0.99	0.86	0.82	0.82	0.82	1.09	1.25	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	1		1	1				1
Detector Template												
Leading Detector (ft)				50	5		50	40			40	
Trailing Detector (ft)				0	0		0	0			0	
Detector 1 Position(ft)				0	0		0	0			0	
Detector 1 Size(ft)				50	5		50	40			40	
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)				0.0	0.0		0.0	0.0			0.0	
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					6		3	8			4	
Permitted Phases				6			8					
Detector Phase				6	6		3	8			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	7.0			7.0	
Minimum Split (s)				23.0	23.0		10.5	20.5			20.5	
Total Split (s)				49.0	49.0		10.5	101.0			90.5	

Lanes, Volumes, Timings
12: Seventh St & Ann St

3/9/2015

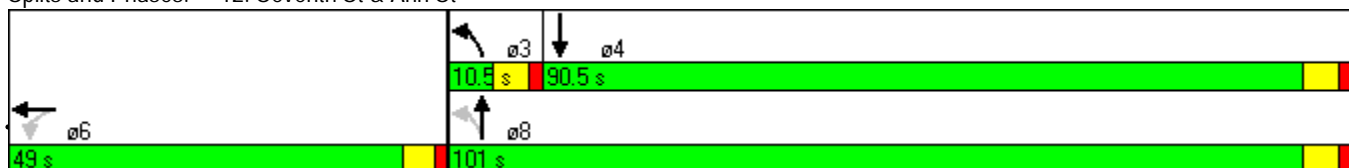


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)				32.7%	32.7%		7.0%	67.3%				60.3%
Maximum Green (s)				44.0	44.0		5.0	95.5				85.0
Yellow Time (s)				3.5	3.5		4.0	4.0				4.0
All-Red Time (s)				1.5	1.5		1.5	1.5				1.5
Lost Time Adjust (s)					-1.0			-1.0				-1.0
Total Lost Time (s)					4.0			4.5				4.5
Lead/Lag							Lead					Lag
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0				3.0
Recall Mode				C-Max	C-Max		None	None				None
Walk Time (s)				7.0	7.0			7.0				7.0
Flash Dont Walk (s)				11.0	11.0			8.0				8.0
Pedestrian Calls (#/hr)				14	14			2				2
Act Effct Green (s)					57.9			83.6				83.6
Actuated g/C Ratio					0.39			0.56				0.56
v/c Ratio					0.30			0.72				0.11
Control Delay					35.7			28.1				2.5
Queue Delay					0.0			6.2				0.0
Total Delay					35.7			34.2				2.5
LOS					D			C				A
Approach Delay					35.7			34.2				2.5
Approach LOS					D			C				A
Queue Length 50th (ft)					143			541				10
Queue Length 95th (ft)					218			451				m27
Internal Link Dist (ft)			193		204			435				376
Turn Bay Length (ft)												
Base Capacity (vph)					719			1238				900
Starvation Cap Reductn					0			0				0
Spillback Cap Reductn					1			403				0
Storage Cap Reductn					0			0				0
Reduced v/c Ratio					0.30			0.93				0.11

Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 115 (77%), Referenced to phase 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.72
 Intersection Signal Delay: 31.7
 Intersection LOS: C
 Intersection Capacity Utilization 56.0%
 ICU Level of Service B
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 12: Seventh St & Ann St



Alt 2A - AM PEAK

HCM Signalized Intersection Capacity Analysis

12: Seventh St & Ann St

3/9/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↕			↕			↕		
Volume (vph)	0	0	0	13	133	21	155	469	0	0	34	42	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	12	12	12	16	16	16	16	16	16	10	10	10	
Grade (%)		0%			2%			-5%			0%		
Total Lost time (s)					4.0			4.5			4.5		
Lane Util. Factor					1.00			1.00			1.00		
Frt					0.98			1.00			0.92		
Flt Protected					0.99			0.99			1.00		
Satd. Flow (prot)					1854			2143			1459		
Flt Permitted					0.99			0.89			1.00		
Satd. Flow (perm)					1854			1924			1459		
Peak-hour factor, PHF	0.92	0.92	0.92	0.52	0.82	0.69	0.82	0.80	0.92	0.92	0.91	0.73	
Adj. Flow (vph)	0	0	0	25	162	30	189	586	0	0	37	58	
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	0	0	26	0	
Lane Group Flow (vph)	0	0	0	0	213	0	0	775	0	0	69	0	
Heavy Vehicles (%)	0%	0%	0%	2%	1%	0%	1%	2%	0%	0%	1%	0%	
Parking (#/hr)				0	0	0					0	0	
Turn Type				Perm	NA		pm+pt	NA			NA		
Protected Phases					6		3	8			4		
Permitted Phases				6			8						
Actuated Green, G (s)					56.9			82.6			82.6		
Effective Green, g (s)					57.9			83.6			83.6		
Actuated g/C Ratio					0.39			0.56			0.56		
Clearance Time (s)					5.0			5.5			5.5		
Vehicle Extension (s)					3.0			3.0			3.0		
Lane Grp Cap (vph)					716			1072			813		
v/s Ratio Prot											0.05		
v/s Ratio Perm					0.12			c0.40					
v/c Ratio					0.30			0.72			0.09		
Uniform Delay, d1					31.9			24.6			15.4		
Progression Factor					1.00			1.00			0.45		
Incremental Delay, d2					1.1			2.4			0.0		
Delay (s)					33.0			27.1			7.0		
Level of Service					C			C			A		
Approach Delay (s)		0.0			33.0			27.1			7.0		
Approach LOS		A			C			C			A		
Intersection Summary													
HCM Average Control Delay			26.5		HCM Level of Service						C		
HCM Volume to Capacity ratio			0.55										
Actuated Cycle Length (s)			150.0		Sum of lost time (s)						8.5		
Intersection Capacity Utilization			56.0%		ICU Level of Service						B		
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
13: 6th St & Main Street

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕				
Volume (vph)	104	520	14	8	336	45	10	69	36	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	16	16	16	11	11	11	12	12	12
Grade (%)		-1%			2%			-1%			0%	
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.982			0.962				
Flt Protected		0.989			0.999			0.996				
Satd. Flow (prot)	0	2932	0	0	1680	0	0	1572	0	0	0	0
Flt Permitted		0.702			0.974			0.996				
Satd. Flow (perm)	0	2081	0	0	1638	0	0	1572	0	0	0	0
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)		3			7							
Link Speed (mph)		35			35			35				35
Link Distance (ft)		308			744			383				229
Travel Time (s)		6.0			14.5			7.5				4.5
Peak Hour Factor	0.61	0.90	0.68	0.63	0.83	0.71	0.79	0.68	0.80	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	2%	0%	0%	0%	0%
Parking (#/hr)		0	0	0	0	0						
Adj. Flow (vph)	170	578	21	13	405	63	13	101	45	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	769	0	0	481	0	0	159	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.19	1.27	1.19	0.99	1.13	0.99	1.19	1.19	1.19	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1				
Detector Template												
Leading Detector (ft)	50	5		50	5		50	40				
Trailing Detector (ft)	0	0		0	0		0	0				
Detector 1 Position(ft)	0	0		0	0		0	0				
Detector 1 Size(ft)	50	5		50	5		50	40				
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Turn Type	Perm	NA		Perm	NA		Perm	NA				
Protected Phases		2			6			4				
Permitted Phases	2			6			4					
Detector Phase	2	2		6	6		4	4				
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0				
Minimum Split (s)	15.0	15.0		15.0	15.0		12.0	12.0				
Total Split (s)	78.0	78.0		78.0	78.0		53.0	53.0				

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	19.0
Total Split (s)	19.0

Lanes, Volumes, Timings
13: 6th St & Main Street

3/9/2015

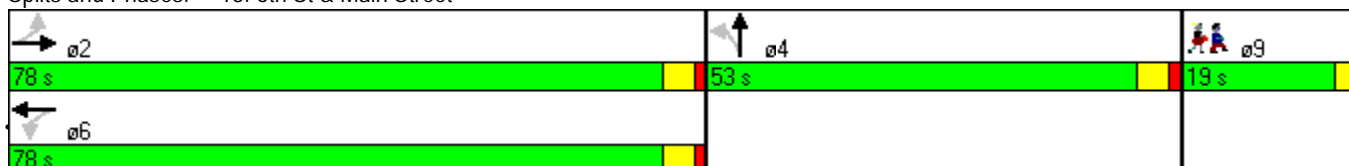


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	52.0%	52.0%		52.0%	52.0%		35.3%	35.3%				
Maximum Green (s)	73.0	73.0		73.0	73.0		48.0	48.0				
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5				
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5				
Lost Time Adjust (s)		-1.0			-1.0			-1.0				
Total Lost Time (s)		4.0			4.0			4.0				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0				
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None				
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		101.3		101.3			21.7					
Actuated g/C Ratio		0.68		0.68			0.14					
v/c Ratio		0.55		0.43			0.70					
Control Delay		9.9		13.6			76.5					
Queue Delay		0.3		0.4			0.0					
Total Delay		10.2		14.0			76.5					
LOS		B		B			E					
Approach Delay		10.2		14.0			76.5					
Approach LOS		B		B			E					
Queue Length 50th (ft)		90		205			150					
Queue Length 95th (ft)		m111		281			159					
Internal Link Dist (ft)		228		664			303				149	
Turn Bay Length (ft)												
Base Capacity (vph)		1406		1108			514					
Starvation Cap Reductn		196		255			0					
Spillback Cap Reductn		0		183			0					
Storage Cap Reductn		0		0			0					
Reduced v/c Ratio		0.64		0.56			0.31					

Intersection Summary

Area Type: CBD
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 28 (19%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 19.0 Intersection LOS: B
 Intersection Capacity Utilization 60.1% ICU Level of Service B
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: 6th St & Main Street



Lane Group	ø9
Total Split (%)	13%
Maximum Green (s)	17.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	10.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

13: 6th St & Main Street

3/9/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕↕			↕↕			↕↕					
Volume (vph)	104	520	14	8	336	45	10	69	36	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	11	11	11	16	16	16	11	11	11	12	12	12	
Grade (%)		-1%			2%			-1%			0%		
Total Lost time (s)		4.0			4.0			4.0					
Lane Util. Factor		0.95			1.00			1.00					
Frt		1.00			0.98			0.96					
Flt Protected		0.99			1.00			1.00					
Satd. Flow (prot)		2932			1680			1571					
Flt Permitted		0.70			0.97			1.00					
Satd. Flow (perm)		2082			1638			1571					
Peak-hour factor, PHF	0.61	0.90	0.68	0.63	0.83	0.71	0.79	0.68	0.80	0.92	0.92	0.92	
Adj. Flow (vph)	170	578	21	13	405	63	13	101	45	0	0	0	
RTOR Reduction (vph)	0	1	0	0	2	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	768	0	0	479	0	0	159	0	0	0	0	
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	2%	0%	0%	0%	0%	
Parking (#/hr)		0	0	0	0	0							
Turn Type	Perm	NA		Perm	NA		Perm	NA					
Protected Phases		2			6			4					
Permitted Phases	2			6			4						
Actuated Green, G (s)		100.3			100.3			20.7					
Effective Green, g (s)		101.3			101.3			21.7					
Actuated g/C Ratio		0.68			0.68			0.14					
Clearance Time (s)		5.0			5.0			5.0					
Vehicle Extension (s)		3.0			3.0			3.0					
Lane Grp Cap (vph)		1406			1106			227					
v/s Ratio Prot													
v/s Ratio Perm		c0.37			0.29			0.10					
v/c Ratio		0.55			0.43			0.70					
Uniform Delay, d1		12.5			11.2			61.1					
Progression Factor		0.64			1.03			1.00					
Incremental Delay, d2		1.3			1.2			9.4					
Delay (s)		9.3			12.7			70.4					
Level of Service		A			B			E					
Approach Delay (s)		9.3			12.7			70.4			0.0		
Approach LOS		A			B			E			A		
Intersection Summary													
HCM Average Control Delay			17.3									HCM Level of Service	B
HCM Volume to Capacity ratio			0.57										
Actuated Cycle Length (s)			150.0									Sum of lost time (s)	27.0
Intersection Capacity Utilization			60.1%									ICU Level of Service	B
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
 14: Ann St & Broad St/5th St & Main Street

3/9/2015



Lane Group	EBT	EBR	NBL2	NBR	SBL	SBT	SBR2	ø9
Lane Configurations	↑↑		↙	↗	↙	↑	↗	
Volume (vph)	353	115	200	507	87	443	263	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	11	10	11	10	10	11	
Grade (%)	-5%					2%		
Storage Length (ft)	0		0		0			
Storage Lanes	0		1		1			
Taper Length (ft)						25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	
Frt	0.963		0.850		0.850			
Flt Protected			0.950		0.950			
Satd. Flow (prot)	*3372	0	1509	1398	*1752	*1793	1377	
Flt Permitted			0.284		0.950			
Satd. Flow (perm)	*3372	0	451	1398	*1752	*1792	1377	
Right Turn on Red					No	No	Yes	
Satd. Flow (RTOR)					289			
Link Speed (mph)	25					25		
Link Distance (ft)	744					298		
Travel Time (s)	20.3					8.2		
Peak Hour Factor	0.92	0.91	0.91	0.96	0.81	0.95	0.91	
Heavy Vehicles (%)	0%	0%	1%	1%	3%	2%	1%	
Adj. Flow (vph)	384	126	220	528	107	466	289	
Shared Lane Traffic (%)								
Lane Group Flow (vph)	510	0	220	528	107	466	289	
Enter Blocked Intersection	No	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	Right	
Median Width(ft)	0					10		
Link Offset(ft)	0					0		
Crosswalk Width(ft)	8					8		
Two way Left Turn Lane								
Headway Factor	1.16	1.16	1.24	1.19	1.26	1.26	1.21	
Turning Speed (mph)	9		9	15	9		9	
Number of Detectors	1	1		1	1	1	1	
Detector Template	Left			Right				
Leading Detector (ft)	40	40		40	40	5	5	
Trailing Detector (ft)	0	0		0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	
Detector 1 Size(ft)	40	40		40	40	5	5	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel								
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	
Turn Type	NA	custom		custom	pm+pt	NA	custom	
Protected Phases	8	1		6	5	2	9	
Permitted Phases			6	2		2 8		
Detector Phase	8	1		6	5	2	2 8	
Switch Phase								
Minimum Initial (s)	7.0	5.0		10.0	5.0	10.0	1.0	

Lanes, Volumes, Timings
 14: Ann St & Broad St/5th St & Main Street

3/9/2015

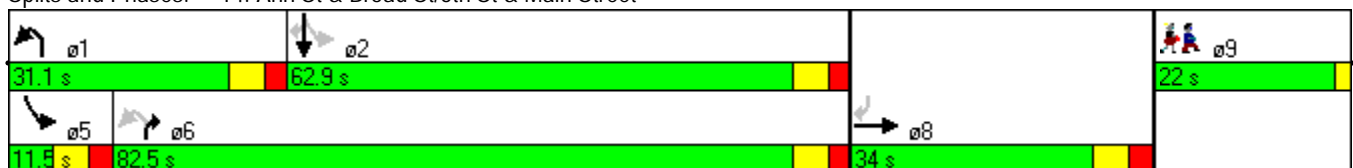


Lane Group	EBT	EBR	NBL2	NBR	SBL	SBT	SBR2	ø9
Minimum Split (s)	14.0		12.5	16.5	11.5	16.5		22.0
Total Split (s)	34.0		31.1	82.5	11.5	62.9		22.0
Total Split (%)	22.7%		20.7%	55.0%	7.7%	41.9%		15%
Maximum Green (s)	27.0		24.6	76.0	5.0	56.4		20.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0		2.0
All-Red Time (s)	3.0		2.5	2.5	2.5	2.5		0.0
Lost Time Adjust (s)	-2.5		0.0	-2.5	-2.5	-2.5		
Total Lost Time (s)	4.5		6.5	4.0	4.0	4.0		
Lead/Lag			Lead	Lag	Lead	Lag		
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		3.0
Recall Mode	None		None	None	None	C-Max		Ped
Walk Time (s)								7.0
Flash Dont Walk (s)								13.0
Pedestrian Calls (#/hr)								15
Act Effect Green (s)	28.2		88.3	79.2	76.7	68.6		98.8
Actuated g/C Ratio	0.19		0.59	0.53	0.51	0.46		0.66
v/c Ratio	0.80		0.58	0.71	0.12	0.57		0.29
Control Delay	49.3		21.5	33.8	13.9	35.1		3.1
Queue Delay	0.0		0.0	6.5	0.0	0.8		0.0
Total Delay	49.3		21.5	40.3	13.9	35.9		3.1
LOS	D		C	D	B	D		A
Approach Delay	49.3					22.2		
Approach LOS	D					C		
Queue Length 50th (ft)	204		101	386	46	333		21
Queue Length 95th (ft)	283		151	541	59	445		55
Internal Link Dist (ft)	664					218		
Turn Bay Length (ft)			190					
Base Capacity (vph)	663		441	739	896	820		1015
Starvation Cap Reductn	0		0	162	0	137		0
Spillback Cap Reductn	0		0	0	0	0		0
Storage Cap Reductn	0		0	0	0	0		0
Reduced v/c Ratio	0.77		0.50	0.92	0.12	0.68		0.28

Intersection Summary

Area Type: CBD
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 112 (75%), Referenced to phase 2:SBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 33.1
 Intersection LOS: C
 Intersection Capacity Utilization 65.6%
 ICU Level of Service C
 Analysis Period (min) 15
 * User Entered Value

Splits and Phases: 14: Ann St & Broad St/5th St & Main Street



HCM Signalized Intersection Capacity Analysis

14: Ann St & Broad St/5th St & Main Street

3/9/2015



Movement	EBT	EBR	NBL2	NBR	SBL	SBT	SBR2
Lane Configurations	↑↑		↖	↗	↖	↑	↗
Volume (vph)	353	115	200	507	87	443	263
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	10	11	10	10	11
Grade (%)	-5%			2%			
Total Lost time (s)	4.5		6.5	4.0	4.0	4.0	6.5
Lane Util. Factor	0.95		1.00	1.00	1.00	1.00	1.00
Frt	0.96		1.00	0.85	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3372		1509	1398	1752	1793	1377
Flt Permitted	1.00		0.28	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3372		452	1398	1752	1792	1377
Peak-hour factor, PHF	0.92	0.91	0.91	0.96	0.81	0.95	0.91
Adj. Flow (vph)	384	126	220	528	107	466	289
RTOR Reduction (vph)	0	0	0	0	0	0	100
Lane Group Flow (vph)	510	0	220	528	107	466	189
Heavy Vehicles (%)	0%	0%	1%	1%	3%	2%	1%
Turn Type	NA		custom	custom	pm+pt	NA	custom
Protected Phases	8		1	6	5	2	
Permitted Phases			6		2		2 8
Actuated Green, G (s)	25.7		88.8	76.7	71.7	66.1	98.3
Effective Green, g (s)	28.2		88.8	79.2	76.7	68.6	98.3
Actuated g/C Ratio	0.19		0.59	0.53	0.51	0.46	0.66
Clearance Time (s)	7.0		6.5	6.5	6.5	6.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	634		382	738	896	820	902
v/s Ratio Prot	c0.15		c0.06	c0.38	0.01	0.26	
v/s Ratio Perm			0.28		0.05		0.14
v/c Ratio	0.80		0.58	0.72	0.12	0.57	0.21
Uniform Delay, d1	58.3		19.0	26.9	19.1	29.8	10.3
Progression Factor	0.69		1.00	1.00	0.99	1.02	2.01
Incremental Delay, d2	6.4		2.1	3.3	0.1	2.8	0.1
Delay (s)	46.5		21.1	30.2	19.0	33.3	20.9
Level of Service	D		C	C	B	C	C
Approach Delay (s)	46.5					27.4	
Approach LOS	D					C	



















Intersection Summary

HCM Average Control Delay	32.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	37.0
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
 15: Seventh St & 307 EB Exit Ramp

3/9/2015

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	516	0	202	10	0	10	0	109	0	0	68	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			-5%			0%	
Storage Length (ft)	0		50	20		0	0		0	0		0
Storage Lanes	1		1	1		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850						
Flt Protected	0.950			0.950								
Satd. Flow (prot)	1770	0	1583	1770	0	1583	0	1909	0	0	1863	0
Flt Permitted	0.950			0.950								
Satd. Flow (perm)	1770	0	1583	1770	0	1583	0	1909	0	0	1863	0
Link Speed (mph)		30			30			35			25	
Link Distance (ft)		266			202			321			201	
Travel Time (s)		6.0			4.6			6.3			5.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	561	0	220	11	0	11	0	118	0	0	74	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	561	0	220	11	0	11	0	118	0	0	74	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.97	0.97	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	47.7%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings
 3: Broad St & 307 WB On Ramp/307 WB Exit Ramp

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↗	↕			↕	↗
Volume (vph)	0	0	0	120	1	440	320	327	0	0	289	470
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			-1%			0%	
Storage Length (ft)	0		0	0		50	75		0	0		50
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected					0.953		0.950					
Satd. Flow (prot)	0	0	0	0	1775	1583	1778	1872	0	0	1863	1583
Flt Permitted					0.953		0.447					
Satd. Flow (perm)	0	0	0	0	1775	1583	837	1872	0	0	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						478						320
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		283			303			238			203	
Travel Time (s)		6.4			6.9			4.6			4.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	130	1	478	348	355	0	0	314	511
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	131	478	348	355	0	0	314	511
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	0.99	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2	1	1	2			2	1
Detector Template				Left	Thru	Right	Left	Thru			Thru	Right
Leading Detector (ft)				20	100	20	20	100			100	20
Trailing Detector (ft)				0	0	0	0	0			0	0
Detector 1 Position(ft)				0	0	0	0	0			0	0
Detector 1 Size(ft)				20	6	20	20	6			6	20
Detector 1 Type				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Split	NA	Perm	pm+pt	NA			NA	Free
Protected Phases				8	8		5	2			6	
Permitted Phases						8	2					Free

Lanes, Volumes, Timings

3: Broad St & 307 WB On Ramp/307 WB Exit Ramp

3/9/2015

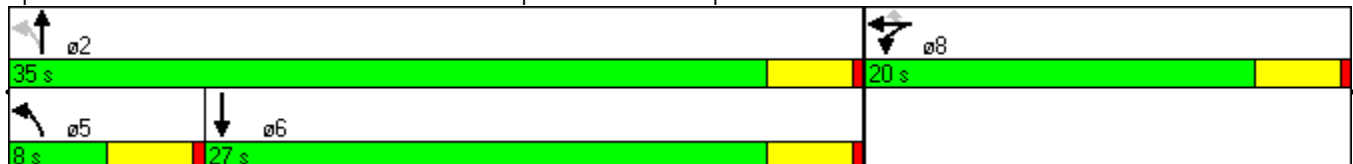


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8	8	8	5	2			6	
Switch Phase												
Minimum Initial (s)				4.0	4.0	4.0	4.0	4.0			4.0	
Minimum Split (s)				20.0	20.0	20.0	8.0	20.0			20.0	
Total Split (s)				20.0	20.0	20.0	8.0	35.0			27.0	
Total Split (%)				36.4%	36.4%	36.4%	14.5%	63.6%			49.1%	
Maximum Green (s)				16.0	16.0	16.0	4.0	31.0			23.0	
Yellow Time (s)				3.5	3.5	3.5	3.5	3.5			3.5	
All-Red Time (s)				0.5	0.5	0.5	0.5	0.5			0.5	
Lost Time Adjust (s)					0.0	0.0	0.0	0.0			0.0	
Total Lost Time (s)					4.0	4.0	4.0	4.0			4.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	
Recall Mode				None	None	None	None	C-Max			C-Max	
Act Effect Green (s)					10.5	10.5	36.5	36.5			25.2	55.0
Actuated g/C Ratio					0.19	0.19	0.66	0.66			0.46	1.00
v/c Ratio					0.39	0.69	0.51	0.29			0.37	0.32
Control Delay					21.4	8.0	8.6	5.4			12.2	0.5
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					21.4	8.0	8.6	5.4			12.2	0.5
LOS					C	A	A	A			B	A
Approach Delay					10.9			7.0			5.0	
Approach LOS					B			A			A	
Queue Length 50th (ft)					38	0	37	37			68	0
Queue Length 95th (ft)					68	57	96	96			122	0
Internal Link Dist (ft)		203			223			158			123	
Turn Bay Length (ft)						50	75					50
Base Capacity (vph)					516	799	680	1242			853	1583
Starvation Cap Reductn					0	0	0	0			0	0
Spillback Cap Reductn					0	0	0	0			0	0
Storage Cap Reductn					0	0	0	0			0	0
Reduced v/c Ratio					0.25	0.60	0.51	0.29			0.37	0.32

Intersection Summary

Area Type:	Other
Cycle Length:	55
Actuated Cycle Length:	55
Offset:	0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle:	55
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.69
Intersection Signal Delay:	7.3
Intersection LOS:	A
Intersection Capacity Utilization:	96.4%
ICU Level of Service:	F
Analysis Period (min):	15

Splits and Phases: 3: Broad St & 307 WB On Ramp/307 WB Exit Ramp



HCM Signalized Intersection Capacity Analysis

3: Broad St & 307 WB On Ramp/307 WB Exit Ramp

3/9/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↗	↗	↗		↗	↗
Volume (vph)	0	0	0	120	1	440	320	327	0	0	289	470
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			-1%			0%	
Total Lost time (s)					4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor					1.00	1.00	1.00	1.00			1.00	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					1775	1583	1778	1872			1863	1583
Flt Permitted					0.95	1.00	0.45	1.00			1.00	1.00
Satd. Flow (perm)					1775	1583	837	1872			1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	130	1	478	348	355	0	0	314	511
RTOR Reduction (vph)	0	0	0	0	0	387	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	131	91	348	355	0	0	314	511
Turn Type				Split	NA	Perm	pm+pt	NA			NA	Free
Protected Phases				8	8		5	2			6	
Permitted Phases						8	2					Free
Actuated Green, G (s)					10.5	10.5	36.5	36.5			25.2	55.0
Effective Green, g (s)					10.5	10.5	36.5	36.5			25.2	55.0
Actuated g/C Ratio					0.19	0.19	0.66	0.66			0.46	1.00
Clearance Time (s)					4.0	4.0	4.0	4.0			4.0	
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)					339	302	680	1242			854	1583
v/s Ratio Prot					0.07		c0.07	0.19			0.17	
v/s Ratio Perm						0.06	c0.27					c0.32
v/c Ratio					0.39	0.30	0.51	0.29			0.37	0.32
Uniform Delay, d1					19.4	19.1	4.4	3.8			9.7	0.0
Progression Factor					1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2					0.7	0.6	0.7	0.6			1.2	0.5
Delay (s)					20.2	19.7	5.1	4.4			10.9	0.5
Level of Service					C	B	A	A			B	A
Approach Delay (s)		0.0			19.8			4.7			4.5	
Approach LOS		A			B			A			A	



















Intersection Summary

HCM Average Control Delay	8.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	96.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Capacity Analysis
 3: Broad St & 307 WB On Ramp/307 WB Exit Ramp

3/9/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	120	1	440	320	327	0	0	289	470
Movement Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Queue, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj. Factor (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking, Bus Adj. Factors	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Sat. Flow Rate, veh/h/ln	1900	1900	1900	1863	1863	1863	1872	1872	1900	1900	1863	1863
Lanes	0	0	0	0	1	1	1	1	0	0	1	1
Lane Assignment												
Capacity, veh/h	0	0	0	336	3	302	0	1242	0	0	1236	1051
Proportion Arriving On Green	0.00	0.00	0.00	0.19	0.19	0.19	0.00	0.66	0.00	0.00	0.66	0.66
Movement Delay, s/veh	0.0	0.0	0.0	20.2	0.0	165.5	0.0	4.4	0.0	0.0	4.2	6.2
Movement LOS				C		F		A			A	A
Approach Volume, veh/h		0			514			355			825	
Approach Delay, s/veh		0.0			128.3			4.4			5.5	
Approach LOS					F			A			A	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phase			2	8			6					
Case No			4.0	11.0			7.0					
Phase Duration (G+Y+Rc), s			40.50	14.50			40.50					
Change Period (Y+Rc), s			4.00	4.00			4.00					
Max. Allowable Headway (MAH), s			4.62	4.36			4.62					
Maximum Green Setting (Gmax), s			36.50	10.50			25.20					
Max. Queue Clearance Time (g_c+l1), s			6.34	12.50			10.81					
Green Extension Time (g_e), s			6.71	0.00			5.24					
Probability of Phase Call (p_c)			1.000	1.000			1.000					
Probability of Max Out (p_x)			0.048	1.000			0.313					
Left-Turn Movement Data												
Assigned Movement				3								
Mvmt. Sat Flow, veh/h				1760.07								
Through Movement Data												
Assigned Movement			2	8			6					
Mvmt. Sat Flow, veh/h			1872.06	14.67			1862.75					
Right-Turn Movement Data												
Assigned Movement			12	18			16					
Mvmt. Sat Flow, veh/h			0.00	1583.33			1583.33					
Left Lane Group Data												
Assigned Movement		0	0	3	0	0	0	0	0			
Lane Assignment				L+T								
Lanes in Group		0	0	1	0	0	0	0	0			
Group Volume (v), veh/h		0.0	0.0	131.5	0.0	0.0	0.0	0.0	0.0			
Group Sat. Flow (s), veh/h/ln		0.0	0.0	1774.7	0.0	0.0	0.0	0.0	0.0			
Queue Serve Time (g_s), s		0.0	0.0	3.6	0.0	0.0	0.0	0.0	0.0			
Cycle Queue Clear Time (g_c), s		0.0	0.0	3.6	0.0	0.0	0.0	0.0	0.0			

HCM 2010 Signalized Intersection Capacity Analysis
 3: Broad St & 307 WB On Ramp/307 WB Exit Ramp

3/9/2015

Perm LT Sat Flow Rate (s_l), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shared LT Sat Flow (s_sh), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Eff. Green (g_p), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Que Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	36.5	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Proportion LT Inside Lane (P_L)	0.000	0.000	0.992	0.000	0.000	0.000	0.000	0.000
Lane Group Capacity (c), veh/h	0.0	0.0	338.8	0.0	0.0	0.0	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.000	0.388	0.000	0.000	0.000	0.000	0.000
Available Capacity (c_a), veh/h	0.0	0.0	338.8	0.0	0.0	0.0	0.0	0.0
Upstream Filter Factor (I)	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	0.0	19.4	0.0	0.0	0.0	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	20.2	0.0	0.0	0.0	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile bk-of-que factor (f_B%)	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00
Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Queue (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Movement	0	2	8	0	0	6	0	0
Lane Assignment	T					T		
Lanes in Group	0	1	0	0	0	1	0	0
Group Volume (v), veh/h	0.0	355.4	0.0	0.0	0.0	314.1	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	1872.1	0.0	0.0	0.0	1862.7	0.0	0.0
Queue Serve Time (g_s), s	0.0	4.3	0.0	0.0	0.0	3.8	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	4.3	0.0	0.0	0.0	3.8	0.0	0.0
Lane Group Capacity (c), veh/h	0.0	1242.4	0.0	0.0	0.0	1236.2	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.286	0.000	0.000	0.000	0.254	0.000	0.000
Available Capacity (c_a), veh/h	0.0	1242.4	0.0	0.0	0.0	1236.2	0.0	0.0
Upstream Filter Factor (I)	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	3.8	0.0	0.0	0.0	3.7	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.6	0.0	0.0	0.0	0.5	0.0	0.0
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	4.4	0.0	0.0	0.0	4.2	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.9	0.0	0.0	0.0	0.8	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.2	0.0	0.0	0.0	0.2	0.0	0.0
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile bk-of-que factor (f_B%)	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	1.1	0.0	0.0	0.0	0.9	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.14	0.00	0.00	0.00	0.17	0.00	0.00

HCM 2010 Signalized Intersection Capacity Analysis
 3: Broad St & 307 WB On Ramp/307 WB Exit Ramp

3/9/2015

Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Queue (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Movement	0	12	18	0	0	16	0	0
Lane Assignment			R			R		
Lanes in Group	0	0	1	0	0	1	0	0
Group Volume (v), veh/h	0.0	0.0	382.6	0.0	0.0	510.9	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	0.0	1583.3	0.0	0.0	1583.3	0.0	0.0
Queue Serve Time (g_s), s	0.0	0.0	10.5	0.0	0.0	8.8	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	0.0	10.5	0.0	0.0	8.8	0.0	0.0
Prot RT Sat Flow Rate (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff. Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Proportion RT Outside Lane (P_R)	0.000	0.000	1.000	0.000	0.000	1.000	0.000	0.000
Lane Group Capacity (c), veh/h	0.0	0.0	302.3	0.0	0.0	1050.8	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.000	1.266	0.000	0.000	0.486	0.000	0.000
Available Capacity (c_a), veh/h	0.0	0.0	302.3	0.0	0.0	1050.8	0.0	0.0
Upstream Filter Factor (I)	0.000	0.000	1.000	0.000	0.000	1.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	0.0	22.2	0.0	0.0	4.6	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.0	143.3	0.0	0.0	1.6	0.0	0.0
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	165.5	0.0	0.0	6.2	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.0	3.5	0.0	0.0	1.5	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.0	12.0	0.0	0.0	0.5	0.0	0.0
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile bk-of-que factor (f_B%)	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.0	15.6	0.0	0.0	2.0	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.00	7.91	0.00	0.00	1.02	0.00	0.00
Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Queue (Qe), veh	0.0	0.0	20.1	0.0	0.0	0.0	0.0	0.0
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Clear Time (tc), h	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM Average Control Delay	42.5
HCM Level of Service	D

Lanes, Volumes, Timings
6: Broad St & 307 EB On Ramp

3/9/2015


























Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	0	647	162	102	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%		-1%			0%
Storage Length (ft)	0	0		0	75	
Storage Lanes	0	0		0	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.973			
Flt Protected					0.950	
Satd. Flow (prot)	0	0	1822	0	1770	1863
Flt Permitted					0.950	
Satd. Flow (perm)	0	0	1822	0	1770	1863
Link Speed (mph)	30		35			35
Link Distance (ft)	392		180			238
Travel Time (s)	8.9		3.5			4.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	703	176	111	326
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	879	0	111	326
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	0.99	0.99	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	96.4%
ICU Level of Service	F
Analysis Period (min)	15

Lanes, Volumes, Timings
8: Dreher Ave/School Drive & Main Street

3/9/2015

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	399	64	256	559	107	42	32	158	116	32	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	14	12	11	12	14	12	14	16	14	14	12
Grade (%)		-1%			0%			1%				1%
Storage Length (ft)	145		0	125		210	85		0	105		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.980				0.850		0.872				0.902
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1337	1706	0	1525	1613	1397	1483	1521	0	1567	1488	0
Flt Permitted	0.309			0.137			0.674			0.353		
Satd. Flow (perm)	435	1706	0	220	1613	1397	1052	1521	0	582	1488	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				80		185				58
Link Speed (mph)		35			35			35				25
Link Distance (ft)		538			949			624				208
Travel Time (s)		10.5			18.5			12.2				5.7
Peak Hour Factor	0.92	0.86	0.92	0.91	0.92	0.92	0.81	0.92	0.77	0.92	0.92	0.92
Heavy Vehicles (%)	18%	4%	14%	3%	6%	11%	9%	10%	3%	10%	10%	10%
Adj. Flow (vph)	62	464	70	281	608	116	52	35	205	126	35	65
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	534	0	281	608	116	52	240	0	126	100	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			14				14
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.19	1.05	1.14	1.19	1.14	1.05	1.15	1.06	0.98	1.06	1.06	1.15
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	5	5		40	5	5	40	40		40	40	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	5	5		40	5	5	40	40		40	40	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8				4
Permitted Phases	2			6		6	8			4		
Detector Phase	2	2		1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0	10.0	7.0	7.0		7.0	7.0	

Lanes, Volumes, Timings
 8: Dreher Ave/School Drive & Main Street

3/9/2015

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0

Lanes, Volumes, Timings
8: Dreher Ave/School Drive & Main Street

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	17.0	17.0		12.0	17.0	17.0	13.0	13.0		13.0	13.0	
Total Split (s)	58.0	58.0		18.0	76.0	76.0	40.0	40.0		40.0	40.0	
Total Split (%)	38.7%	38.7%		12.0%	50.7%	50.7%	26.7%	26.7%		26.7%	26.7%	
Maximum Green (s)	51.0	51.0		11.0	69.0	69.0	34.0	34.0		34.0	34.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	0.0	-2.0	-2.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	7.0	4.0	4.0		6.0	6.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	C-Max	C-Max	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effect Green (s)	53.0	53.0		72.3	72.3	70.3	34.7	34.7		32.7	32.7	
Actuated g/C Ratio	0.35	0.35		0.48	0.48	0.47	0.23	0.23		0.22	0.22	
v/c Ratio	0.40	0.88		1.22	0.78	0.17	0.21	0.49		0.99	0.27	
Control Delay	46.3	62.1		169.5	36.5	11.3	48.6	15.9		135.5	23.7	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	46.3	62.1		169.5	36.5	11.3	48.6	15.9		135.5	23.7	
LOS	D	E		F	D	B	D	B		F	C	
Approach Delay		60.4			70.8			21.7			86.0	
Approach LOS		E			E			C			F	
Queue Length 50th (ft)	46	485		~269	323	15	41	43		123	33	
Queue Length 95th (ft)	97	#637		#460	477	m52	73	128		#260	87	
Internal Link Dist (ft)		458			869			544			128	
Turn Bay Length (ft)	145			125		210	85			105		
Base Capacity (vph)	154	607		231	778	698	252	506		132	382	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.40	0.88		1.22	0.78	0.17	0.21	0.47		0.95	0.26	

Intersection Summary

Area Type: CBD
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 58 (39%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.22
 Intersection Signal Delay: 62.7 Intersection LOS: E
 Intersection Capacity Utilization 79.9% ICU Level of Service D
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.







Lane Group	ø9
Minimum Split (s)	34.0
Total Split (s)	34.0
Total Split (%)	23%
Maximum Green (s)	32.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	25.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
 8: Dreher Ave/School Drive & Main Street

3/9/2015

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Dreher Ave/School Drive & Main Street

 ø1 18 s	 ø2 58 s	 ø4 40 s	 ø9 34 s
 ø6 76 s	 ø8 40 s		

HCM Signalized Intersection Capacity Analysis

8: Dreher Ave/School Drive & Main Street

3/9/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	399	64	256	559	107	42	32	158	116	32	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	14	12	11	12	14	12	14	16	14	14	12
Grade (%)		-1%			0%			1%				1%
Total Lost time (s)	5.0	5.0		5.0	5.0	7.0	4.0	4.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.87		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1337	1706		1525	1613	1397	1483	1521		1567	1489	
Flt Permitted	0.31	1.00		0.14	1.00	1.00	0.67	1.00		0.35	1.00	
Satd. Flow (perm)	435	1706		220	1613	1397	1053	1521		583	1489	
Peak-hour factor, PHF	0.92	0.86	0.92	0.91	0.92	0.92	0.81	0.92	0.77	0.92	0.92	0.92
Adj. Flow (vph)	62	464	70	281	608	116	52	35	205	126	35	65
RTOR Reduction (vph)	0	4	0	0	0	43	0	142	0	0	45	0
Lane Group Flow (vph)	62	530	0	281	608	73	52	98	0	126	55	0
Heavy Vehicles (%)	18%	4%	14%	3%	6%	11%	9%	10%	3%	10%	10%	10%
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	51.0	51.0		70.3	70.3	70.3	32.7	32.7		32.7	32.7	
Effective Green, g (s)	53.0	53.0		72.3	72.3	70.3	34.7	34.7		32.7	32.7	
Actuated g/C Ratio	0.35	0.35		0.48	0.48	0.47	0.23	0.23		0.22	0.22	
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	154	603		230	777	655	244	352		127	325	
v/s Ratio Prot		0.31		c0.12	0.38			0.06			0.04	
v/s Ratio Perm	0.14			c0.47		0.05	0.05			c0.22		
v/c Ratio	0.40	0.88		1.22	0.78	0.11	0.21	0.28		0.99	0.17	
Uniform Delay, d1	36.6	45.5		33.3	32.3	22.3	46.6	47.4		58.5	47.6	
Progression Factor	1.00	1.00		1.92	0.87	1.28	1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.7	16.6		130.4	7.2	0.3	0.4	0.4		77.2	0.2	
Delay (s)	44.2	62.1		194.5	35.4	28.9	47.1	47.8		135.7	47.9	
Level of Service	D	E		F	D	C	D	D		F	D	
Approach Delay (s)		60.3			79.1			47.7			96.8	
Approach LOS		E			E			D			F	

Intersection Summary

HCM Average Control Delay	71.4	HCM Level of Service	E
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	45.0
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
9: 9th St & Main Street

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕	↕		↕↕		↕	↕	
Volume (vph)	177	383	7	2	405	161	43	74	63	301	8	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	11	11	12	11	11	11	10	10	10
Grade (%)		4%			1%			5%			-2%	
Storage Length (ft)	0		0	0		0	0		0	135		0
Storage Lanes	0		0	0		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.996				0.850		0.954			0.867	
Fl _t Protected		0.981						0.989		0.950		
Satd. Flow (prot)	0	2713	0	0	1597	1252	0	1494	0	1516	1378	0
Fl _t Permitted		0.538			0.995			0.919		0.504		
Satd. Flow (perm)	0	1488	0	0	1589	1252	0	1388	0	804	1378	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25				35
Link Distance (ft)		352			552			437				1438
Travel Time (s)		7.9			5.2			11.9				4.1
Peak Hour Factor	0.57	0.85	0.35	0.50	0.81	0.77	0.77	0.64	0.72	0.91	1.00	0.55
Heavy Vehicles (%)	9%	3%	0%	0%	3%	4%	2%	3%	0%	1%	13%	0%
Parking (#/hr)		0	0			0						
Adj. Flow (vph)	311	451	20	4	500	209	56	116	88	331	8	64
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	782	0	0	504	209	0	260	0	331	72	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			10			10	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.22	1.30	1.17	1.20	1.20	1.31	1.23	1.23	1.23	1.23	1.23	1.23
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	50	40		50	5	5	50	40		40	40	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	50	40		50	5	5	50	40		40	40	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8				4
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	

Lanes, Volumes, Timings
9: 9th St & Main Street

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	9.5	14.5		14.5	14.5	14.5	13.0	13.0		13.0	13.0	
Total Split (s)	9.5	68.0		58.5	58.5	58.5	58.0	58.0		58.0	58.0	
Total Split (%)	6.3%	45.3%		39.0%	39.0%	39.0%	38.7%	38.7%		38.7%	38.7%	
Maximum Green (s)	5.0	63.5		54.0	54.0	54.0	52.0	52.0		52.0	52.0	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-0.5			-0.5	-0.5		-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0			4.0	4.0		4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		64.0			64.0	64.0		54.0		54.0	54.0	
Actuated g/C Ratio		0.43			0.43	0.43		0.36		0.36	0.36	
v/c Ratio		2.12dl			0.74	0.39		0.52		1.15	0.15	
Control Delay		143.2			35.8	26.3		42.4		141.1	33.5	
Queue Delay		0.0			3.0	0.0		0.0		0.0	0.0	
Total Delay		143.2			38.7	26.3		42.4		141.1	33.5	
LOS		F			D	C		D		F	C	
Approach Delay		143.2			35.1			42.4			121.8	
Approach LOS		F			D			D			F	
Queue Length 50th (ft)		-486			297	119		200		-378	48	
Queue Length 95th (ft)		m#562			347	152		191		#579	87	
Internal Link Dist (ft)		272			472			357			1358	
Turn Bay Length (ft)										135		
Base Capacity (vph)		635			678	534		500		289	496	
Starvation Cap Reductn		0			92	0		0		0	0	
Spillback Cap Reductn		0			0	0		0		0	0	
Storage Cap Reductn		0			0	0		0		0	0	
Reduced v/c Ratio		1.23			0.86	0.39		0.52		1.15	0.15	

Intersection Summary

Area Type:	CBD
Cycle Length:	150
Actuated Cycle Length:	150
Offset:	62 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle:	150
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.23
Intersection Signal Delay:	91.3
Intersection LOS:	F
Intersection Capacity Utilization:	84.6%
ICU Level of Service:	E
Analysis Period (min):	15
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	

Lane Group	ø9
Minimum Initial (s)	1.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	16%
Maximum Green (s)	22.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	8.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
 9: 9th St & Main Street







3/9/2015

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 9: 9th St & Main Street

 ø2 68 s	 ø4 58 s	 ø9 24 s
 ø5 9.5 s	 ø6 58.5 s	 ø8 58 s

HCM Signalized Intersection Capacity Analysis

9: 9th St & Main Street

3/9/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↔	↔		↔		↔	↔	↔
Volume (vph)	177	383	7	2	405	161	43	74	63	301	8	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	12	11	11	11	10	10	10
Grade (%)		4%			1%			5%			-2%	
Total Lost time (s)		4.0			4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor		0.95			1.00	1.00		1.00		1.00	1.00	
Frt		1.00			1.00	0.85		0.95		1.00	0.87	
Flt Protected		0.98			1.00	1.00		0.99		0.95	1.00	
Satd. Flow (prot)		2712			1597	1252		1495		1516	1377	
Flt Permitted		0.54			0.99	1.00		0.92		0.50	1.00	
Satd. Flow (perm)		1488			1589	1252		1390		805	1377	
Peak-hour factor, PHF	0.57	0.85	0.35	0.50	0.81	0.77	0.77	0.64	0.72	0.91	1.00	0.55
Adj. Flow (vph)	311	451	20	4	500	209	56	116	88	331	8	64
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	782	0	0	504	209	0	260	0	331	72	0
Heavy Vehicles (%)	9%	3%	0%	0%	3%	4%	2%	3%	0%	1%	13%	0%
Parking (#/hr)		0	0			0						
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8				4
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)		63.5			63.5	63.5		52.0		52.0	52.0	
Effective Green, g (s)		64.0			64.0	64.0		54.0		54.0	54.0	
Actuated g/C Ratio		0.43			0.43	0.43		0.36		0.36	0.36	
Clearance Time (s)		4.5			4.5	4.5		6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		635			678	534		500		290	496	
v/s Ratio Prot												0.05
v/s Ratio Perm		c0.53			0.32	0.17		0.19		c0.41		
v/c Ratio		2.12dl			0.74	0.39		0.52		1.14	0.15	
Uniform Delay, d1		43.0			36.1	29.6		37.8		48.0	32.4	
Progression Factor		0.76			0.79	0.81		1.00		1.00	1.00	
Incremental Delay, d2		112.4			6.6	2.0		1.0		96.6	0.1	
Delay (s)		145.2			35.1	25.8		38.8		144.6	32.5	
Level of Service		F			D	C		D		F	C	
Approach Delay (s)		145.2			32.4			38.8			124.6	
Approach LOS		F			C			D			F	

Intersection Summary

HCM Average Control Delay	91.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	32.0
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

Lanes, Volumes, Timings
10: 8th St & Main Street/Main Street

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕			↕↕	
Volume (vph)	44	539	22	6	351	8	65	76	35	43	19	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	13	13	13	10	10	10	10	10	10
Grade (%)		0%			0%			1%			-1%	
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993			0.996			0.968			0.931	
Flt Protected		0.996			0.999			0.984			0.984	
Satd. Flow (prot)	0	*3502	0	0	*1772	0	0	*1760	0	0	*1624	0
Flt Permitted		0.877			0.979			0.835			0.818	
Satd. Flow (perm)	0	*3021	0	0	*1733	0	0	*1405	0	0	*1397	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		552			555			340			310	
Travel Time (s)		8.5			8.2			9.3			8.5	
Peak Hour Factor	0.73	0.93	0.69	0.50	0.86	0.67	0.90	0.79	0.67	0.77	0.68	0.77
Heavy Vehicles (%)	7%	2%	5%	0%	1%	0%	3%	0%	3%	2%	0%	2%
Parking (#/hr)		0	0	0	0	0	0	0	0	0	0	0
Adj. Flow (vph)	60	580	32	12	408	12	72	96	52	56	28	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	672	0	0	432	0	0	220	0	0	172	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.19	1.27	1.19	1.10	1.25	1.10	1.26	1.43	1.26	1.24	1.24	1.24
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	5		50	5		50	40		50	40	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	50	5		50	5		50	40		50	40	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.5	14.5		14.5	14.5		12.5	12.5		12.5	12.5	
Total Split (s)	27.5	27.5		27.5	27.5		25.5	25.5		25.5	25.5	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	22.0
Total Split (s)	22.0

Lanes, Volumes, Timings
 10: 8th St & Main Street/Main Street

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	36.7%	36.7%		36.7%	36.7%		34.0%	34.0%		34.0%	34.0%	
Maximum Green (s)	23.0	23.0		23.0	23.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)		-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)		2.5			2.5			3.5			3.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		30.9			30.9			18.1			18.1	
Actuated g/C Ratio		0.41			0.41			0.24			0.24	
v/c Ratio		0.54			0.61			0.65			0.51	
Control Delay		14.7			18.5			34.4			29.4	
Queue Delay		0.0			0.1			0.0			0.0	
Total Delay		14.7			18.6			34.4			29.4	
LOS		B			B			C			C	
Approach Delay		14.7			18.6			34.4			29.4	
Approach LOS		B			B			C			C	
Queue Length 50th (ft)		170			162			91			68	
Queue Length 95th (ft)		m146			m258			128			84	
Internal Link Dist (ft)		472			475			260			230	
Turn Bay Length (ft)												
Base Capacity (vph)		1245			714			412			410	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			18			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.54			0.62			0.53			0.42	

Intersection Summary

Area Type: CBD
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 44 (59%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.65
 Intersection Signal Delay: 20.4
 Intersection LOS: C
 Intersection Capacity Utilization 63.4%
 ICU Level of Service B
 Analysis Period (min) 15
 * User Entered Value
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: 8th St & Main Street/Main Street



Lane Group	ø9
Total Split (%)	29%
Maximum Green (s)	20.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

10: 8th St & Main Street/Main Street

3/9/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔↔			↔↔			↔↔			↔↔		
Volume (vph)	44	539	22	6	351	8	65	76	35	43	19	68	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	11	11	11	13	13	13	10	10	10	10	10	10	
Grade (%)		0%			0%			1%			-1%		
Total Lost time (s)		2.5			2.5			3.5			3.5		
Lane Util. Factor		0.95			1.00			1.00			1.00		
Frt		0.99			1.00			0.97			0.93		
Flt Protected		1.00			1.00			0.98			0.98		
Satd. Flow (prot)		3502			1772			1760			1624		
Flt Permitted		0.88			0.98			0.83			0.82		
Satd. Flow (perm)		3021			1733			1405			1397		
Peak-hour factor, PHF	0.73	0.93	0.69	0.50	0.86	0.67	0.90	0.79	0.67	0.77	0.68	0.77	
Adj. Flow (vph)	60	580	32	12	408	12	72	96	52	56	28	88	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	672	0	0	432	0	0	220	0	0	172	0	
Heavy Vehicles (%)	7%	2%	5%	0%	1%	0%	3%	0%	3%	2%	0%	2%	
Parking (#/hr)		0	0	0	0	0	0	0	0	0	0	0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA		
Protected Phases		2			6			8			4		
Permitted Phases	2			6			8			4			
Actuated Green, G (s)		28.9			28.9			16.1			16.1		
Effective Green, g (s)		30.9			30.9			18.1			18.1		
Actuated g/C Ratio		0.41			0.41			0.24			0.24		
Clearance Time (s)		4.5			4.5			5.5			5.5		
Vehicle Extension (s)		3.0			3.0			3.0			3.0		
Lane Grp Cap (vph)		1245			714			339			337		
v/s Ratio Prot													
v/s Ratio Perm		0.22			0.25			0.16			0.12		
v/c Ratio		0.54			0.61			0.65			0.51		
Uniform Delay, d1		16.7			17.3			25.6			24.6		
Progression Factor		0.83			0.89			1.00			1.00		
Incremental Delay, d2		0.2			2.1			4.2			1.3		
Delay (s)		14.0			17.4			29.8			25.9		
Level of Service		B			B			C			C		
Approach Delay (s)		14.0			17.4			29.8			25.9		
Approach LOS		B			B			C			C		
Intersection Summary													
HCM Average Control Delay			18.7									HCM Level of Service	B
HCM Volume to Capacity ratio			0.62										
Actuated Cycle Length (s)			75.0									Sum of lost time (s)	26.0
Intersection Capacity Utilization			63.4%									ICU Level of Service	B
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings

11: Seventh St/7th St & Main Street /Main Street

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕			↕↕	
Volume (vph)	23	411	30	4	349	22	107	136	113	31	26	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	13	13	13	14	14	14	11	11	11
Grade (%)		-1%			2%			4%			-1%	
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.991			0.988			0.962			0.955	
Flt Protected		0.998						0.983			0.978	
Satd. Flow (prot)	0	2887	0	0	1542	0	0	1631	0	0	1394	0
Flt Permitted		0.909			0.995			0.808			0.644	
Satd. Flow (perm)	0	2629	0	0	1534	0	0	1341	0	0	918	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		555			308			456			331	
Travel Time (s)		15.1			8.4			12.4			9.0	
Peak Hour Factor	0.82	0.79	0.81	0.75	0.74	0.46	0.59	0.72	0.79	0.48	0.86	0.58
Heavy Vehicles (%)	0%	3%	1%	0%	1%	0%	4%	3%	4%	0%	1%	0%
Parking (#/hr)		0	0	0	0	0				0	0	0
Adj. Flow (vph)	28	520	37	5	472	48	181	189	143	65	30	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	585	0	0	525	0	0	513	0	0	143	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.19	1.27	1.19	1.11	1.27	1.11	1.08	1.08	1.08	1.19	1.35	1.19
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	5		50	5		50	40		50	40	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	50	5		50	5		50	40		50	40	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	15.0		15.0	15.0		12.0	12.0		12.0	12.0	
Total Split (s)	72.0	72.0		72.0	72.0		56.0	56.0		56.0	56.0	

Lanes, Volumes, Timings
 11: Seventh St/7th St & Main Street /Main Street

3/9/2015

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	22.0
Total Split (s)	22.0

Lanes, Volumes, Timings

11: Seventh St/7th St & Main Street /Main Street

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	48.0%	48.0%		48.0%	48.0%		37.3%	37.3%		37.3%	37.3%	
Maximum Green (s)	67.0	67.0		67.0	67.0		51.0	51.0		51.0	51.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)		3.0			3.0			3.0			3.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		69.0			69.0			53.0			53.0	
Actuated g/C Ratio		0.46			0.46			0.35			0.35	
v/c Ratio		0.48			0.74			1.08			0.44	
Control Delay		18.6			28.0			94.1			42.5	
Queue Delay		0.0			0.9			15.9			0.0	
Total Delay		18.6			28.9			110.0			42.5	
LOS		B			C			F			D	
Approach Delay		18.6			28.9			110.0			42.5	
Approach LOS		B			C			F			D	
Queue Length 50th (ft)		128			366			~562			107	
Queue Length 95th (ft)		144			182			#537			168	
Internal Link Dist (ft)		475			228			376			251	
Turn Bay Length (ft)												
Base Capacity (vph)		1209			706			474			324	
Starvation Cap Reductn		0			47			17			0	
Spillback Cap Reductn		6			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.49			0.80			1.12			0.44	

Intersection Summary






Area Type: CBD
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.08
 Intersection Signal Delay: 50.2 Intersection LOS: D
 Intersection Capacity Utilization 61.7% ICU Level of Service B
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Lanes, Volumes, Timings

11: Seventh St/7th St & Main Street /Main Street

3/9/2015

Splits and Phases: 11: Seventh St/7th St & Main Street /Main Street

 ø2 72 s	 ø4 56 s	 ø9 22 s
 ø6 72 s	 ø8 56 s	

Lane Group	ø9
Total Split (%)	15%
Maximum Green (s)	20.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	9.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

11: Seventh St/7th St & Main Street /Main Street

3/9/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations		↕↕			↕↕			↕↕			↕↕			
Volume (vph)	23	411	30	4	349	22	107	136	113	31	26	28		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Lane Width	11	11	11	13	13	13	14	14	14	11	11	11		
Grade (%)		-1%			2%			4%			-1%			
Total Lost time (s)		3.0			3.0			3.0			3.0			
Lane Util. Factor		0.95			1.00			1.00			1.00			
Frt		0.99			0.99			0.96			0.95			
Flt Protected		1.00			1.00			0.98			0.98			
Satd. Flow (prot)		2884			1540			1631			1393			
Flt Permitted		0.91			0.99			0.81			0.64			
Satd. Flow (perm)		2628			1533			1342			917			
Peak-hour factor, PHF	0.82	0.79	0.81	0.75	0.74	0.46	0.59	0.72	0.79	0.48	0.86	0.58		
Adj. Flow (vph)	28	520	37	5	472	48	181	189	143	65	30	48		
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0		
Lane Group Flow (vph)	0	585	0	0	525	0	0	513	0	0	143	0		
Heavy Vehicles (%)	0%	3%	1%	0%	1%	0%	4%	3%	4%	0%	1%	0%		
Parking (#/hr)		0	0	0	0	0				0	0	0		
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA			
Protected Phases		2			6			8			4			
Permitted Phases	2			6			8			4				
Actuated Green, G (s)		67.0			67.0			51.0			51.0			
Effective Green, g (s)		69.0			69.0			53.0			53.0			
Actuated g/C Ratio		0.46			0.46			0.35			0.35			
Clearance Time (s)		5.0			5.0			5.0			5.0			
Vehicle Extension (s)		3.0			3.0			3.0			3.0			
Lane Grp Cap (vph)		1209			705			474			324			
v/s Ratio Prot														
v/s Ratio Perm		0.22			0.34			0.38			0.16			
v/c Ratio		0.48			0.74			1.08			0.44			
Uniform Delay, d1		28.1			33.3			48.5			37.2			
Progression Factor		0.61			0.63			0.65			1.00			
Incremental Delay, d2		1.2			6.5			62.3			1.0			
Delay (s)		18.4			27.5			93.7			38.1			
Level of Service		B			C			F			D			
Approach Delay (s)		18.4			27.5			93.7			38.1			
Approach LOS		B			C			F			D			
Intersection Summary														
HCM Average Control Delay			44.6									HCM Level of Service	D	
HCM Volume to Capacity ratio			0.89											
Actuated Cycle Length (s)			150.0								28.0			
Intersection Capacity Utilization			61.7%										ICU Level of Service	B
Analysis Period (min)			15											
c Critical Lane Group														

Lanes, Volumes, Timings
12: Seventh St & Ann St

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕			↕			↕	
Volume (vph)	0	0	0	44	131	33	148	340	0	0	168	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	16	16	16	16	16	16	10	10	10
Grade (%)		0%			2%			-5%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.978						0.956	
Flt Protected					0.986			0.985				
Satd. Flow (prot)	0	0	0	0	1830	0	0	2138	0	0	1516	0
Flt Permitted					0.986			0.716				
Satd. Flow (perm)	0	0	0	0	1830	0	0	1554	0	0	1516	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)					7						27	
Link Speed (mph)		25			25			35			25	
Link Distance (ft)		273			284			515			456	
Travel Time (s)		7.4			7.7			10.0			12.4	
Peak Hour Factor	0.92	0.92	0.92	0.52	0.82	0.69	0.82	0.80	0.92	0.92	0.91	0.73
Heavy Vehicles (%)	0%	0%	0%	2%	1%	0%	1%	2%	0%	0%	1%	0%
Parking (#/hr)				0	0	0					0	0
Adj. Flow (vph)	0	0	0	85	160	48	180	425	0	0	185	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	293	0	0	605	0	0	273	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	0.86	0.99	0.86	0.82	0.82	0.82	1.09	1.25	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	1		1	1				1
Detector Template												
Leading Detector (ft)				50	5		50	40			40	
Trailing Detector (ft)				0	0		0	0			0	
Detector 1 Position(ft)				0	0		0	0			0	
Detector 1 Size(ft)				50	5		50	40			40	
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)				0.0	0.0		0.0	0.0			0.0	
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					6		3	8			4	
Permitted Phases				6			8					
Detector Phase				6	6		3	8			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	7.0			7.0	
Minimum Split (s)				23.0	23.0		10.5	20.5			20.5	
Total Split (s)				49.0	49.0		10.5	101.0			90.5	

Lanes, Volumes, Timings
12: Seventh St & Ann St

3/9/2015

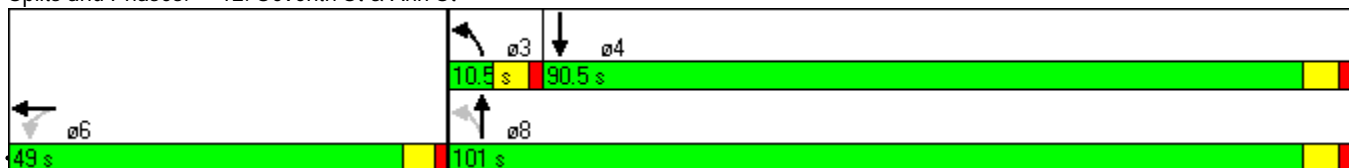


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)				32.7%	32.7%		7.0%	67.3%			60.3%	
Maximum Green (s)				44.0	44.0		5.0	95.5			85.0	
Yellow Time (s)				3.5	3.5		4.0	4.0			4.0	
All-Red Time (s)				1.5	1.5		1.5	1.5			1.5	
Lost Time Adjust (s)					-1.0			-1.0			-1.0	
Total Lost Time (s)					4.0			4.5			4.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Recall Mode				C-Max	C-Max		None	None			None	
Walk Time (s)				7.0	7.0			7.0			7.0	
Flash Dont Walk (s)				11.0	11.0			8.0			8.0	
Pedestrian Calls (#/hr)				14	14			2			2	
Act Effct Green (s)					63.3			78.2			78.2	
Actuated g/C Ratio					0.42			0.52			0.52	
v/c Ratio					0.38			0.75			0.34	
Control Delay					34.2			33.3			15.7	
Queue Delay					0.0			3.9			0.8	
Total Delay					34.2			37.2			16.5	
LOS					C			D			B	
Approach Delay					34.2			37.2			16.5	
Approach LOS					C			D			B	
Queue Length 50th (ft)					192			449			125	
Queue Length 95th (ft)					294			361			134	
Internal Link Dist (ft)		193			204			435			376	
Turn Bay Length (ft)												
Base Capacity (vph)					777			1000			904	
Starvation Cap Reductn					0			0			368	
Spillback Cap Reductn					1			303			0	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.38			0.87			0.51	

Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 115 (77%), Referenced to phase 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.75
 Intersection Signal Delay: 31.6
 Intersection LOS: C
 Intersection Capacity Utilization 61.0%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 12: Seventh St & Ann St



HCM Signalized Intersection Capacity Analysis

12: Seventh St & Ann St

3/9/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↑			↑	
Volume (vph)	0	0	0	44	131	33	148	340	0	0	168	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	16	16	16	16	16	16	10	10	10
Grade (%)		0%			2%			-5%			0%	
Total Lost time (s)					4.0			4.5			4.5	
Lane Util. Factor					1.00			1.00			1.00	
Frt					0.98			1.00			0.96	
Flt Protected					0.99			0.99			1.00	
Satd. Flow (prot)					1829			2138			1516	
Flt Permitted					0.99			0.72			1.00	
Satd. Flow (perm)					1829			1555			1516	
Peak-hour factor, PHF	0.92	0.92	0.92	0.52	0.82	0.69	0.82	0.80	0.92	0.92	0.91	0.73
Adj. Flow (vph)	0	0	0	85	160	48	180	425	0	0	185	88
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	0	0	13	0
Lane Group Flow (vph)	0	0	0	0	289	0	0	605	0	0	260	0
Heavy Vehicles (%)	0%	0%	0%	2%	1%	0%	1%	2%	0%	0%	1%	0%
Parking (#/hr)				0	0	0					0	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					6		3	8			4	
Permitted Phases				6			8					
Actuated Green, G (s)					62.3			77.2			77.2	
Effective Green, g (s)					63.3			78.2			78.2	
Actuated g/C Ratio					0.42			0.52			0.52	
Clearance Time (s)					5.0			5.5			5.5	
Vehicle Extension (s)					3.0			3.0			3.0	
Lane Grp Cap (vph)					772			811			790	
v/s Ratio Prot											0.17	
v/s Ratio Perm					0.16			0.39				
v/c Ratio					0.37			0.75			0.33	
Uniform Delay, d1					29.8			28.1			20.7	
Progression Factor					1.00			1.00			0.85	
Incremental Delay, d2					1.4			3.8			0.2	
Delay (s)					31.1			31.9			17.8	
Level of Service					C			C			B	
Approach Delay (s)		0.0			31.1			31.9			17.8	
Approach LOS		A			C			C			B	
Intersection Summary												
HCM Average Control Delay			28.4		HCM Level of Service						C	
HCM Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			150.0		Sum of lost time (s)						8.5	
Intersection Capacity Utilization			61.0%		ICU Level of Service						B	
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
13: 6th St & Main Street

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕				
Volume (vph)	27	548	19	15	344	34	44	65	61	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	16	16	16	11	11	11	12	12	12
Grade (%)		-1%			2%			-1%			0%	
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994			0.987			0.955				
Flt Protected		0.997			0.998			0.988				
Satd. Flow (prot)	0	2945	0	0	1687	0	0	1554	0	0	0	0
Flt Permitted		0.885			0.948			0.988				
Satd. Flow (perm)	0	2614	0	0	1602	0	0	1554	0	0	0	0
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)		4			5							
Link Speed (mph)		35			35			35				35
Link Distance (ft)		308			744			383				229
Travel Time (s)		6.0			14.5			7.5				4.5
Peak Hour Factor	0.61	0.90	0.68	0.63	0.83	0.71	0.79	0.68	0.80	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	2%	0%	0%	0%	0%
Parking (#/hr)		0	0	0	0	0						
Adj. Flow (vph)	44	609	28	24	414	48	56	96	76	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	681	0	0	486	0	0	228	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.19	1.27	1.19	0.99	1.13	0.99	1.19	1.19	1.19	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1				
Detector Template												
Leading Detector (ft)	50	5		50	5		50	40				
Trailing Detector (ft)	0	0		0	0		0	0				
Detector 1 Position(ft)	0	0		0	0		0	0				
Detector 1 Size(ft)	50	5		50	5		50	40				
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Turn Type	Perm	NA		Perm	NA		Perm	NA				
Protected Phases		2			6			4				
Permitted Phases	2			6			4					
Detector Phase	2	2		6	6		4	4				
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0				
Minimum Split (s)	15.0	15.0		15.0	15.0		12.0	12.0				
Total Split (s)	78.0	78.0		78.0	78.0		53.0	53.0				

Lanes, Volumes, Timings
 13: 6th St & Main Street

3/9/2015

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	19.0
Total Split (s)	19.0

Lanes, Volumes, Timings

13: 6th St & Main Street

3/9/2015

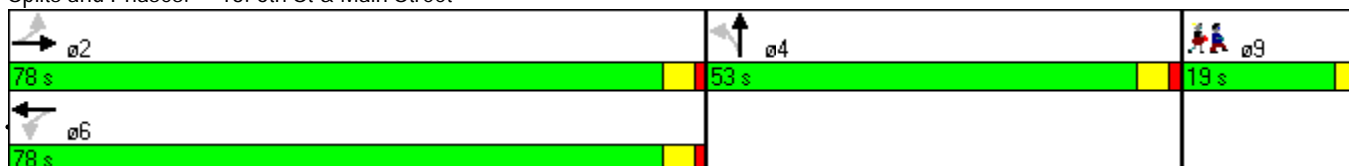


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	52.0%	52.0%		52.0%	52.0%		35.3%	35.3%				
Maximum Green (s)	73.0	73.0		73.0	73.0		48.0	48.0				
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5				
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5				
Lost Time Adjust (s)		-1.0			-1.0			-1.0				
Total Lost Time (s)		4.0			4.0			4.0				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0				
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None				
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		94.4			94.4			28.6				
Actuated g/C Ratio		0.63			0.63			0.19				
v/c Ratio		0.41			0.48			0.77				
Control Delay		8.7			18.2			74.0				
Queue Delay		0.3			0.4			0.2				
Total Delay		9.0			18.6			74.2				
LOS		A			B			E				
Approach Delay		9.0			18.6			74.2				
Approach LOS		A			B			E				
Queue Length 50th (ft)		55			258			214				
Queue Length 95th (ft)		m201			363			207				
Internal Link Dist (ft)		228			664			303			149	
Turn Bay Length (ft)												
Base Capacity (vph)		1647			1010			508				
Starvation Cap Reductn		440			161			0				
Spillback Cap Reductn		0			57			32				
Storage Cap Reductn		0			0			0				
Reduced v/c Ratio		0.56			0.57			0.48				

Intersection Summary

Area Type: CBD
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 28 (19%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 23.0
 Intersection LOS: C
 Intersection Capacity Utilization 53.4%
 ICU Level of Service A
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: 6th St & Main Street



Lane Group	ø9
Total Split (%)	13%
Maximum Green (s)	17.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	10.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

13: 6th St & Main Street

3/9/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕↕			↕↕			↕↕					
Volume (vph)	27	548	19	15	344	34	44	65	61	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	11	11	11	16	16	16	11	11	11	12	12	12	
Grade (%)		-1%			2%			-1%			0%		
Total Lost time (s)		4.0			4.0			4.0					
Lane Util. Factor		0.95			1.00			1.00					
Frt		0.99			0.99			0.95					
Flt Protected		1.00			1.00			0.99					
Satd. Flow (prot)		2944			1685			1554					
Flt Permitted		0.88			0.95			0.99					
Satd. Flow (perm)		2613			1601			1554					
Peak-hour factor, PHF	0.61	0.90	0.68	0.63	0.83	0.71	0.79	0.68	0.80	0.92	0.92	0.92	
Adj. Flow (vph)	44	609	28	24	414	48	56	96	76	0	0	0	
RTOR Reduction (vph)	0	1	0	0	2	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	680	0	0	484	0	0	228	0	0	0	0	
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	2%	0%	0%	0%	0%	
Parking (#/hr)		0	0	0	0	0							
Turn Type	Perm	NA		Perm	NA		Perm	NA					
Protected Phases		2			6			4					
Permitted Phases	2			6			4						
Actuated Green, G (s)		93.4			93.4			27.6					
Effective Green, g (s)		94.4			94.4			28.6					
Actuated g/C Ratio		0.63			0.63			0.19					
Clearance Time (s)		5.0			5.0			5.0					
Vehicle Extension (s)		3.0			3.0			3.0					
Lane Grp Cap (vph)		1644			1008			296					
v/s Ratio Prot													
v/s Ratio Perm		0.26			0.30			0.15					
v/c Ratio		0.41			0.48			0.77					
Uniform Delay, d1		13.9			14.8			57.6					
Progression Factor		0.54			1.03			1.00					
Incremental Delay, d2		0.6			1.6			11.7					
Delay (s)		8.2			16.9			69.3					
Level of Service		A			B			E					
Approach Delay (s)		8.2			16.9			69.3			0.0		
Approach LOS		A			B			E			A		
Intersection Summary													
HCM Average Control Delay			21.2									HCM Level of Service	C
HCM Volume to Capacity ratio			0.55										
Actuated Cycle Length (s)			150.0									Sum of lost time (s)	27.0
Intersection Capacity Utilization			53.4%									ICU Level of Service	A
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
 14: Ann St & Broad St/5th St & Main Street

3/9/2015



Lane Group	EBT	EBR	NBL2	NBR	SBL	SBT	SBR2	ø9
Lane Configurations	↑↑		↵	↶	↵	↑	↶	
Volume (vph)	534	84	267	601	78	639	348	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	11	10	11	10	10	11	
Grade (%)	-5%					2%		
Storage Length (ft)		0		0	0			
Storage Lanes		0		1	1			
Taper Length (ft)					25			
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	
Frt	0.979			0.850			0.850	
Flt Protected			0.950		0.950			
Satd. Flow (prot)	*3372	0	1509	1398	*1752	*1793	1377	
Flt Permitted			0.066		0.950			
Satd. Flow (perm)	*3372	0	105	1398	*1752	*1792	1377	
Right Turn on Red				No	No		Yes	
Satd. Flow (RTOR)							382	
Link Speed (mph)	25					25		
Link Distance (ft)	744					298		
Travel Time (s)	20.3					8.2		
Peak Hour Factor	0.92	0.91	0.91	0.96	0.81	0.95	0.91	
Heavy Vehicles (%)	0%	0%	1%	1%	3%	2%	1%	
Adj. Flow (vph)	580	92	293	626	96	673	382	
Shared Lane Traffic (%)								
Lane Group Flow (vph)	672	0	293	626	96	673	382	
Enter Blocked Intersection	No	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	Right	
Median Width(ft)	0					10		
Link Offset(ft)	0					0		
Crosswalk Width(ft)	8					8		
Two way Left Turn Lane								
Headway Factor	1.16	1.16	1.24	1.19	1.26	1.26	1.21	
Turning Speed (mph)		9	9	15	9		9	
Number of Detectors	1		1	1	1	1	1	
Detector Template			Left				Right	
Leading Detector (ft)	40		40	40	40	5	5	
Trailing Detector (ft)	0		0	0	0	0	0	
Detector 1 Position(ft)	0		0	0	0	0	0	
Detector 1 Size(ft)	40		40	40	40	5	5	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel								
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	NA		custom	custom	pm+pt	NA	custom	
Protected Phases	8		1	6	5	2		9
Permitted Phases			6		2		2 8	
Detector Phase	8		1	6	5	2	2 8	
Switch Phase								
Minimum Initial (s)	7.0		5.0	10.0	5.0	10.0		1.0

Lanes, Volumes, Timings
 14: Ann St & Broad St/5th St & Main Street

3/9/2015



Lane Group	EBT	EBR	NBL2	NBR	SBL	SBT	SBR2	ø9
Minimum Split (s)	14.0		12.5	16.5	11.5	16.5		22.0
Total Split (s)	40.0		27.5	76.5	11.5	60.5		22.0
Total Split (%)	26.7%		18.3%	51.0%	7.7%	40.3%		15%
Maximum Green (s)	33.0		21.0	70.0	5.0	54.0		20.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0		2.0
All-Red Time (s)	3.0		2.5	2.5	2.5	2.5		0.0
Lost Time Adjust (s)	-2.5		0.0	-2.5	-2.5	-2.5		
Total Lost Time (s)	4.5		6.5	4.0	4.0	4.0		
Lead/Lag			Lead	Lag	Lead	Lag		
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		3.0
Recall Mode	None		None	None	None	C-Max		Ped
Walk Time (s)								7.0
Flash Dont Walk (s)								13.0
Pedestrian Calls (#/hr)								15
Act Effect Green (s)	34.7		82.3	73.0	64.3	56.5	93.2	
Actuated g/C Ratio	0.23		0.55	0.49	0.43	0.38	0.62	
v/c Ratio	0.86		1.12	0.92	0.13	1.00	0.38	
Control Delay	47.0		133.4	56.3	15.8	75.2	1.9	
Queue Delay	0.0		0.0	47.8	0.0	40.0	0.0	
Total Delay	47.0		133.4	104.1	15.8	115.2	1.9	
LOS	D		F	F	B	F	A	
Approach Delay	47.0					69.3		
Approach LOS	D					E		
Queue Length 50th (ft)	273		~294	563	37	648	10	
Queue Length 95th (ft)	378		#489	#826	m49	m#843	m23	
Internal Link Dist (ft)	664					218		
Turn Bay Length (ft)			190					
Base Capacity (vph)	798		262	680	752	675	1006	
Starvation Cap Reductn	0		0	113	0	70	0	
Spillback Cap Reductn	0		0	0	0	0	0	
Storage Cap Reductn	0		0	0	0	0	0	
Reduced v/c Ratio	0.84		1.12	1.10	0.13	1.11	0.38	

Intersection Summary

Area Type: CBD
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 112 (75%), Referenced to phase 2:SBTL, Start of Yellow
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.12
 Intersection Signal Delay: 78.6
 Intersection LOS: E
 Intersection Capacity Utilization 83.6%
 ICU Level of Service E
 Analysis Period (min) 15
 * User Entered Value
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.

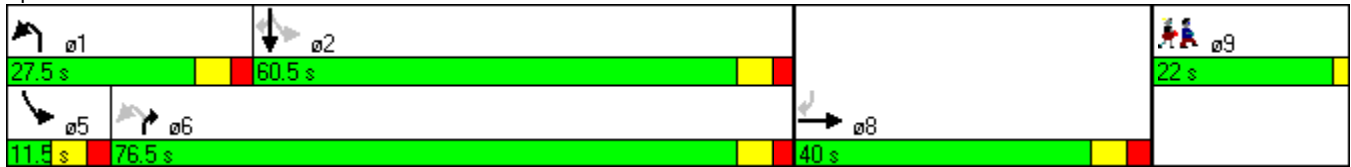
Lanes, Volumes, Timings
 14: Ann St & Broad St/5th St & Main Street

3/9/2015

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: Ann St & Broad St/5th St & Main Street



HCM Signalized Intersection Capacity Analysis

14: Ann St & Broad St/5th St & Main Street

3/9/2015



Movement	EBT	EBR	NBL2	NBR	SBL	SBT	SBR2
Lane Configurations	↑↑		↵	↵	↵	↑	↵
Volume (vph)	534	84	267	601	78	639	348
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	10	11	10	10	11
Grade (%)	-5%					2%	
Total Lost time (s)	4.5		6.5	4.0	4.0	4.0	6.5
Lane Util. Factor	0.95		1.00	1.00	1.00	1.00	1.00
Frt	0.98		1.00	0.85	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3372		1509	1398	1752	1793	1377
Flt Permitted	1.00		0.07	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3372		105	1398	1752	1792	1377
Peak-hour factor, PHF	0.92	0.91	0.91	0.96	0.81	0.95	0.91
Adj. Flow (vph)	580	92	293	626	96	673	382
RTOR Reduction (vph)	0	0	0	0	0	0	146
Lane Group Flow (vph)	672	0	293	626	96	673	236
Heavy Vehicles (%)	0%	0%	1%	1%	3%	2%	1%
Turn Type	NA		custom	custom	pm+pt	NA	custom
Protected Phases	8		1	6	5	2	
Permitted Phases			6		2		2 8
Actuated Green, G (s)	32.2		82.3	70.5	59.3	54.0	92.7
Effective Green, g (s)	34.7		82.3	73.0	64.3	56.5	92.7
Actuated g/C Ratio	0.23		0.55	0.49	0.43	0.38	0.62
Clearance Time (s)	7.0		6.5	6.5	6.5	6.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	780		262	680	751	675	851
v/s Ratio Prot	c0.20		c0.16	0.45	0.01	0.38	
v/s Ratio Perm			c0.45		0.05		0.17
v/c Ratio	0.86		1.12	0.92	0.13	1.00	0.28
Uniform Delay, d1	55.3		51.1	35.8	25.9	46.7	13.2
Progression Factor	0.64		1.00	1.00	0.92	0.94	0.91
Incremental Delay, d2	9.0		91.2	17.8	0.1	31.4	0.2
Delay (s)	44.5		142.3	53.7	23.9	75.4	12.1
Level of Service	D		F	D	C	E	B
Approach Delay (s)	44.5					50.1	
Approach LOS	D					D	



















Intersection Summary

HCM Average Control Delay	59.4	HCM Level of Service	E
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	33.0
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
 15: Seventh St & 307 EB Exit Ramp

3/9/2015

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	376	0	272	10	0	10	0	157	0	0	198	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			-5%			0%	
Storage Length (ft)	0		50	20		0	0		0	0		0
Storage Lanes	1		1	1		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850						
Flt Protected	0.950			0.950								
Satd. Flow (prot)	1770	0	1583	1770	0	1583	0	1909	0	0	1863	0
Flt Permitted	0.950			0.950								
Satd. Flow (perm)	1770	0	1583	1770	0	1583	0	1909	0	0	1863	0
Link Speed (mph)		30			30			35			25	
Link Distance (ft)		266			202			321			201	
Travel Time (s)		6.0			4.6			6.3			5.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	409	0	296	11	0	11	0	171	0	0	215	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	409	0	296	11	0	11	0	171	0	0	215	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.97	0.97	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	42.4%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings
 3: Broad St & 307 WB On Ramp/307 WB Exit Ramp

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↗	↕			↕	↗
Volume (vph)	0	0	0	76	1	318	177	389	0	0	44	296
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			-1%			0%	
Storage Length (ft)	0		0	0		50	75		0	0		50
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected					0.953		0.950					
Satd. Flow (prot)	0	0	0	0	1775	1583	1778	1872	0	0	1863	1583
Flt Permitted					0.953		0.619					
Satd. Flow (perm)	0	0	0	0	1775	1583	1159	1872	0	0	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						346						322
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		283			303			238			203	
Travel Time (s)		6.4			6.9			4.6			4.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	83	1	346	192	423	0	0	48	322
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	84	346	192	423	0	0	48	322
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	0.99	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2	1	1	2			2	1
Detector Template				Left	Thru	Right	Left	Thru			Thru	Right
Leading Detector (ft)				20	100	20	20	100			100	20
Trailing Detector (ft)				0	0	0	0	0			0	0
Detector 1 Position(ft)				0	0	0	0	0			0	0
Detector 1 Size(ft)				20	6	20	20	6			6	20
Detector 1 Type				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Split	NA	Perm	pm+pt	NA			NA	Free
Protected Phases				8	8		5	2			6	
Permitted Phases						8	2					Free

Lanes, Volumes, Timings

3: Broad St & 307 WB On Ramp/307 WB Exit Ramp

3/9/2015

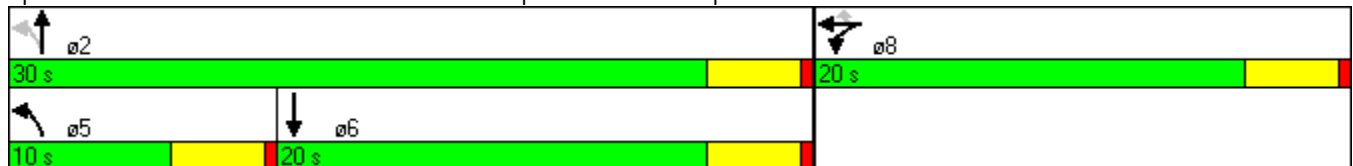


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8	8	8	5	2			6	
Switch Phase												
Minimum Initial (s)				4.0	4.0	4.0	4.0	4.0			4.0	
Minimum Split (s)				20.0	20.0	20.0	8.0	20.0			20.0	
Total Split (s)				20.0	20.0	20.0	10.0	30.0			20.0	
Total Split (%)				40.0%	40.0%	40.0%	20.0%	60.0%			40.0%	
Maximum Green (s)				16.0	16.0	16.0	6.0	26.0			16.0	
Yellow Time (s)				3.5	3.5	3.5	3.5	3.5			3.5	
All-Red Time (s)				0.5	0.5	0.5	0.5	0.5			0.5	
Lost Time Adjust (s)					0.0	0.0	0.0	0.0			0.0	
Total Lost Time (s)					4.0	4.0	4.0	4.0			4.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	
Recall Mode				None	None	None	None	C-Max			C-Max	
Act Effect Green (s)					8.9	8.9	33.1	33.1			24.0	50.0
Actuated g/C Ratio					0.18	0.18	0.66	0.66			0.48	1.00
v/c Ratio					0.27	0.61	0.22	0.34			0.05	0.20
Control Delay					18.4	7.5	4.8	5.5			10.4	0.3
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					18.4	7.5	4.8	5.5			10.4	0.3
LOS					B	A	A	A			B	A
Approach Delay					9.6			5.3			1.6	
Approach LOS					A			A			A	

Intersection Summary

Area Type:	Other
Cycle Length:	50
Actuated Cycle Length:	50
Offset:	0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle:	50
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.61
Intersection Signal Delay:	5.6
Intersection LOS:	A
Intersection Capacity Utilization:	36.5%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 3: Broad St & 307 WB On Ramp/307 WB Exit Ramp



HCM Signalized Intersection Capacity Analysis

3: Broad St & 307 WB On Ramp/307 WB Exit Ramp

3/9/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↖	↑			↕	↗
Volume (vph)	0	0	0	76	1	318	177	389	0	0	44	296
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			-1%			0%	
Total Lost time (s)					4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor					1.00	1.00	1.00	1.00			1.00	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					1775	1583	1778	1872			1863	1583
Flt Permitted					0.95	1.00	0.62	1.00			1.00	1.00
Satd. Flow (perm)					1775	1583	1159	1872			1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	83	1	346	192	423	0	0	48	322
RTOR Reduction (vph)	0	0	0	0	0	284	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	84	62	192	423	0	0	48	322
Turn Type				Split	NA	Perm	pm+pt	NA			NA	Free
Protected Phases				8	8		5	2			6	
Permitted Phases						8	2					Free
Actuated Green, G (s)					8.9	8.9	33.1	33.1			23.2	50.0
Effective Green, g (s)					8.9	8.9	33.1	33.1			23.2	50.0
Actuated g/C Ratio					0.18	0.18	0.66	0.66			0.46	1.00
Clearance Time (s)					4.0	4.0	4.0	4.0			4.0	
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)					316	282	840	1239			864	1583
v/s Ratio Prot					0.05		0.03	c0.23			0.03	
v/s Ratio Perm						0.04	0.12					c0.20
v/c Ratio					0.27	0.22	0.23	0.34			0.06	0.20
Uniform Delay, d1					17.7	17.6	3.4	3.7			7.4	0.0
Progression Factor					1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2					0.5	0.4	0.1	0.8			0.1	0.3
Delay (s)					18.2	18.0	3.5	4.4			7.5	0.3
Level of Service					B	B	A	A			A	A
Approach Delay (s)		0.0			18.0			4.2			1.2	
Approach LOS		A			B			A			A	



















Intersection Summary

HCM Average Control Delay	7.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	36.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Capacity Analysis
 3: Broad St & 307 WB On Ramp/307 WB Exit Ramp

3/9/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	76	1	318	177	389	0	0	44	296
Movement Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Queue, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj. Factor (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking, Bus Adj. Factors	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Sat. Flow Rate, veh/h/ln	1900	1900	1900	1863	1863	1863	1872	1872	1900	1900	1863	1863
Lanes	0	0	0	0	1	1	1	1	0	0	1	1
Lane Assignment												
Capacity, veh/h	0	0	0	312	4	282	0	1239	0	0	1233	1048
Proportion Arriving On Green	0.00	0.00	0.00	0.18	0.18	0.18	0.00	0.66	0.00	0.00	0.66	0.66
Movement Delay, s/veh	0.0	0.0	0.0	18.2	0.0	113.9	0.0	4.4	0.0	0.0	3.0	4.3
Movement LOS				B		F		A			A	A
Approach Volume, veh/h		0			402			423			370	
Approach Delay, s/veh		0.0			93.9			4.4			4.2	
Approach LOS					F			A			A	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phase			2	8			6					
Case No			4.0	11.0			7.0					
Phase Duration (G+Y+Rc), s			37.10	12.90			37.10					
Change Period (Y+Rc), s			4.00	4.00			4.00					
Max. Allowable Headway (MAH), s			4.67	4.31			4.67					
Maximum Green Setting (Gmax), s			33.10	8.90			24.00					
Max. Queue Clearance Time (g_c+l1), s			6.93	10.90			6.31					
Green Extension Time (g_e), s			4.15	0.00			3.75					
Probability of Phase Call (p_c)			1.000	0.996			1.000					
Probability of Max Out (p_x)			0.014	1.000			0.077					
Left-Turn Movement Data												
Assigned Movement				3								
Mvmt. Sat Flow, veh/h				1752.09								
Through Movement Data												
Assigned Movement			2	8			6					
Mvmt. Sat Flow, veh/h			1872.06	23.06			1862.75					
Right-Turn Movement Data												
Assigned Movement			12	18			16					
Mvmt. Sat Flow, veh/h			0.00	1583.33			1583.33					
Left Lane Group Data												
Assigned Movement		0	0	3	0	0	0	0	0			
Lane Assignment				L+T								
Lanes in Group		0	0	1	0	0	0	0	0			
Group Volume (v), veh/h		0.0	0.0	83.7	0.0	0.0	0.0	0.0	0.0			
Group Sat. Flow (s), veh/h/ln		0.0	0.0	1775.1	0.0	0.0	0.0	0.0	0.0			
Queue Serve Time (g_s), s		0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0			
Cycle Queue Clear Time (g_c), s		0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0			

HCM 2010 Signalized Intersection Capacity Analysis

3: Broad St & 307 WB On Ramp/307 WB Exit Ramp

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Perm LT Sat Flow Rate (s_l), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shared LT Sat Flow (s_sh), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Eff. Green (g_p), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Que Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	33.1	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Proportion LT Inside Lane (P_L)	0.000	0.000	0.987	0.000	0.000	0.000	0.000	0.000
Lane Group Capacity (c), veh/h	0.0	0.0	316.0	0.0	0.0	0.0	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.000	0.265	0.000	0.000	0.000	0.000	0.000
Available Capacity (c_a), veh/h	0.0	0.0	316.0	0.0	0.0	0.0	0.0	0.0
Upstream Filter Factor (I)	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	0.0	17.7	0.0	0.0	0.0	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	18.2	0.0	0.0	0.0	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile bk-of-que factor (f_B%)	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00
Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Queue (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Movement	0	2	8	0	0	6	0	0
Lane Assignment	T				T			
Lanes in Group	0	1	0	0	0	1	0	0
Group Volume (v), veh/h	0.0	422.8	0.0	0.0	0.0	47.8	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	1872.1	0.0	0.0	0.0	1862.7	0.0	0.0
Queue Serve Time (g_s), s	0.0	4.9	0.0	0.0	0.0	0.4	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	4.9	0.0	0.0	0.0	0.4	0.0	0.0
Lane Group Capacity (c), veh/h	0.0	1239.3	0.0	0.0	0.0	1233.1	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.341	0.000	0.000	0.000	0.039	0.000	0.000
Available Capacity (c_a), veh/h	0.0	1239.3	0.0	0.0	0.0	1233.1	0.0	0.0
Upstream Filter Factor (I)	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	3.7	0.0	0.0	0.0	2.9	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.8	0.0	0.0	0.0	0.1	0.0	0.0
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	4.4	0.0	0.0	0.0	3.0	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.9	0.0	0.0	0.0	0.1	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile bk-of-que factor (f_B%)	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	1.1	0.0	0.0	0.0	0.1	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.16	0.00	0.00	0.00	0.02	0.00	0.00

HCM 2010 Signalized Intersection Capacity Analysis
 3: Broad St & 307 WB On Ramp/307 WB Exit Ramp

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Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Queue (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data






















Assigned Movement	0	12	18	0	0	16	0	0
Lane Assignment			R			R		
Lanes in Group	0	0	1	0	0	1	0	0
Group Volume (v), veh/h	0.0	0.0	318.5	0.0	0.0	321.7	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	0.0	1583.3	0.0	0.0	1583.3	0.0	0.0
Queue Serve Time (g_s), s	0.0	0.0	8.9	0.0	0.0	4.3	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	0.0	8.9	0.0	0.0	4.3	0.0	0.0
Prot RT Sat Flow Rate (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff. Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Proportion RT Outside Lane (P_R)	0.000	0.000	1.000	0.000	0.000	1.000	0.000	0.000
Lane Group Capacity (c), veh/h	0.0	0.0	281.8	0.0	0.0	1048.2	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.000	1.130	0.000	0.000	0.307	0.000	0.000
Available Capacity (c_a), veh/h	0.0	0.0	281.8	0.0	0.0	1048.2	0.0	0.0
Upstream Filter Factor (I)	0.000	0.000	1.000	0.000	0.000	1.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	0.0	20.5	0.0	0.0	3.6	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.0	93.3	0.0	0.0	0.8	0.0	0.0
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	113.9	0.0	0.0	4.3	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.0	2.9	0.0	0.0	0.6	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.0	7.3	0.0	0.0	0.2	0.0	0.0
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile bk-of-que factor (f_B%)	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.0	10.2	0.0	0.0	0.9	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.00	5.20	0.00	0.00	0.44	0.00	0.00
Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Queue (Qe), veh	0.0	0.0	9.2	0.0	0.0	0.0	0.0	0.0
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Clear Time (tc), h	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM Average Control Delay	34.5
HCM Level of Service	C

Lanes, Volumes, Timings
8: Dreher Ave/School Drive & Main Street

3/9/2015

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	113	432	93	187	345	207	46	107	363	103	45	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	14	12	11	12	14	12	14	16	14	14	12
Grade (%)		-1%			0%			1%			1%	
Storage Length (ft)	145		0	125		210	85		0	105		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.975				0.850		0.880			0.918	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1337	1691	0	1525	1613	1397	1483	1530	0	1567	1515	0
Flt Permitted	0.434			0.103			0.687			0.122		
Satd. Flow (perm)	611	1691	0	165	1613	1397	1072	1530	0	201	1515	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				197		159			46	
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		538			949			624			208	
Travel Time (s)		10.5			18.5			12.2			5.7	
Peak Hour Factor	0.92	0.86	0.92	0.91	0.92	0.92	0.81	0.92	0.77	0.92	0.92	0.92
Heavy Vehicles (%)	18%	4%	14%	3%	6%	11%	9%	10%	3%	10%	10%	10%
Adj. Flow (vph)	123	502	101	205	375	225	57	116	471	112	49	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	123	603	0	205	375	225	57	587	0	112	108	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.19	1.05	1.14	1.19	1.14	1.05	1.15	1.06	0.98	1.06	1.06	1.15
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	5	5		40	5	5	40	40		40	40	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	5	5		40	5	5	40	40		40	40	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	2	2		1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0	10.0	7.0	7.0		7.0	7.0	

Lanes, Volumes, Timings
 8: Dreher Ave/School Drive & Main Street

3/9/2015

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0

Lanes, Volumes, Timings
 8: Dreher Ave/School Drive & Main Street

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	17.0	17.0		12.0	17.0	17.0	13.0	13.0		13.0	13.0	
Total Split (s)	39.0	39.0		15.0	54.0	54.0	62.0	62.0		62.0	62.0	
Total Split (%)	26.0%	26.0%		10.0%	36.0%	36.0%	41.3%	41.3%		41.3%	41.3%	
Maximum Green (s)	32.0	32.0		8.0	47.0	47.0	56.0	56.0		56.0	56.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	0.0	-2.0	-2.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	7.0	4.0	4.0		6.0	6.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	C-Max	C-Max	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effect Green (s)	34.0	34.0		49.0	49.0	47.0	58.0	58.0		56.0	56.0	
Actuated g/C Ratio	0.23	0.23		0.33	0.33	0.31	0.39	0.39		0.37	0.37	
v/c Ratio	0.89	1.55		1.41	0.71	0.39	0.14	0.85		1.49	0.18	
Control Delay	108.2	299.2		258.9	49.9	10.4	31.0	43.4		314.0	18.9	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	108.2	299.2		258.9	49.9	10.4	31.0	43.4		314.0	18.9	
LOS	F	F		F	D	B	C	D		F	B	
Approach Delay		266.8			92.1			42.3			169.1	
Approach LOS		F			F			D			F	

Intersection Summary

Area Type: CBD
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 58 (39%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.55
 Intersection Signal Delay: 138.7 Intersection LOS: F
 Intersection Capacity Utilization 97.1% ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 8: Dreher Ave/School Drive & Main Street



Lane Group	ø9
Minimum Split (s)	34.0
Total Split (s)	34.0
Total Split (%)	23%
Maximum Green (s)	32.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	25.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

8: Dreher Ave/School Drive & Main Street

3/9/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	113	432	93	187	345	207	46	107	363	103	45	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	14	12	11	12	14	12	14	16	14	14	12
Grade (%)		-1%			0%			1%			1%	
Total Lost time (s)	5.0	5.0		5.0	5.0	7.0	4.0	4.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.88		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1337	1691		1525	1613	1397	1483	1529		1567	1515	
Flt Permitted	0.43	1.00		0.10	1.00	1.00	0.69	1.00		0.12	1.00	
Satd. Flow (perm)	612	1691		165	1613	1397	1073	1529		202	1515	
Peak-hour factor, PHF	0.92	0.86	0.92	0.91	0.92	0.92	0.81	0.92	0.77	0.92	0.92	0.92
Adj. Flow (vph)	123	502	101	205	375	225	57	116	471	112	49	59
RTOR Reduction (vph)	0	5	0	0	0	135	0	98	0	0	29	0
Lane Group Flow (vph)	123	598	0	205	375	90	57	489	0	112	79	0
Heavy Vehicles (%)	18%	4%	14%	3%	6%	11%	9%	10%	3%	10%	10%	10%
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	32.0	32.0		47.0	47.0	47.0	56.0	56.0		56.0	56.0	
Effective Green, g (s)	34.0	34.0		49.0	49.0	47.0	58.0	58.0		56.0	56.0	
Actuated g/C Ratio	0.23	0.23		0.33	0.33	0.31	0.39	0.39		0.37	0.37	
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	139	383		145	527	438	415	591		75	566	
v/s Ratio Prot		c0.35		c0.09	0.23			0.32			0.05	
v/s Ratio Perm	0.20			0.37		0.06	0.05			c0.55		
v/c Ratio	0.88	1.56		1.41	0.71	0.20	0.14	0.83		1.49	0.14	
Uniform Delay, d1	56.1	58.0		43.6	44.3	37.8	29.8	41.5		47.0	31.1	
Progression Factor	1.00	1.00		1.30	0.93	1.13	1.00	1.00		1.00	1.00	
Incremental Delay, d2	50.4	265.5		221.4	7.8	1.0	0.2	9.3		279.7	0.1	
Delay (s)	106.5	323.5		278.2	49.1	43.8	29.9	50.8		326.7	31.2	
Level of Service	F	F		F	D	D	C	D		F	C	
Approach Delay (s)		286.7			106.0			49.0			181.6	
Approach LOS		F			F			D			F	

Intersection Summary

HCM Average Control Delay	152.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.51		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	50.0
Intersection Capacity Utilization	97.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
9: 9th St & Main Street

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕	↕		↕↕		↕	↕	
Volume (vph)	150	438	14	1	263	133	29	56	49	256	6	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	11	11	12	11	11	11	10	10	10
Grade (%)		4%			1%			5%			-2%	
Storage Length (ft)	0		0	0		0	0		0	135		0
Storage Lanes	0		0	0		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993				0.850		0.953			0.861	
Flt Protected		0.984						0.990		0.950		
Satd. Flow (prot)	0	2727	0	0	1597	1252	0	1494	0	1516	1375	0
Flt Permitted		0.658			0.997			0.931		0.552		
Satd. Flow (perm)	0	1823	0	0	1592	1252	0	1405	0	881	1375	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			35	
Link Distance (ft)		352			552			437			1438	
Travel Time (s)		7.9			5.2			11.9			4.1	
Peak Hour Factor	0.57	0.85	0.35	0.50	0.81	0.77	0.77	0.64	0.72	0.91	1.00	0.55
Heavy Vehicles (%)	9%	3%	0%	0%	3%	4%	2%	3%	0%	1%	13%	0%
Parking (#/hr)		0	0			0						
Adj. Flow (vph)	263	515	40	2	325	173	38	88	68	281	6	75
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	818	0	0	327	173	0	194	0	281	81	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			10			10	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.22	1.30	1.17	1.20	1.20	1.31	1.23	1.23	1.23	1.23	1.23	1.23
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	50	40		50	5	5	50	40		40	40	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	50	40		50	5	5	50	40		40	40	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8				4
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	

Lanes, Volumes, Timings
9: 9th St & Main Street

3/9/2015

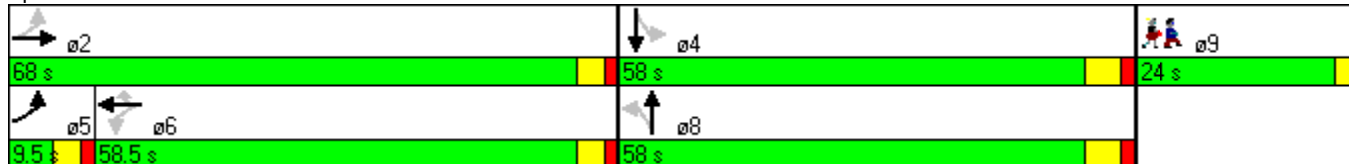


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	9.5	14.5		14.5	14.5	14.5	13.0	13.0		13.0	13.0	
Total Split (s)	9.5	68.0		58.5	58.5	58.5	58.0	58.0		58.0	58.0	
Total Split (%)	6.3%	45.3%		39.0%	39.0%	39.0%	38.7%	38.7%		38.7%	38.7%	
Maximum Green (s)	5.0	63.5		54.0	54.0	54.0	52.0	52.0		52.0	52.0	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-0.5			-0.5	-0.5		-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0			4.0	4.0		4.0		4.0	4.0	
Lead/Lag	Lead			Lag			Lag					
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		67.3			67.3	67.3		50.7		50.7	50.7	
Actuated g/C Ratio		0.45			0.45	0.45		0.34		0.34	0.34	
v/c Ratio		1.00			0.46	0.31		0.41		0.95	0.17	
Control Delay		58.2			20.7	19.4		40.3		87.6	34.8	
Queue Delay		0.0			0.5	0.0		0.0		0.0	0.0	
Total Delay		58.2			21.2	19.4		40.3		87.6	34.8	
LOS		E			C	B		D		F	C	
Approach Delay		58.2			20.5			40.3			75.8	
Approach LOS		E			C			D			E	

Intersection Summary

Area Type:	CBD
Cycle Length:	150
Actuated Cycle Length:	150
Offset:	62 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle:	140
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.00
Intersection Signal Delay:	49.7
Intersection LOS:	D
Intersection Capacity Utilization:	66.7%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 9: 9th St & Main Street



Lane Group	ø9
Minimum Initial (s)	1.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	16%
Maximum Green (s)	22.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	8.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

9: 9th St & Main Street

3/9/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕	↕		↕↕		↕	↕	
Volume (vph)	150	438	14	1	263	133	29	56	49	256	6	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	12	11	11	11	10	10	10
Grade (%)		4%			1%			5%				-2%
Total Lost time (s)		4.0			4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor		0.95			1.00	1.00		1.00		1.00	1.00	
Frt		0.99			1.00	0.85		0.95		1.00	0.86	
Flt Protected		0.98			1.00	1.00		0.99		0.95	1.00	
Satd. Flow (prot)		2726			1597	1252		1494		1516	1375	
Flt Permitted		0.66			1.00	1.00		0.93		0.55	1.00	
Satd. Flow (perm)		1822			1592	1252		1405		881	1375	
Peak-hour factor, PHF	0.57	0.85	0.35	0.50	0.81	0.77	0.77	0.64	0.72	0.91	1.00	0.55
Adj. Flow (vph)	263	515	40	2	325	173	38	88	68	281	6	75
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	818	0	0	327	173	0	194	0	281	81	0
Heavy Vehicles (%)	9%	3%	0%	0%	3%	4%	2%	3%	0%	1%	13%	0%
Parking (#/hr)		0	0			0						
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8				4
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)		66.8			66.8	66.8		48.7		48.7	48.7	
Effective Green, g (s)		67.3			67.3	67.3		50.7		50.7	50.7	
Actuated g/C Ratio		0.45			0.45	0.45		0.34		0.34	0.34	
Clearance Time (s)		4.5			4.5	4.5		6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		817			714	562		475		298	465	
v/s Ratio Prot												0.06
v/s Ratio Perm		c0.45			0.21	0.14		0.14		c0.32		
v/c Ratio		1.00			0.46	0.31		0.41		0.94	0.17	
Uniform Delay, d1		41.4			28.7	26.5		38.1		48.2	34.9	
Progression Factor		1.21			0.62	0.65		1.00		1.00	1.00	
Incremental Delay, d2		9.7			1.8	1.2		0.6		37.0	0.2	
Delay (s)		59.8			19.7	18.3		38.7		85.2	35.1	
Level of Service		E			B	B		D		F	D	
Approach Delay (s)		59.8			19.3			38.7			74.0	
Approach LOS		E			B			D			E	

Intersection Summary

HCM Average Control Delay	49.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	32.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
10: 8th St & Main Street/Main Street

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕			↕↕	
Volume (vph)	45	640	39	8	326	14	65	47	40	56	19	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	13	13	13	10	10	10	10	10	10
Grade (%)		0%			0%			1%			-1%	
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.989			0.993			0.958			0.954	
Flt Protected		0.996			0.998			0.982			0.977	
Satd. Flow (prot)	0	*3502	0	0	*1772	0	0	*1760	0	0	*1624	0
Flt Permitted		0.891			0.963			0.831			0.748	
Satd. Flow (perm)	0	*3021	0	0	*1733	0	0	*1405	0	0	*1397	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		552			555			340			310	
Travel Time (s)		8.5			8.2			9.3			8.5	
Peak Hour Factor	0.73	0.93	0.69	0.50	0.86	0.67	0.90	0.79	0.67	0.77	0.68	0.77
Heavy Vehicles (%)	7%	2%	5%	0%	1%	0%	3%	0%	3%	2%	0%	2%
Parking (#/hr)		0	0	0	0	0	0	0	0	0	0	0
Adj. Flow (vph)	62	688	57	16	379	21	72	59	60	73	28	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	807	0	0	416	0	0	191	0	0	153	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.19	1.27	1.19	1.10	1.25	1.10	1.26	1.43	1.26	1.24	1.24	1.24
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	5		50	5		50	40		50	40	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	50	5		50	5		50	40		50	40	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.5	14.5		14.5	14.5		12.5	12.5		12.5	12.5	
Total Split (s)	27.5	27.5		27.5	27.5		25.5	25.5		25.5	25.5	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	22.0
Total Split (s)	22.0

Lanes, Volumes, Timings
 10: 8th St & Main Street/Main Street

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	36.7%	36.7%		36.7%	36.7%		34.0%	34.0%		34.0%	34.0%	
Maximum Green (s)	23.0	23.0		23.0	23.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)		-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)		2.5			2.5			3.5			3.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		32.0			32.0			17.0			17.0	
Actuated g/C Ratio		0.43			0.43			0.23			0.23	
v/c Ratio		0.63			0.56			0.60			0.48	
Control Delay		16.0			21.0			33.3			29.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		16.0			21.0			33.3			29.4	
LOS		B			C			C			C	
Approach Delay		16.0			21.0			33.3			29.4	
Approach LOS		B			C			C			C	

Intersection Summary

Area Type: CBD
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 44 (59%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.63
 Intersection Signal Delay: 20.7
 Intersection LOS: C
 Intersection Capacity Utilization 60.4%
 ICU Level of Service B
 Analysis Period (min) 15
 * User Entered Value

Splits and Phases: 10: 8th St & Main Street/Main Street



Lane Group	ø9
Total Split (%)	29%
Maximum Green (s)	20.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

10: 8th St & Main Street/Main Street

3/9/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕			↕↕	
Volume (vph)	45	640	39	8	326	14	65	47	40	56	19	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	13	13	13	10	10	10	10	10	10
Grade (%)		0%			0%			1%			-1%	
Total Lost time (s)		2.5			2.5			3.5			3.5	
Lane Util. Factor		0.95			1.00			1.00			1.00	
Frt		0.99			0.99			0.96			0.95	
Flt Protected		1.00			1.00			0.98			0.98	
Satd. Flow (prot)		3502			1772			1760			1624	
Flt Permitted		0.89			0.96			0.83			0.75	
Satd. Flow (perm)		3021			1733			1405			1397	
Peak-hour factor, PHF	0.73	0.93	0.69	0.50	0.86	0.67	0.90	0.79	0.67	0.77	0.68	0.77
Adj. Flow (vph)	62	688	57	16	379	21	72	59	60	73	28	52
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	807	0	0	416	0	0	191	0	0	153	0
Heavy Vehicles (%)	7%	2%	5%	0%	1%	0%	3%	0%	3%	2%	0%	2%
Parking (#/hr)		0	0	0	0	0	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		30.0			30.0			15.0			15.0	
Effective Green, g (s)		32.0			32.0			17.0			17.0	
Actuated g/C Ratio		0.43			0.43			0.23			0.23	
Clearance Time (s)		4.5			4.5			5.5			5.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1289			739			318			317	
v/s Ratio Prot												
v/s Ratio Perm		c0.27			0.24			c0.14			0.11	
v/c Ratio		0.63			0.56			0.60			0.48	
Uniform Delay, d1		16.8			16.2			26.0			25.2	
Progression Factor		0.85			1.19			1.00			1.00	
Incremental Delay, d2		0.9			0.3			3.2			1.2	
Delay (s)		15.2			19.5			29.1			26.3	
Level of Service		B			B			C			C	
Approach Delay (s)		15.2			19.5			29.1			26.3	
Approach LOS		B			B			C			C	

Intersection Summary

HCM Average Control Delay	19.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
 11: Seventh St/7th St & Main Street /Main Street

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕			↕↕	
Volume (vph)	17	415	212	35	261	13	158	105	138	37	129	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	13	13	13	14	14	14	11	11	11
Grade (%)		-1%			2%			4%			-1%	
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.951			0.991			0.960			0.974	
Flt Protected		0.999			0.995			0.978			0.986	
Satd. Flow (prot)	0	2785	0	0	1540	0	0	1618	0	0	1428	0
Flt Permitted		0.936			0.635			0.672			0.755	
Satd. Flow (perm)	0	2610	0	0	983	0	0	1111	0	0	1094	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		555			308			456			331	
Travel Time (s)		15.1			8.4			12.4			9.0	
Peak Hour Factor	0.82	0.79	0.81	0.75	0.74	0.46	0.59	0.72	0.79	0.48	0.86	0.58
Heavy Vehicles (%)	0%	3%	1%	0%	1%	0%	4%	3%	4%	0%	1%	0%
Parking (#/hr)		0	0	0	0	0				0	0	0
Adj. Flow (vph)	21	525	262	47	353	28	268	146	175	77	150	53
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	808	0	0	428	0	0	589	0	0	280	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.19	1.27	1.19	1.11	1.27	1.11	1.08	1.08	1.08	1.19	1.35	1.19
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	5		50	5		50	40		50	40	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	50	5		50	5		50	40		50	40	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	15.0		15.0	15.0		12.0	12.0		12.0	12.0	
Total Split (s)	59.0	59.0		59.0	59.0		69.0	69.0		69.0	69.0	

Lanes, Volumes, Timings
 11: Seventh St/7th St & Main Street /Main Street

3/9/2015

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	22.0
Total Split (s)	22.0

Lanes, Volumes, Timings

11: Seventh St/7th St & Main Street /Main Street

3/9/2015

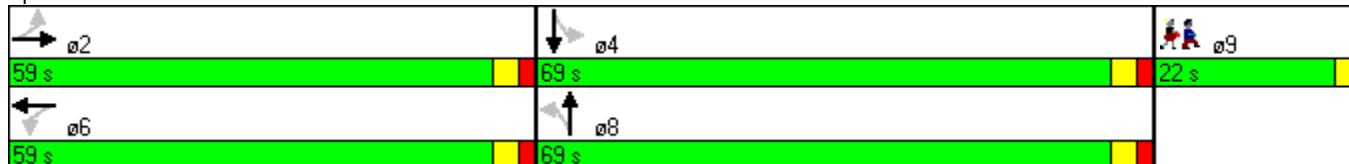


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	39.3%	39.3%		39.3%	39.3%		46.0%	46.0%		46.0%	46.0%	
Maximum Green (s)	54.0	54.0		54.0	54.0		64.0	64.0		64.0	64.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)		3.0			3.0			3.0			3.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		56.0			56.0			66.0			66.0	
Actuated g/C Ratio		0.37			0.37			0.44			0.44	
v/c Ratio		0.83			1.17			1.20			0.58	
Control Delay		39.4			136.4			128.1			37.6	
Queue Delay		0.9			0.0			9.8			0.0	
Total Delay		40.3			136.4			137.9			37.6	
LOS		D			F			F			D	
Approach Delay		40.3			136.4			137.9			37.6	
Approach LOS		D			F			F			D	

Intersection Summary

Area Type: CBD
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.20
 Intersection Signal Delay: 86.8
 Intersection LOS: F
 Intersection Capacity Utilization 89.6%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 11: Seventh St/7th St & Main Street /Main Street



Lanes, Volumes, Timings
11: Seventh St/7th St & Main Street /Main Street

3/9/2015

Lane Group	ø9
Total Split (%)	15%
Maximum Green (s)	20.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	9.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

11: Seventh St/7th St & Main Street /Main Street

3/9/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕			↕↕	
Volume (vph)	17	415	212	35	261	13	158	105	138	37	129	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	13	13	13	14	14	14	11	11	11
Grade (%)		-1%			2%			4%			-1%	
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		0.95			1.00			1.00			1.00	
Frt		0.95			0.99			0.96			0.97	
Flt Protected		1.00			0.99			0.98			0.99	
Satd. Flow (prot)		2786			1539			1617			1430	
Flt Permitted		0.94			0.64			0.67			0.75	
Satd. Flow (perm)		2610			983			1112			1094	
Peak-hour factor, PHF	0.82	0.79	0.81	0.75	0.74	0.46	0.59	0.72	0.79	0.48	0.86	0.58
Adj. Flow (vph)	21	525	262	47	353	28	268	146	175	77	150	53
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	808	0	0	428	0	0	589	0	0	280	0
Heavy Vehicles (%)	0%	3%	1%	0%	1%	0%	4%	3%	4%	0%	1%	0%
Parking (#/hr)		0	0	0	0	0				0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		54.0			54.0			64.0			64.0	
Effective Green, g (s)		56.0			56.0			66.0			66.0	
Actuated g/C Ratio		0.37			0.37			0.44			0.44	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		974			367			489			481	
v/s Ratio Prot												
v/s Ratio Perm		0.31			0.44			0.53			0.26	
v/c Ratio		0.83			1.17			1.20			0.58	
Uniform Delay, d1		42.7			47.0			42.0			31.6	
Progression Factor		0.76			0.84			0.58			1.00	
Incremental Delay, d2		6.7			99.8			102.4			1.8	
Delay (s)		38.9			139.5			126.9			33.4	
Level of Service		D			F			F			C	
Approach Delay (s)		38.9			139.5			126.9			33.4	
Approach LOS		D			F			F			C	

Intersection Summary

HCM Average Control Delay	83.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	89.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
12: Seventh St & Ann St

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕			↕			↕	
Volume (vph)	0	0	0	13	133	21	155	469	0	0	376	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	16	16	16	16	16	16	10	10	10
Grade (%)		0%			2%			-5%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.981						0.983	
Flt Protected					0.994			0.988				
Satd. Flow (prot)	0	0	0	0	1853	0	0	2143	0	0	1555	0
Flt Permitted					0.994			0.653				
Satd. Flow (perm)	0	0	0	0	1853	0	0	1416	0	0	1555	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)					6						8	
Link Speed (mph)		25			25			35			25	
Link Distance (ft)		273			284			344			456	
Travel Time (s)		7.4			7.7			6.7			12.4	
Peak Hour Factor	0.92	0.92	0.92	0.52	0.82	0.69	0.82	0.80	0.92	0.92	0.91	0.73
Heavy Vehicles (%)	0%	0%	0%	2%	1%	0%	1%	2%	0%	0%	1%	0%
Parking (#/hr)				0	0	0					0	0
Adj. Flow (vph)	0	0	0	25	162	30	189	586	0	0	413	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	217	0	0	775	0	0	471	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	0.86	0.99	0.86	0.82	0.82	0.82	1.09	1.25	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	1		1	1				1
Detector Template												
Leading Detector (ft)				50	5		50	40			40	
Trailing Detector (ft)				0	0		0	0			0	
Detector 1 Position(ft)				0	0		0	0			0	
Detector 1 Size(ft)				50	5		50	40			40	
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)				0.0	0.0		0.0	0.0			0.0	
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					6		3	8			4	
Permitted Phases				6			8					
Detector Phase				6	6		3	8			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	7.0			7.0	
Minimum Split (s)				23.0	23.0		10.5	20.5			20.5	
Total Split (s)				49.0	49.0		10.5	101.0			90.5	

Lanes, Volumes, Timings
12: Seventh St & Ann St

3/9/2015

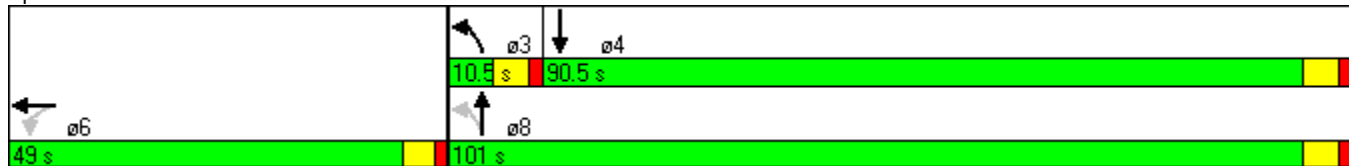


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)				32.7%	32.7%		7.0%	67.3%			60.3%	
Maximum Green (s)				44.0	44.0		5.0	95.5			85.0	
Yellow Time (s)				3.5	3.5		4.0	4.0			4.0	
All-Red Time (s)				1.5	1.5		1.5	1.5			1.5	
Lost Time Adjust (s)					-1.0			-1.0			-1.0	
Total Lost Time (s)					4.0			4.5			4.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Recall Mode				C-Max	C-Max		None	None			None	
Walk Time (s)				7.0	7.0			7.0			7.0	
Flash Dont Walk (s)				11.0	11.0			8.0			8.0	
Pedestrian Calls (#/hr)				14	14			2			2	
Act Effect Green (s)					45.0			96.5			96.5	
Actuated g/C Ratio					0.30			0.64			0.64	
v/c Ratio					0.39			0.85			0.47	
Control Delay					42.9			32.1			6.2	
Queue Delay					0.0			103.0			2.3	
Total Delay					42.9			135.1			8.4	
LOS					D			F			A	
Approach Delay					42.9			135.1			8.4	
Approach LOS					D			F			A	

Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 115 (77%), Referenced to phase 6:WBTL, Start of Yellow
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.85
 Intersection Signal Delay: 80.7
 Intersection Capacity Utilization 75.4%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service D

Splits and Phases: 12: Seventh St & Ann St



HCM Signalized Intersection Capacity Analysis

12: Seventh St & Ann St

3/9/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↔			↑			↑		
Volume (vph)	0	0	0	13	133	21	155	469	0	0	376	42	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	12	12	12	16	16	16	16	16	16	10	10	10	
Grade (%)		0%			2%			-5%			0%		
Total Lost time (s)					4.0			4.5			4.5		
Lane Util. Factor					1.00			1.00			1.00		
Fr _t					0.98			1.00			0.98		
Fl _t Protected					0.99			0.99			1.00		
Satd. Flow (prot)					1854			2143			1556		
Fl _t Permitted					0.99			0.65			1.00		
Satd. Flow (perm)					1854			1417			1556		
Peak-hour factor, PHF	0.92	0.92	0.92	0.52	0.82	0.69	0.82	0.80	0.92	0.92	0.91	0.73	
Adj. Flow (vph)	0	0	0	25	162	30	189	586	0	0	413	58	
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	0	0	3	0	
Lane Group Flow (vph)	0	0	0	0	213	0	0	775	0	0	468	0	
Heavy Vehicles (%)	0%	0%	0%	2%	1%	0%	1%	2%	0%	0%	1%	0%	
Parking (#/hr)				0	0	0					0	0	
Turn Type				Perm	NA		pm+pt	NA			NA		
Protected Phases					6		3	8			4		
Permitted Phases				6			8						
Actuated Green, G (s)					44.0			95.5			95.5		
Effective Green, g (s)					45.0			96.5			96.5		
Actuated g/C Ratio					0.30			0.64			0.64		
Clearance Time (s)					5.0			5.5			5.5		
Vehicle Extension (s)					3.0			3.0			3.0		
Lane Grp Cap (vph)					556			912			1001		
v/s Ratio Prot											0.30		
v/s Ratio Perm					0.11			c0.55					
v/c Ratio					0.38			0.85			0.47		
Uniform Delay, d ₁					41.5			21.0			13.6		
Progression Factor					1.00			1.00			0.38		
Incremental Delay, d ₂					2.0			7.5			0.2		
Delay (s)					43.5			28.5			5.4		
Level of Service					D			C			A		
Approach Delay (s)		0.0			43.5			28.5			5.4		
Approach LOS		A			D			C			A		
Intersection Summary													
HCM Average Control Delay			23.3		HCM Level of Service						C		
HCM Volume to Capacity ratio			0.70										
Actuated Cycle Length (s)			150.0		Sum of lost time (s)						8.5		
Intersection Capacity Utilization			75.4%		ICU Level of Service						D		
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
13: 6th St & Main Street

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕				
Volume (vph)	104	504	14	8	278	45	10	69	36	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	16	16	16	11	11	11	12	12	12
Grade (%)		-1%			2%			-1%			0%	
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.979			0.962				
Flt Protected		0.989			0.998			0.996				
Satd. Flow (prot)	0	2932	0	0	1673	0	0	1572	0	0	0	0
Flt Permitted		0.725			0.970			0.996				
Satd. Flow (perm)	0	2149	0	0	1627	0	0	1572	0	0	0	0
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)		3			9							
Link Speed (mph)		35			35			35				35
Link Distance (ft)		308			744			383				229
Travel Time (s)		6.0			14.5			7.5				4.5
Peak Hour Factor	0.61	0.90	0.68	0.63	0.83	0.71	0.79	0.68	0.80	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	2%	0%	0%	0%	0%
Parking (#/hr)		0	0	0	0	0						
Adj. Flow (vph)	170	560	21	13	335	63	13	101	45	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	751	0	0	411	0	0	159	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.19	1.27	1.19	0.99	1.13	0.99	1.19	1.19	1.19	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1				
Detector Template												
Leading Detector (ft)	50	5		50	5		50	40				
Trailing Detector (ft)	0	0		0	0		0	0				
Detector 1 Position(ft)	0	0		0	0		0	0				
Detector 1 Size(ft)	50	5		50	5		50	40				
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Turn Type	Perm	NA		Perm	NA		Perm	NA				
Protected Phases		2			6			4				
Permitted Phases	2			6			4					
Detector Phase	2	2		6	6		4	4				
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0				
Minimum Split (s)	15.0	15.0		15.0	15.0		12.0	12.0				
Total Split (s)	78.0	78.0		78.0	78.0		53.0	53.0				

Lanes, Volumes, Timings
 13: 6th St & Main Street

3/9/2015

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	19.0
Total Split (s)	19.0

Lanes, Volumes, Timings
13: 6th St & Main Street

3/9/2015

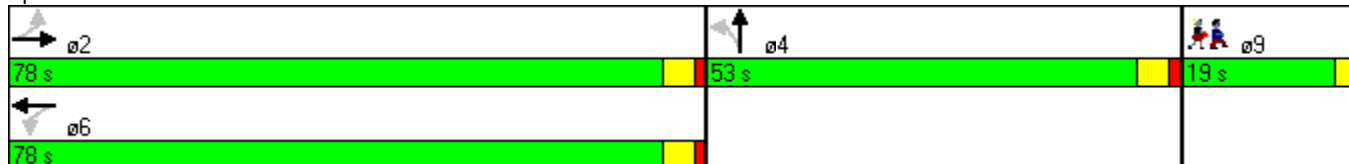


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	52.0%	52.0%		52.0%	52.0%		35.3%	35.3%				
Maximum Green (s)	73.0	73.0		73.0	73.0		48.0	48.0				
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5				
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5				
Lost Time Adjust (s)		-1.0			-1.0			-1.0				
Total Lost Time (s)		4.0			4.0			4.0				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0				
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None				
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		101.3			101.3			21.7				
Actuated g/C Ratio		0.68			0.68			0.14				
v/c Ratio		0.52			0.37			0.70				
Control Delay		7.7			12.2			76.5				
Queue Delay		0.8			0.6			0.0				
Total Delay		8.5			12.8			76.5				
LOS		A			B			E				
Approach Delay		8.5			12.8			76.5				
Approach LOS		A			B			E				

Intersection Summary

Area Type:	CBD
Cycle Length:	150
Actuated Cycle Length:	150
Offset:	28 (19%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.70
Intersection Signal Delay:	18.1
Intersection LOS:	B
Intersection Capacity Utilization	56.2%
ICU Level of Service	B
Analysis Period (min)	15

Splits and Phases: 13: 6th St & Main Street



Lane Group	ø9
Total Split (%)	13%
Maximum Green (s)	17.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	10.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

13: 6th St & Main Street

3/9/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕↕			↕↕			↕↕					
Volume (vph)	104	504	14	8	278	45	10	69	36	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	11	11	11	16	16	16	11	11	11	12	12	12	
Grade (%)		-1%			2%			-1%			0%		
Total Lost time (s)		4.0			4.0			4.0					
Lane Util. Factor		0.95			1.00			1.00					
Frt		1.00			0.98			0.96					
Flt Protected		0.99			1.00			1.00					
Satd. Flow (prot)		2931			1675			1571					
Flt Permitted		0.72			0.97			1.00					
Satd. Flow (perm)		2148			1627			1571					
Peak-hour factor, PHF	0.61	0.90	0.68	0.63	0.83	0.71	0.79	0.68	0.80	0.92	0.92	0.92	
Adj. Flow (vph)	170	560	21	13	335	63	13	101	45	0	0	0	
RTOR Reduction (vph)	0	1	0	0	3	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	750	0	0	408	0	0	159	0	0	0	0	
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	2%	0%	0%	0%	0%	
Parking (#/hr)		0	0	0	0	0							
Turn Type	Perm	NA		Perm	NA		Perm	NA					
Protected Phases		2			6			4					
Permitted Phases	2			6			4						
Actuated Green, G (s)		100.3			100.3			20.7					
Effective Green, g (s)		101.3			101.3			21.7					
Actuated g/C Ratio		0.68			0.68			0.14					
Clearance Time (s)		5.0			5.0			5.0					
Vehicle Extension (s)		3.0			3.0			3.0					
Lane Grp Cap (vph)		1451			1099			227					
v/s Ratio Prot													
v/s Ratio Perm		0.35			0.25			0.10					
v/c Ratio		0.52			0.37			0.70					
Uniform Delay, d1		12.1			10.6			61.1					
Progression Factor		0.54			1.00			1.00					
Incremental Delay, d2		0.6			1.0			9.4					
Delay (s)		7.2			11.5			70.4					
Level of Service		A			B			E					
Approach Delay (s)		7.2			11.5			70.4			0.0		
Approach LOS		A			B			E			A		
Intersection Summary													
HCM Average Control Delay			16.1									HCM Level of Service	B
HCM Volume to Capacity ratio			0.55										
Actuated Cycle Length (s)			150.0									Sum of lost time (s)	27.0
Intersection Capacity Utilization			56.2%									ICU Level of Service	B
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
 14: Ann St & Broad St/5th St & Main Street

3/9/2015

	→	↘	↙	↗	↘	↓	↙	
Lane Group	EBT	EBR	NBL2	NBR	SBL	SBT	SBR2	ø9
Lane Configurations	↑↑		↙	↗	↘	↑	↗	
Volume (vph)	400	32	220	560	87	438	263	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	11	10	11	10	10	11	
Grade (%)	-5%					2%		
Storage Length (ft)	0		0		0			
Storage Lanes	0		1		1			
Taper Length (ft)						25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	
Frt	0.989		0.850		0.850			
Flt Protected			0.950		0.950			
Satd. Flow (prot)	*3372	0	1509	1398	*1752	*1793	1377	
Flt Permitted			0.277		0.950			
Satd. Flow (perm)	*3372	0	440	1398	*1752	*1792	1377	
Right Turn on Red					No	No	Yes	
Satd. Flow (RTOR)					289			
Link Speed (mph)	25					25		
Link Distance (ft)	744					298		
Travel Time (s)	20.3					8.2		
Peak Hour Factor	0.92	0.91	0.91	0.96	0.81	0.95	0.91	
Heavy Vehicles (%)	0%	0%	1%	1%	3%	2%	1%	
Adj. Flow (vph)	435	35	242	583	107	461	289	
Shared Lane Traffic (%)								
Lane Group Flow (vph)	470	0	242	583	107	461	289	
Enter Blocked Intersection	No	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	Right	
Median Width(ft)	0					10		
Link Offset(ft)	0					0		
Crosswalk Width(ft)	8					8		
Two way Left Turn Lane								
Headway Factor	1.16	1.16	1.24	1.19	1.26	1.26	1.21	
Turning Speed (mph)	9		9	15	9		9	
Number of Detectors	1	1		1	1	1	1	
Detector Template	Left			Right				
Leading Detector (ft)	40	40		40	40	5	5	
Trailing Detector (ft)	0	0		0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	
Detector 1 Size(ft)	40	40		40	40	5	5	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel								
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	
Turn Type	NA	custom		custom	pm+pt	NA	custom	
Protected Phases	8	1		6	5	2	9	
Permitted Phases	6			2		2 8		
Detector Phase	8	1		6	5	2	2 8	
Switch Phase								
Minimum Initial (s)	7.0	5.0		10.0	5.0	10.0	1.0	

Lanes, Volumes, Timings
 14: Ann St & Broad St/5th St & Main Street

3/9/2015

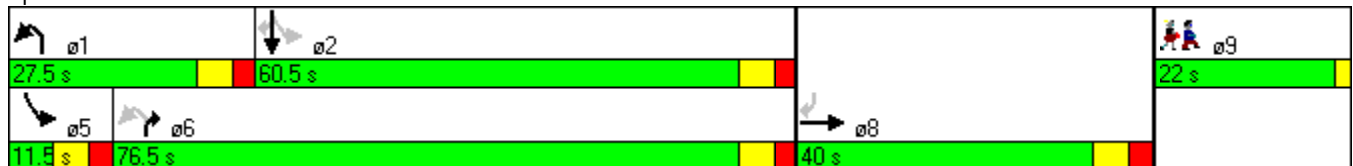


Lane Group	EBT	EBR	NBL2	NBR	SBL	SBT	SBR2	ø9
Minimum Split (s)	14.0		12.5	16.5	11.5	16.5		22.0
Total Split (s)	40.0		27.5	76.5	11.5	60.5		22.0
Total Split (%)	26.7%		18.3%	51.0%	7.7%	40.3%		15%
Maximum Green (s)	33.0		21.0	70.0	5.0	54.0		20.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0		2.0
All-Red Time (s)	3.0		2.5	2.5	2.5	2.5		0.0
Lost Time Adjust (s)	-2.5		0.0	-2.5	-2.5	-2.5		
Total Lost Time (s)	4.5		6.5	4.0	4.0	4.0		
Lead/Lag			Lead	Lag	Lead	Lag		
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		3.0
Recall Mode	None		None	None	None	C-Max		Ped
Walk Time (s)								7.0
Flash Dont Walk (s)								13.0
Pedestrian Calls (#/hr)								15
Act Effect Green (s)	29.5		87.1	76.1	76.5	66.5	98.0	
Actuated g/C Ratio	0.20		0.58	0.51	0.51	0.44	0.65	
v/c Ratio	0.71		0.64	0.82	0.12	0.58	0.29	
Control Delay	56.2		24.7	43.5	14.9	37.7	3.5	
Queue Delay	0.0		0.0	17.0	0.0	0.8	0.0	
Total Delay	56.2		24.7	60.5	14.9	38.4	3.5	
LOS	E		C	E	B	D	A	
Approach Delay	56.2					23.7		
Approach LOS	E					C		

Intersection Summary

Area Type: CBD
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 112 (75%), Referenced to phase 2:SBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 40.9
 Intersection LOS: D
 Intersection Capacity Utilization 67.7%
 ICU Level of Service C
 Analysis Period (min) 15
 * User Entered Value

Splits and Phases: 14: Ann St & Broad St/5th St & Main Street



HCM Signalized Intersection Capacity Analysis

14: Ann St & Broad St/5th St & Main Street

3/9/2015



Movement	EBT	EBR	NBL2	NBR	SBL	SBT	SBR2
Lane Configurations	↑↑		↖	↗	↖	↑	↗
Volume (vph)	400	32	220	560	87	438	263
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	10	11	10	10	11
Grade (%)	-5%			2%			
Total Lost time (s)	4.5		6.5	4.0	4.0	4.0	6.5
Lane Util. Factor	0.95		1.00	1.00	1.00	1.00	1.00
Frt	0.99		1.00	0.85	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3372		1509	1398	1752	1793	1377
Flt Permitted	1.00		0.28	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3372		440	1398	1752	1792	1377
Peak-hour factor, PHF	0.92	0.91	0.91	0.96	0.81	0.95	0.91
Adj. Flow (vph)	435	35	242	583	107	461	289
RTOR Reduction (vph)	0	0	0	0	0	0	101
Lane Group Flow (vph)	470	0	242	583	107	461	188
Heavy Vehicles (%)	0%	0%	1%	1%	3%	2%	1%
Turn Type	NA		custom	custom	pm+pt	NA	custom
Protected Phases	8		1	6	5	2	
Permitted Phases			6		2		2 8
Actuated Green, G (s)	27.0		87.5	73.6	71.4	64.0	97.5
Effective Green, g (s)	29.5		87.5	76.1	76.4	66.5	97.5
Actuated g/C Ratio	0.20		0.58	0.51	0.51	0.44	0.65
Clearance Time (s)	7.0		6.5	6.5	6.5	6.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	663		378	709	892	795	895
v/s Ratio Prot	c0.14		c0.07	c0.42	0.01	0.26	
v/s Ratio Perm			0.30		0.05		0.14
v/c Ratio	0.71		0.64	0.82	0.12	0.58	0.21
Uniform Delay, d1	56.2		20.2	31.2	19.2	31.3	10.6
Progression Factor	0.91		1.00	1.00	1.00	1.03	2.39
Incremental Delay, d2	3.1		3.7	7.6	0.1	3.0	0.1
Delay (s)	54.1		23.9	38.9	19.2	35.2	25.5
Level of Service	D		C	D	B	D	C
Approach Delay (s)	54.1					29.9	
Approach LOS	D					C	

Intersection Summary

HCM Average Control Delay	36.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	37.0
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
 26: Seventh St & 307 EB Exit Ramp/307 EB On Ramp

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	516	0	202	0	0	0	0	109	147	135	202	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			-5%			0%	
Storage Length (ft)	500		0	0		0	0		50	150		0
Storage Lanes	1		0	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850							0.850			
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1770	1583	0	0	0	0	0	1909	1623	1770	1863	0
Flt Permitted	0.950									0.559		
Satd. Flow (perm)	1770	1583	0	0	0	0	0	1909	1623	1041	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		572							160			
Link Speed (mph)		30			30			35			25	
Link Distance (ft)		976			583			171			344	
Travel Time (s)		22.2			13.3			3.3			9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	561	0	220	0	0	0	0	118	160	147	220	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	561	220	0	0	0	0	0	118	160	147	220	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.97	0.97	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2						2	1	1	2	
Detector Template	Left	Thru						Thru	Right	Left	Thru	
Leading Detector (ft)	20	100						100	20	20	100	
Trailing Detector (ft)	0	0						0	0	0	0	
Detector 1 Position(ft)	0	0						0	0	0	0	
Detector 1 Size(ft)	20	6						6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex						Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94						94			94	
Detector 2 Size(ft)		6						6			6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Prot	NA						NA	Perm	pm+pt	NA	
Protected Phases	7	4						2		1	6	
Permitted Phases									2	6		

Lanes, Volumes, Timings
 26: Seventh St & 307 EB Exit Ramp/307 EB On Ramp

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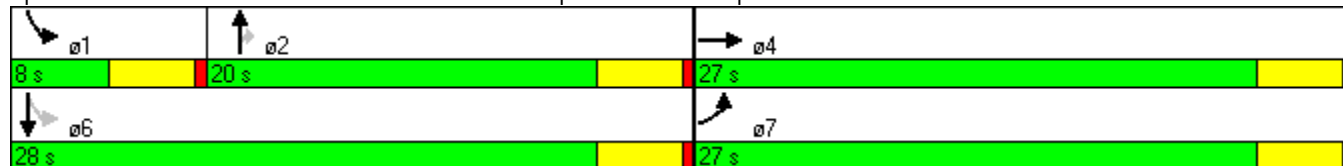


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4						2	2	1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Minimum Split (s)	8.0	20.0						20.0	20.0	8.0	20.0	
Total Split (s)	27.0	27.0						20.0	20.0	8.0	28.0	
Total Split (%)	49.1%	49.1%						36.4%	36.4%	14.5%	50.9%	
Maximum Green (s)	23.0	23.0						16.0	16.0	4.0	24.0	
Yellow Time (s)	3.5	3.5						3.5	3.5	3.5	3.5	
All-Red Time (s)	0.5	0.5						0.5	0.5	0.5	0.5	
Lost Time Adjust (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0						3.0	3.0	3.0	3.0	
Recall Mode	None	None						C-Max	C-Max	None	C-Max	
Act Effect Green (s)	20.8	20.8						19.1	19.1	26.2	26.2	
Actuated g/C Ratio	0.38	0.38						0.35	0.35	0.48	0.48	
v/c Ratio	0.84	0.23						0.18	0.24	0.26	0.25	
Control Delay	28.3	0.6						15.7	4.3	10.6	10.4	
Queue Delay	0.0	0.0						0.0	0.0	0.0	0.0	
Total Delay	28.3	0.6						15.7	4.3	10.6	10.4	
LOS	C	A						B	A	B	B	
Approach Delay		20.5						9.1			10.5	
Approach LOS		C						A			B	

Intersection Summary

Area Type:	Other
Cycle Length:	55
Actuated Cycle Length:	55
Offset:	0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Yellow
Natural Cycle:	55
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.84
Intersection Signal Delay:	15.7
Intersection LOS:	B
Intersection Capacity Utilization:	49.4%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 26: Seventh St & 307 EB Exit Ramp/307 EB On Ramp



HCM Signalized Intersection Capacity Analysis

26: Seventh St & 307 EB Exit Ramp/307 EB On Ramp

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗						↑	↖	↗	↑	
Volume (vph)	516	0	202	0	0	0	0	109	147	135	202	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			-5%			0%	
Total Lost time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00						1.00	1.00	1.00	1.00	
Frt	1.00	0.85						1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00						1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1583						1909	1623	1770	1863	
Flt Permitted	0.95	1.00						1.00	1.00	0.56	1.00	
Satd. Flow (perm)	1770	1583						1909	1623	1041	1863	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	561	0	220	0	0	0	0	118	160	147	220	0
RTOR Reduction (vph)	0	137	0	0	0	0	0	0	107	0	0	0
Lane Group Flow (vph)	561	83	0	0	0	0	0	118	53	147	220	0
Turn Type	Prot	NA						NA	Perm	pm+pt	NA	
Protected Phases	7	4						2		1	6	
Permitted Phases									2	6		
Actuated Green, G (s)	20.8	20.8						18.3	18.3	26.2	26.2	
Effective Green, g (s)	20.8	20.8						18.3	18.3	26.2	26.2	
Actuated g/C Ratio	0.38	0.38						0.33	0.33	0.48	0.48	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0						3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	669	599						635	540	548	887	
v/s Ratio Prot	c0.32	0.05						0.06		0.02	c0.12	
v/s Ratio Perm									0.03	c0.11		
v/c Ratio	0.84	0.14						0.19	0.10	0.27	0.25	
Uniform Delay, d1	15.6	11.2						13.1	12.7	8.4	8.6	
Progression Factor	1.00	1.00						1.00	1.00	1.00	1.00	
Incremental Delay, d2	9.0	0.1						0.6	0.4	0.3	0.7	
Delay (s)	24.6	11.3						13.7	13.0	8.7	9.2	
Level of Service	C	B						B	B	A	A	
Approach Delay (s)		20.9			0.0			13.3			9.0	
Approach LOS		C			A			B			A	



















Intersection Summary

HCM Average Control Delay	16.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Capacity Analysis
 26: Seventh St & 307 EB Exit Ramp/307 EB On Ramp

3/9/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	516	0	202	0	0	0	0	109	147	135	202	0
Movement Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Queue, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj. Factor (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking, Bus Adj. Factors	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Sat. Flow Rate, veh/h/ln	1863	1900	1863	1900	1900	1900	1900	1909	1909	1863	1863	1900
Lanes	1	1	0	0	0	0	0	1	1	1	1	0
Lane Assignment												
Capacity, veh/h	671	0	611	0	0	0	0	910	773	0	887	0
Proportion Arriving On Green	0.38	0.00	0.38	0.00	0.00	0.00	0.00	0.48	0.48	0.00	0.42	0.00
Movement Delay, s/veh	24.6	0.0	12.7	0.0	0.0	0.0	0.0	8.3	9.0	0.0	10.2	0.0
Movement LOS	C		B					A	A		B	
Approach Volume, veh/h		780			0			278			220	
Approach Delay, s/veh		21.2			0.0			8.7			10.2	
Approach LOS		C						A			B	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phase			2		4		6	7				
Case No			7.0		4.0		4.0	2.0				
Phase Duration (G+Y+Rc), s			30.20		24.80		30.20	24.80				
Change Period (Y+Rc), s			4.00		4.00		4.00	4.00				
Max. Allowable Headway (MAH), s			4.88		0.33		4.88	3.81				
Maximum Green Setting (Gmax), s			19.10		20.80		26.20	20.80				
Max. Queue Clearance Time (g_c+I1), s			5.15		7.38		6.22	17.81				
Green Extension Time (g_e), s			2.15		0.00		2.44	0.65				
Probability of Phase Call (p_c)			1.000		1.000		1.000	1.000				
Probability of Max Out (p_x)			0.068		0.000		0.011	1.000				
Left-Turn Movement Data												
Assigned Movement								7				
Mvmt. Sat Flow, veh/h								1774.04				
Through Movement Data												
Assigned Movement			2		4		6					
Mvmt. Sat Flow, veh/h			1909.31		0.00		1862.75					
Right-Turn Movement Data												
Assigned Movement			12		14		16					
Mvmt. Sat Flow, veh/h			1622.92		1615.00		0.00					
Left Lane Group Data												
Assigned Movement		0	0	0	0	0	0	7	0			
Lane Assignment								L (Prot)				
Lanes in Group		0	0	0	0	0	0	1	0			
Group Volume (v), veh/h		0.0	0.0	0.0	0.0	0.0	0.0	560.9	0.0			
Group Sat. Flow (s), veh/h/ln		0.0	0.0	0.0	0.0	0.0	0.0	1774.0	0.0			
Queue Serve Time (g_s), s		0.0	0.0	0.0	0.0	0.0	0.0	15.8	0.0			
Cycle Queue Clear Time (g_c), s		0.0	0.0	0.0	0.0	0.0	0.0	15.8	0.0			

HCM 2010 Signalized Intersection Capacity Analysis
 26: Seventh St & 307 EB Exit Ramp/307 EB On Ramp

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Perm LT Sat Flow Rate (s_l), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shared LT Sat Flow (s_sh), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Eff. Green (g_p), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Que Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	26.2	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Proportion LT Inside Lane (P_L)	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000
Lane Group Capacity (c), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	670.8	0.0
Volume-to-Capacity Ratio (X)	0.000	0.000	0.000	0.000	0.000	0.000	0.836	0.000
Available Capacity (c_a), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	670.9	0.0
Upstream Filter Factor (I)	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	15.6	0.0
Incremental Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	9.1	0.0
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	24.6	0.0
First-Term Queue (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	5.4	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile bk-of-que factor (f_B%)	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	7.1	0.0
Percentile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.00
Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Queue (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Movement	0	2	0	4	0	6	0	0
Lane Assignment		T				T		
Lanes in Group	0	1	0	0	0	1	0	0
Group Volume (v), veh/h	0.0	118.5	0.0	0.0	0.0	219.6	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	1909.3	0.0	0.0	0.0	1862.7	0.0	0.0
Queue Serve Time (g_s), s	0.0	1.9	0.0	0.0	0.0	4.2	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	1.9	0.0	0.0	0.0	4.2	0.0	0.0
Lane Group Capacity (c), veh/h	0.0	909.5	0.0	0.0	0.0	887.3	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.130	0.000	0.000	0.000	0.247	0.000	0.000
Available Capacity (c_a), veh/h	0.0	909.5	0.0	0.0	0.0	887.3	0.0	0.0
Upstream Filter Factor (I)	0.000	1.000	0.000	0.000	0.000	0.880	0.000	0.000
Uniform Delay (d1), s/veh	0.0	8.0	0.0	0.0	0.0	9.7	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.3	0.0	0.0	0.0	0.6	0.0	0.0
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	8.3	0.0	0.0	0.0	10.2	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.6	0.0	0.0	0.0	1.5	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile bk-of-que factor (f_B%)	0.000	1.000	0.000	1.000	0.000	1.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.7	0.0	0.0	0.0	1.7	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.15	0.00	0.00	0.00	0.14	0.00	0.00

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Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Queue (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Movement	0	12	0	14	0	16	0	0
Lane Assignment		R		T+R				
Lanes in Group	0	1	0	1	0	0	0	0
Group Volume (v), veh/h	0.0	159.8	0.0	219.6	0.0	0.0	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	1622.9	0.0	1615.0	0.0	0.0	0.0	0.0
Queue Serve Time (g_s), s	0.0	3.1	0.0	5.4	0.0	0.0	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	3.1	0.0	5.4	0.0	0.0	0.0	0.0
Prot RT Sat Flow Rate (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff. Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Proportion RT Outside Lane (P_R)	0.000	1.000	0.000	1.000	0.000	0.000	0.000	0.000
Lane Group Capacity (c), veh/h	0.0	773.1	0.0	610.8	0.0	0.0	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.207	0.000	0.359	0.000	0.000	0.000	0.000
Available Capacity (c_a), veh/h	0.0	773.1	0.0	610.8	0.0	0.0	0.0	0.0
Upstream Filter Factor (I)	0.000	1.000	0.000	1.000	0.000	0.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	8.4	0.0	12.3	0.0	0.0	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.6	0.0	0.4	0.0	0.0	0.0	0.0
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	9.0	0.0	12.7	0.0	0.0	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.9	0.0	2.4	0.0	0.0	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile bk-of-que factor (f_B%)	0.000	1.000	0.000	1.000	0.000	1.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	1.0	0.0	2.5	0.0	0.0	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.51	0.00	0.07	0.00	0.00	0.00	0.00
Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Queue (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM Average Control Delay	16.6
HCM Level of Service	B

Lanes, Volumes, Timings
 3: Broad St & 307 WB On Ramp/307 WB Exit Ramp

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↗	↕			↕	↗
Volume (vph)	0	0	0	120	1	518	320	327	0	0	217	470
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			-1%			0%	
Storage Length (ft)	0		0	0		50	75		0	0		50
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected					0.953		0.950					
Satd. Flow (prot)	0	0	0	0	1775	1583	1778	1872	0	0	1863	1583
Flt Permitted					0.953		0.497					
Satd. Flow (perm)	0	0	0	0	1775	1583	930	1872	0	0	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						472						425
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		283			303			238			203	
Travel Time (s)		6.4			6.9			4.6			4.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	130	1	563	348	355	0	0	236	511
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	131	563	348	355	0	0	236	511
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	0.99	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2	1	1	2			2	1
Detector Template				Left	Thru	Right	Left	Thru			Thru	Right
Leading Detector (ft)				20	100	20	20	100			100	20
Trailing Detector (ft)				0	0	0	0	0			0	0
Detector 1 Position(ft)				0	0	0	0	0			0	0
Detector 1 Size(ft)				20	6	20	20	6			6	20
Detector 1 Type				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Split	NA	Perm	pm+pt	NA			NA	Free
Protected Phases				8	8			5	2		6	
Permitted Phases						8	2					Free

Lanes, Volumes, Timings

3: Broad St & 307 WB On Ramp/307 WB Exit Ramp

3/9/2015

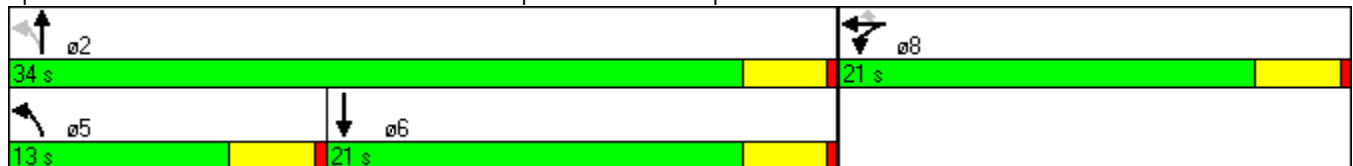


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8	8	8	5	2			6	
Switch Phase												
Minimum Initial (s)				4.0	4.0	4.0	4.0	4.0			4.0	
Minimum Split (s)				20.0	20.0	20.0	8.0	20.0			20.0	
Total Split (s)				21.0	21.0	21.0	13.0	34.0			21.0	
Total Split (%)				38.2%	38.2%	38.2%	23.6%	61.8%			38.2%	
Maximum Green (s)				17.0	17.0	17.0	9.0	30.0			17.0	
Yellow Time (s)				3.5	3.5	3.5	3.5	3.5			3.5	
All-Red Time (s)				0.5	0.5	0.5	0.5	0.5			0.5	
Lost Time Adjust (s)					0.0	0.0	0.0	0.0			0.0	
Total Lost Time (s)					4.0	4.0	4.0	4.0			4.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	
Recall Mode				None	None	None	None	C-Max			C-Max	
Act Effect Green (s)					12.0	12.0	35.0	35.0			22.3	55.0
Actuated g/C Ratio					0.22	0.22	0.64	0.64			0.41	1.00
v/c Ratio					0.34	0.79	0.48	0.30			0.31	0.32
Control Delay					18.8	12.5	8.2	6.4			14.6	0.5
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					18.8	12.5	8.2	6.4			14.6	0.5
LOS					B	B	A	A			B	A
Approach Delay					13.7			7.3			5.0	
Approach LOS					B			A			A	

Intersection Summary

Area Type:	Other
Cycle Length:	55
Actuated Cycle Length:	55
Offset:	0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle:	55
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.79
Intersection Signal Delay:	8.6
Intersection LOS:	A
Intersection Capacity Utilization:	56.8%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 3: Broad St & 307 WB On Ramp/307 WB Exit Ramp



HCM Signalized Intersection Capacity Analysis

3: Broad St & 307 WB On Ramp/307 WB Exit Ramp

3/9/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↖	↑			↕	↗
Volume (vph)	0	0	0	120	1	518	320	327	0	0	217	470
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			-1%			0%	
Total Lost time (s)					4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor					1.00	1.00	1.00	1.00			1.00	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					1775	1583	1778	1872			1863	1583
Flt Permitted					0.95	1.00	0.50	1.00			1.00	1.00
Satd. Flow (perm)					1775	1583	930	1872			1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	130	1	563	348	355	0	0	236	511
RTOR Reduction (vph)	0	0	0	0	0	369	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	131	194	348	355	0	0	236	511
Turn Type				Split	NA	Perm	pm+pt	NA			NA	Free
Protected Phases				8	8		5	2			6	
Permitted Phases						8	2					Free
Actuated Green, G (s)					12.0	12.0	35.0	35.0			22.3	55.0
Effective Green, g (s)					12.0	12.0	35.0	35.0			22.3	55.0
Actuated g/C Ratio					0.22	0.22	0.64	0.64			0.41	1.00
Clearance Time (s)					4.0	4.0	4.0	4.0			4.0	
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)					387	345	726	1191			755	1583
v/s Ratio Prot					0.07		c0.08	0.19			0.13	
v/s Ratio Perm						c0.12	c0.23					0.32
v/c Ratio					0.34	0.56	0.48	0.30			0.31	0.32
Uniform Delay, d1					18.1	19.2	4.8	4.5			11.1	0.0
Progression Factor					1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2					0.5	2.1	0.5	0.6			1.1	0.5
Delay (s)					18.7	21.3	5.3	5.1			12.2	0.5
Level of Service					B	C	A	A			B	A
Approach Delay (s)		0.0			20.8			5.2			4.2	
Approach LOS		A			C			A			A	



















Intersection Summary

HCM Average Control Delay	9.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Capacity Analysis
 3: Broad St & 307 WB On Ramp/307 WB Exit Ramp

3/9/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	120	1	518	320	327	0	0	217	470
Movement Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Queue, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj. Factor (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking, Bus Adj. Factors	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Sat. Flow Rate, veh/h/ln	1900	1900	1900	1863	1863	1863	1872	1872	1900	1900	1863	1863
Lanes	0	0	0	0	1	1	1	1	0	0	1	1
Lane Assignment												
Capacity, veh/h	0	0	0	384	3	345	0	1191	0	0	1185	1008
Proportion Arriving On Green	0.00	0.00	0.00	0.22	0.22	0.22	0.00	0.64	0.00	0.00	0.64	0.64
Movement Delay, s/veh	0.0	0.0	0.0	18.7	0.0	178.6	0.0	5.1	0.0	0.0	4.5	7.2
Movement LOS				B		F		A			A	A
Approach Volume, veh/h		0			583			355			747	
Approach Delay, s/veh		0.0			142.5			5.1			6.4	
Approach LOS					F			A			A	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phase			2	8			6					
Case No			4.0	11.0			7.0					
Phase Duration (G+Y+Rc), s			39.00	16.00			39.00					
Change Period (Y+Rc), s			4.00	4.00			4.00					
Max. Allowable Headway (MAH), s			4.59	4.32			4.59					
Maximum Green Setting (Gmax), s			35.00	12.00			22.30					
Max. Queue Clearance Time (g_c+I1), s			6.69	14.00			11.53					
Green Extension Time (g_e), s			5.98	0.00			4.14					
Probability of Phase Call (p_c)			1.000	1.000			1.000					
Probability of Max Out (p_x)			0.041	1.000			0.436					
Left-Turn Movement Data												
Assigned Movement				3								
Mvmt. Sat Flow, veh/h				1760.07								
Through Movement Data												
Assigned Movement			2	8			6					
Mvmt. Sat Flow, veh/h			1872.06	14.67			1862.75					
Right-Turn Movement Data												
Assigned Movement			12	18			16					
Mvmt. Sat Flow, veh/h			0.00	1583.33			1583.33					
Left Lane Group Data												
Assigned Movement		0	0	3	0	0	0	0	0			
Lane Assignment				L+T								
Lanes in Group		0	0	1	0	0	0	0	0			
Group Volume (v), veh/h		0.0	0.0	131.5	0.0	0.0	0.0	0.0	0.0			
Group Sat. Flow (s), veh/h/ln		0.0	0.0	1774.7	0.0	0.0	0.0	0.0	0.0			
Queue Serve Time (g_s), s		0.0	0.0	3.4	0.0	0.0	0.0	0.0	0.0			
Cycle Queue Clear Time (g_c), s		0.0	0.0	3.4	0.0	0.0	0.0	0.0	0.0			

HCM 2010 Signalized Intersection Capacity Analysis

3: Broad St & 307 WB On Ramp/307 WB Exit Ramp

3/9/2015

Perm LT Sat Flow Rate (s_l), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Shared LT Sat Flow (s_sh), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Perm LT Eff. Green (g_p), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Perm LT Que Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	35.0	0.0	0.0	
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Proportion LT Inside Lane (P_L)	0.000	0.000	0.992	0.000	0.000	0.000	0.000	0.000	
Lane Group Capacity (c), veh/h	0.0	0.0	387.2	0.0	0.0	0.0	0.0	0.0	
Volume-to-Capacity Ratio (X)	0.000	0.000	0.340	0.000	0.000	0.000	0.000	0.000	
Available Capacity (c_a), veh/h	0.0	0.0	387.2	0.0	0.0	0.0	0.0	0.0	
Upstream Filter Factor (I)	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000	
Uniform Delay (d1), s/veh	0.0	0.0	18.2	0.0	0.0	0.0	0.0	0.0	
Incremental Delay (d2), s/veh	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	0.0	0.0	18.7	0.0	0.0	0.0	0.0	0.0	
First-Term Queue (Q1), veh/ln	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	
Second-Term Queue (Q2), veh/ln	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Percentile bk-of-que factor (f_B%)	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000	
Percentile Back of Queue (Q%), veh/ln	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	
Percentile Storage Ratio (RQ%)	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	
Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Final (Residual) Queue (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Initial Queue Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Middle Lane Group Data									
Assigned Movement	0	2	8	0	0	6	0	0	
Lane Assignment	T							T	
Lanes in Group	0	1	0	0	0	1	0	0	
Group Volume (v), veh/h	0.0	355.4	0.0	0.0	0.0	235.9	0.0	0.0	
Group Sat. Flow (s), veh/h/ln	0.0	1872.1	0.0	0.0	0.0	1862.7	0.0	0.0	
Queue Serve Time (g_s), s	0.0	4.7	0.0	0.0	0.0	2.9	0.0	0.0	
Cycle Queue Clear Time (g_c), s	0.0	4.7	0.0	0.0	0.0	2.9	0.0	0.0	
Lane Group Capacity (c), veh/h	0.0	1191.3	0.0	0.0	0.0	1185.4	0.0	0.0	
Volume-to-Capacity Ratio (X)	0.000	0.298	0.000	0.000	0.000	0.199	0.000	0.000	
Available Capacity (c_a), veh/h	0.0	1191.3	0.0	0.0	0.0	1185.4	0.0	0.0	
Upstream Filter Factor (I)	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.000	
Uniform Delay (d1), s/veh	0.0	4.5	0.0	0.0	0.0	4.2	0.0	0.0	
Incremental Delay (d2), s/veh	0.0	0.6	0.0	0.0	0.0	0.4	0.0	0.0	
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	0.0	5.1	0.0	0.0	0.0	4.5	0.0	0.0	
First-Term Queue (Q1), veh/ln	0.0	1.1	0.0	0.0	0.0	0.7	0.0	0.0	
Second-Term Queue (Q2), veh/ln	0.0	0.2	0.0	0.0	0.0	0.1	0.0	0.0	
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Percentile bk-of-que factor (f_B%)	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000	
Percentile Back of Queue (Q%), veh/ln	0.0	1.3	0.0	0.0	0.0	0.8	0.0	0.0	
Percentile Storage Ratio (RQ%)	0.00	0.18	0.00	0.00	0.00	0.15	0.00	0.00	






















HCM 2010 Signalized Intersection Capacity Analysis
 3: Broad St & 307 WB On Ramp/307 WB Exit Ramp

3/9/2015

Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Queue (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Movement	0	12	18	0	0	16	0	0
Lane Assignment			R			R		
Lanes in Group	0	0	1	0	0	1	0	0
Group Volume (v), veh/h	0.0	0.0	451.1	0.0	0.0	510.9	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	0.0	1583.3	0.0	0.0	1583.3	0.0	0.0
Queue Serve Time (g_s), s	0.0	0.0	12.0	0.0	0.0	9.5	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	0.0	12.0	0.0	0.0	9.5	0.0	0.0
Prot RT Sat Flow Rate (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff. Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Proportion RT Outside Lane (P_R)	0.000	0.000	1.000	0.000	0.000	1.000	0.000	0.000
Lane Group Capacity (c), veh/h	0.0	0.0	345.5	0.0	0.0	1007.6	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.000	1.306	0.000	0.000	0.507	0.000	0.000
Available Capacity (c_a), veh/h	0.0	0.0	345.5	0.0	0.0	1007.6	0.0	0.0
Upstream Filter Factor (I)	0.000	0.000	1.000	0.000	0.000	1.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	0.0	21.5	0.0	0.0	5.4	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.0	157.1	0.0	0.0	1.8	0.0	0.0
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	178.6	0.0	0.0	7.2	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.0	4.0	0.0	0.0	1.8	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.0	15.1	0.0	0.0	0.5	0.0	0.0
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile bk-of-que factor (f_B%)	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.0	19.1	0.0	0.0	2.4	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.00	9.69	0.00	0.00	1.20	0.00	0.00
Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Queue (Qe), veh	0.0	0.0	26.4	0.0	0.0	0.0	0.0	0.0
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Clear Time (tc), h	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Intersection Summary								
HCM Average Control Delay	53.2							
HCM Level of Service	D							

Lanes, Volumes, Timings
8: Dreher Ave/School Drive & Main Street

3/9/2015

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	399	177	290	559	107	74	116	408	116	43	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	14	12	11	12	14	12	14	16	14	14	12
Grade (%)		-1%			0%			1%			1%	
Storage Length (ft)	145		0	125		210	85		0	105		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.956				0.850		0.879			0.913	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1337	1639	0	1525	1613	1397	1483	1529	0	1567	1506	0
Flt Permitted	0.181			0.129			0.685			0.167		
Satd. Flow (perm)	255	1639	0	207	1613	1397	1069	1529	0	276	1506	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18				91		180			58	
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		538			949			624			208	
Travel Time (s)		10.5			18.5			12.2			5.7	
Peak Hour Factor	0.92	0.86	0.92	0.91	0.92	0.92	0.81	0.92	0.77	0.92	0.92	0.92
Heavy Vehicles (%)	18%	4%	14%	3%	6%	11%	9%	10%	3%	10%	10%	10%
Adj. Flow (vph)	62	464	192	319	608	116	91	126	530	126	47	65
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	656	0	319	608	116	91	656	0	126	112	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.19	1.05	1.14	1.19	1.14	1.05	1.15	1.06	0.98	1.06	1.06	1.15
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	5	5		40	5	5	40	40		40	40	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	5	5		40	5	5	40	40		40	40	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	2	2		1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0	10.0	7.0	7.0		7.0	7.0	

Lanes, Volumes, Timings
 8: Dreher Ave/School Drive & Main Street

3/9/2015

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0

Lanes, Volumes, Timings
 8: Dreher Ave/School Drive & Main Street

3/9/2015

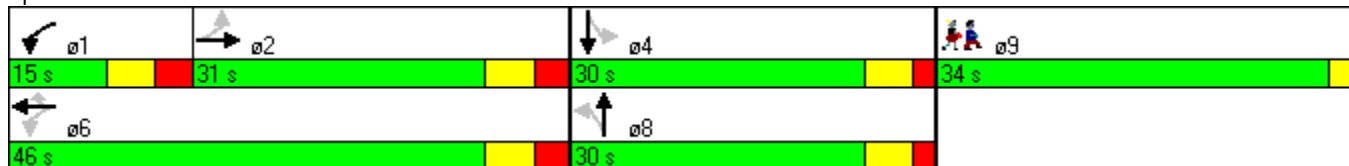


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	17.0	17.0		12.0	17.0	17.0	13.0	13.0		13.0	13.0	
Total Split (s)	31.0	31.0		15.0	46.0	46.0	30.0	30.0		30.0	30.0	
Total Split (%)	28.2%	28.2%		13.6%	41.8%	41.8%	27.3%	27.3%		27.3%	27.3%	
Maximum Green (s)	24.0	24.0		8.0	39.0	39.0	24.0	24.0		24.0	24.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	0.0	-2.0	-2.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	7.0	4.0	4.0		6.0	6.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	C-Max	C-Max	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effect Green (s)	26.0	26.0		41.0	41.0	39.0	26.0	26.0		24.0	24.0	
Actuated g/C Ratio	0.24	0.24		0.37	0.37	0.35	0.24	0.24		0.22	0.22	
v/c Ratio	1.03	1.64		1.62	1.01	0.21	0.36	1.31		2.10	0.30	
Control Delay	170.8	326.5		324.6	74.9	8.7	40.0	181.8		571.6	21.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	170.8	326.5		324.6	74.9	8.7	40.0	181.8		571.6	21.0	
LOS	F	F		F	E	A	D	F		F	C	
Approach Delay		313.1			143.9			164.5			312.5	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type: CBD
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 2.10
 Intersection Signal Delay: 208.4 Intersection LOS: F
 Intersection Capacity Utilization 111.7% ICU Level of Service H
 Analysis Period (min) 15

Splits and Phases: 8: Dreher Ave/School Drive & Main Street



Lane Group	ø9
Minimum Split (s)	34.0
Total Split (s)	34.0
Total Split (%)	31%
Maximum Green (s)	32.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	25.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

8: Dreher Ave/School Drive & Main Street

3/9/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	399	177	290	559	107	74	116	408	116	43	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	14	12	11	12	14	12	14	16	14	14	12
Grade (%)		-1%			0%			1%				1%
Total Lost time (s)	5.0	5.0		5.0	5.0	7.0	4.0	4.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.88		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1337	1639		1525	1613	1397	1483	1529		1567	1506	
Flt Permitted	0.18	1.00		0.13	1.00	1.00	0.68	1.00		0.17	1.00	
Satd. Flow (perm)	254	1639		207	1613	1397	1069	1529		275	1506	
Peak-hour factor, PHF	0.92	0.86	0.92	0.91	0.92	0.92	0.81	0.92	0.77	0.92	0.92	0.92
Adj. Flow (vph)	62	464	192	319	608	116	91	126	530	126	47	65
RTOR Reduction (vph)	0	14	0	0	0	59	0	137	0	0	45	0
Lane Group Flow (vph)	62	642	0	319	608	57	91	519	0	126	67	0
Heavy Vehicles (%)	18%	4%	14%	3%	6%	11%	9%	10%	3%	10%	10%	10%
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	24.0	24.0		39.0	39.0	39.0	24.0	24.0		24.0	24.0	
Effective Green, g (s)	26.0	26.0		41.0	41.0	39.0	26.0	26.0		24.0	24.0	
Actuated g/C Ratio	0.24	0.24		0.37	0.37	0.35	0.24	0.24		0.22	0.22	
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	60	387		197	601	495	253	361		60	329	
v/s Ratio Prot		0.39		c0.15	0.38			0.34			0.04	
v/s Ratio Perm	0.24			c0.46		0.04	0.09			c0.46		
v/c Ratio	1.03	1.66		1.62	1.01	0.12	0.36	1.44		2.10	0.20	
Uniform Delay, d1	42.0	42.0		29.1	34.5	23.9	35.1	42.0		43.0	35.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	125.8	308.1		300.8	39.6	0.5	0.9	211.6		546.8	0.3	
Delay (s)	167.8	350.1		329.9	74.1	24.4	35.9	253.6		589.8	35.5	
Level of Service	F	F		F	E	C	D	F		F	D	
Approach Delay (s)		334.3			146.8			227.1			329.0	
Approach LOS		F			F			F			F	

Intersection Summary

HCM Average Control Delay	233.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.74		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	45.0
Intersection Capacity Utilization	111.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
9: 9th St & Main Street

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕	↗		↕↕		↗	↗	
Volume (vph)	177	419	7	2	384	161	43	74	63	301	8	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	11	11	12	11	11	11	10	10	10
Grade (%)		4%			1%			5%			-2%	
Storage Length (ft)	0		0	0		0	0		0	135		0
Storage Lanes	0		0	0		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996				0.850		0.954			0.867	
Flt Protected		0.981						0.989		0.950		
Satd. Flow (prot)	0	2716	0	0	1597	1252	0	1494	0	1516	1378	0
Flt Permitted		0.553			0.994			0.919		0.504		
Satd. Flow (perm)	0	1531	0	0	1588	1252	0	1388	0	804	1378	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25				35
Link Distance (ft)		352			552			437				1438
Travel Time (s)		7.9			5.2			11.9				4.1
Peak Hour Factor	0.57	0.85	0.35	0.50	0.81	0.77	0.77	0.64	0.72	0.91	1.00	0.55
Heavy Vehicles (%)	9%	3%	0%	0%	3%	4%	2%	3%	0%	1%	13%	0%
Parking (#/hr)		0	0			0						
Adj. Flow (vph)	311	493	20	4	474	209	56	116	88	331	8	64
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	824	0	0	478	209	0	260	0	331	72	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			10			10	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.22	1.30	1.17	1.20	1.20	1.31	1.23	1.23	1.23	1.23	1.23	1.23
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	50	40		50	5	5	50	40		40	40	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	50	40		50	5	5	50	40		40	40	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8				4
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	

Lanes, Volumes, Timings
9: 9th St & Main Street

3/9/2015

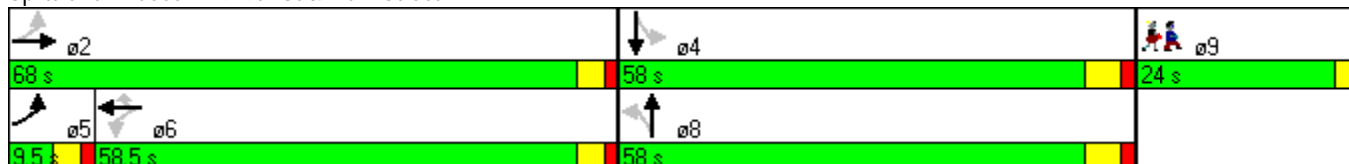


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	9.5	14.5		14.5	14.5	14.5	13.0	13.0		13.0	13.0	
Total Split (s)	9.5	68.0		58.5	58.5	58.5	58.0	58.0		58.0	58.0	
Total Split (%)	6.3%	45.3%		39.0%	39.0%	39.0%	38.7%	38.7%		38.7%	38.7%	
Maximum Green (s)	5.0	63.5		54.0	54.0	54.0	52.0	52.0		52.0	52.0	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-0.5			-0.5	-0.5		-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0			4.0	4.0		4.0		4.0	4.0	
Lead/Lag	Lead			Lag			Lag					
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		64.0			64.0	64.0		54.0		54.0	54.0	
Actuated g/C Ratio		0.43			0.43	0.43		0.36		0.36	0.36	
v/c Ratio		1.92dl			0.71	0.39		0.52		1.15	0.15	
Control Delay		166.7			30.7	24.1		42.4		141.1	33.5	
Queue Delay		0.0			2.1	0.0		0.0		0.0	0.0	
Total Delay		166.7			32.9	24.1		42.4		141.1	33.5	
LOS		F			C	C		D		F	C	
Approach Delay		166.7			30.2			42.4			121.8	
Approach LOS		F			C			D			F	

Intersection Summary

Area Type: CBD
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 62 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.26
 Intersection Signal Delay: 100.4
 Intersection LOS: F
 Intersection Capacity Utilization 84.5%
 ICU Level of Service E
 Analysis Period (min) 15
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 9: 9th St & Main Street



Lane Group	ø9
Minimum Initial (s)	1.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	16%
Maximum Green (s)	22.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	8.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

9: 9th St & Main Street

3/9/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕	↕		↕		↕	↕	
Volume (vph)	177	419	7	2	384	161	43	74	63	301	8	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	12	11	11	11	10	10	10
Grade (%)		4%			1%			5%			-2%	
Total Lost time (s)		4.0			4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor		0.95			1.00	1.00		1.00		1.00	1.00	
Frt		1.00			1.00	0.85		0.95		1.00	0.87	
Flt Protected		0.98			1.00	1.00		0.99		0.95	1.00	
Satd. Flow (prot)		2718			1597	1252		1495		1516	1377	
Flt Permitted		0.55			0.99	1.00		0.92		0.50	1.00	
Satd. Flow (perm)		1532			1588	1252		1390		805	1377	
Peak-hour factor, PHF	0.57	0.85	0.35	0.50	0.81	0.77	0.77	0.64	0.72	0.91	1.00	0.55
Adj. Flow (vph)	311	493	20	4	474	209	56	116	88	331	8	64
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	824	0	0	478	209	0	260	0	331	72	0
Heavy Vehicles (%)	9%	3%	0%	0%	3%	4%	2%	3%	0%	1%	13%	0%
Parking (#/hr)		0	0			0						
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8				4
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)		63.5			63.5	63.5		52.0		52.0	52.0	
Effective Green, g (s)		64.0			64.0	64.0		54.0		54.0	54.0	
Actuated g/C Ratio		0.43			0.43	0.43		0.36		0.36	0.36	
Clearance Time (s)		4.5			4.5	4.5		6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		654			678	534		500		290	496	
v/s Ratio Prot												0.05
v/s Ratio Perm		c0.54			0.30	0.17		0.19		c0.41		
v/c Ratio		1.92dl			0.71	0.39		0.52		1.14	0.15	
Uniform Delay, d1		43.0			35.3	29.6		37.8		48.0	32.4	
Progression Factor		1.00			0.70	0.73		1.00		1.00	1.00	
Incremental Delay, d2		129.1			5.6	2.0		1.0		96.6	0.1	
Delay (s)		172.1			30.2	23.7		38.8		144.6	32.5	
Level of Service		F			C	C		D		F	C	
Approach Delay (s)		172.1			28.2			38.8			124.6	
Approach LOS		F			C			D			F	

Intersection Summary

HCM Average Control Delay	101.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	32.0
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

Lanes, Volumes, Timings
10: 8th St & Main Street/Main Street

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕			↕↕	
Volume (vph)	44	575	22	6	330	8	65	76	35	43	19	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	13	13	13	10	10	10	10	10	10
Grade (%)		0%			0%			1%			-1%	
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993			0.996			0.968			0.931	
Flt Protected		0.996			0.999			0.984			0.984	
Satd. Flow (prot)	0	*3502	0	0	*1772	0	0	*1760	0	0	*1624	0
Flt Permitted		0.886			0.977			0.835			0.818	
Satd. Flow (perm)	0	*3021	0	0	*1733	0	0	*1405	0	0	*1397	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		552			555			340			310	
Travel Time (s)		8.5			8.2			9.3			8.5	
Peak Hour Factor	0.73	0.93	0.69	0.50	0.86	0.67	0.90	0.79	0.67	0.77	0.68	0.77
Heavy Vehicles (%)	7%	2%	5%	0%	1%	0%	3%	0%	3%	2%	0%	2%
Parking (#/hr)		0	0	0	0	0	0	0	0	0	0	0
Adj. Flow (vph)	60	618	32	12	384	12	72	96	52	56	28	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	710	0	0	408	0	0	220	0	0	172	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.19	1.27	1.19	1.10	1.25	1.10	1.26	1.43	1.26	1.24	1.24	1.24
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	5		50	5		50	40		50	40	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	50	5		50	5		50	40		50	40	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.5	14.5		14.5	14.5		12.5	12.5		12.5	12.5	
Total Split (s)	27.5	27.5		27.5	27.5		25.5	25.5		25.5	25.5	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	22.0
Total Split (s)	22.0

Lanes, Volumes, Timings
 10: 8th St & Main Street/Main Street

3/9/2015

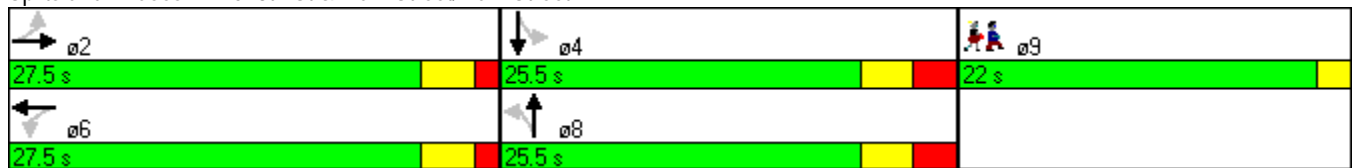


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	36.7%	36.7%		36.7%	36.7%		34.0%	34.0%		34.0%	34.0%	
Maximum Green (s)	23.0	23.0		23.0	23.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)		-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)		2.5			2.5			3.5			3.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		30.9			30.9			18.1			18.1	
Actuated g/C Ratio		0.41			0.41			0.24			0.24	
v/c Ratio		0.57			0.57			0.65			0.51	
Control Delay		15.1			19.8			34.4			29.4	
Queue Delay		0.1			0.1			0.1			0.0	
Total Delay		15.2			19.9			34.5			29.4	
LOS		B			B			C			C	
Approach Delay		15.2			19.9			34.5			29.4	
Approach LOS		B			B			C			C	

Intersection Summary

Area Type: CBD
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 44 (59%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.65
 Intersection Signal Delay: 20.9
 Intersection LOS: C
 Intersection Capacity Utilization 63.8%
 ICU Level of Service B
 Analysis Period (min) 15
 * User Entered Value

Splits and Phases: 10: 8th St & Main Street/Main Street



Lane Group	ø9
Total Split (%)	29%
Maximum Green (s)	20.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

10: 8th St & Main Street/Main Street

3/9/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕			↕↕	
Volume (vph)	44	575	22	6	330	8	65	76	35	43	19	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	13	13	13	10	10	10	10	10	10
Grade (%)		0%			0%			1%			-1%	
Total Lost time (s)		2.5			2.5			3.5			3.5	
Lane Util. Factor		0.95			1.00			1.00			1.00	
Frt		0.99			1.00			0.97			0.93	
Flt Protected		1.00			1.00			0.98			0.98	
Satd. Flow (prot)		3502			1772			1760			1624	
Flt Permitted		0.89			0.98			0.83			0.82	
Satd. Flow (perm)		3021			1733			1405			1397	
Peak-hour factor, PHF	0.73	0.93	0.69	0.50	0.86	0.67	0.90	0.79	0.67	0.77	0.68	0.77
Adj. Flow (vph)	60	618	32	12	384	12	72	96	52	56	28	88
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	710	0	0	408	0	0	220	0	0	172	0
Heavy Vehicles (%)	7%	2%	5%	0%	1%	0%	3%	0%	3%	2%	0%	2%
Parking (#/hr)		0	0	0	0	0	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		28.9			28.9			16.1			16.1	
Effective Green, g (s)		30.9			30.9			18.1			18.1	
Actuated g/C Ratio		0.41			0.41			0.24			0.24	
Clearance Time (s)		4.5			4.5			5.5			5.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1245			714			339			337	
v/s Ratio Prot												
v/s Ratio Perm		0.24			0.24			0.16			0.12	
v/c Ratio		0.57			0.57			0.65			0.51	
Uniform Delay, d1		16.9			17.0			25.6			24.6	
Progression Factor		0.84			1.08			1.00			1.00	
Incremental Delay, d2		0.2			0.3			4.2			1.3	
Delay (s)		14.4			18.6			29.8			25.9	
Level of Service		B			B			C			C	
Approach Delay (s)		14.4			18.6			29.8			25.9	
Approach LOS		B			B			C			C	

Intersection Summary

HCM Average Control Delay	19.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	63.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings

11: Seventh St/7th St & Main Street /Main Street

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕			↕↕	
Volume (vph)	23	447	259	42	328	22	106	135	113	31	232	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	13	13	13	14	14	14	11	11	11
Grade (%)		-1%			2%			4%			-1%	
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.947			0.988			0.962			0.983	
Flt Protected		0.998			0.995			0.983			0.992	
Satd. Flow (prot)	0	2773	0	0	1535	0	0	1631	0	0	1448	0
Flt Permitted		0.920			0.627			0.609			0.825	
Satd. Flow (perm)	0	2556	0	0	967	0	0	1011	0	0	1204	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		555			308			456			331	
Travel Time (s)		15.1			8.4			12.4			9.0	
Peak Hour Factor	0.82	0.79	0.81	0.75	0.74	0.46	0.59	0.72	0.79	0.48	0.86	0.58
Heavy Vehicles (%)	0%	3%	1%	0%	1%	0%	4%	3%	4%	0%	1%	0%
Parking (#/hr)		0	0	0	0	0				0	0	0
Adj. Flow (vph)	28	566	320	56	443	48	180	188	143	65	270	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	914	0	0	547	0	0	511	0	0	383	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.19	1.27	1.19	1.11	1.27	1.11	1.08	1.08	1.08	1.19	1.35	1.19
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	5		50	5		50	40		50	40	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	50	5		50	5		50	40		50	40	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	15.0		15.0	15.0		12.0	12.0		12.0	12.0	
Total Split (s)	68.0	68.0		68.0	68.0		60.0	60.0		60.0	60.0	

Lanes, Volumes, Timings
 11: Seventh St/7th St & Main Street /Main Street

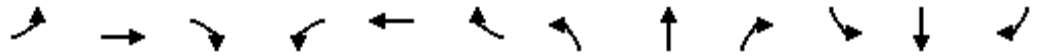
3/9/2015

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	22.0
Total Split (s)	22.0

Lanes, Volumes, Timings

11: Seventh St/7th St & Main Street /Main Street

3/9/2015

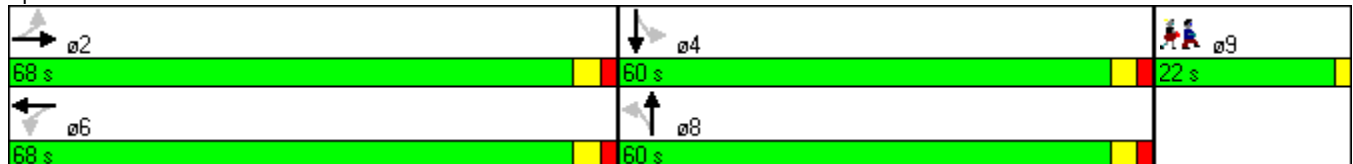


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	45.3%	45.3%		45.3%	45.3%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	63.0	63.0		63.0	63.0		55.0	55.0		55.0	55.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)		3.0			3.0			3.0			3.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		65.0			65.0			57.0			57.0	
Actuated g/C Ratio		0.43			0.43			0.38			0.38	
v/c Ratio		0.82			1.31			1.33			0.84	
Control Delay		34.0			182.8			194.6			59.6	
Queue Delay		3.9			124.9			7.8			0.0	
Total Delay		37.9			307.7			202.4			59.6	
LOS		D			F			F			E	
Approach Delay		37.9			307.7			202.4			59.6	
Approach LOS		D			F			F			E	

Intersection Summary

Area Type: CBD
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.33
 Intersection Signal Delay: 139.8 Intersection LOS: F
 Intersection Capacity Utilization 99.7% ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 11: Seventh St/7th St & Main Street /Main Street



Lanes, Volumes, Timings
11: Seventh St/7th St & Main Street /Main Street

3/9/2015

Lane Group	ø9
Total Split (%)	15%
Maximum Green (s)	20.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	9.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

11: Seventh St/7th St & Main Street /Main Street

3/9/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕			↕↕	
Volume (vph)	23	447	259	42	328	22	106	135	113	31	232	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	13	13	13	14	14	14	11	11	11
Grade (%)		-1%			2%			4%			-1%	
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		0.95			1.00			1.00			1.00	
Frt		0.95			0.99			0.96			0.98	
Flt Protected		1.00			0.99			0.98			0.99	
Satd. Flow (prot)		2775			1535			1631			1447	
Flt Permitted		0.92			0.63			0.61			0.82	
Satd. Flow (perm)		2557			968			1011			1204	
Peak-hour factor, PHF	0.82	0.79	0.81	0.75	0.74	0.46	0.59	0.72	0.79	0.48	0.86	0.58
Adj. Flow (vph)	28	566	320	56	443	48	180	188	143	65	270	48
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	914		0	0	547	0	0	511	0	0	383
Heavy Vehicles (%)	0%	3%	1%	0%	1%	0%	4%	3%	4%	0%	1%	0%
Parking (#/hr)		0	0	0	0	0				0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		63.0			63.0			55.0			55.0	
Effective Green, g (s)		65.0			65.0			57.0			57.0	
Actuated g/C Ratio		0.43			0.43			0.38			0.38	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1108			419			384			458	
v/s Ratio Prot												
v/s Ratio Perm		0.36			c0.57			c0.51			0.32	
v/c Ratio		0.82			1.31			1.33			0.84	
Uniform Delay, d1		37.5			42.5			46.5			42.3	
Progression Factor		0.72			0.76			0.86			1.00	
Incremental Delay, d2		6.5			153.0			160.8			12.5	
Delay (s)		33.5			185.4			200.8			54.8	
Level of Service		C			F			F			D	
Approach Delay (s)		33.5			185.4			200.8			54.8	
Approach LOS		C			F			F			D	

Intersection Summary

HCM Average Control Delay	108.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.32		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	99.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
12: Seventh St & Ann St

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕			↕			↕	
Volume (vph)	0	0	0	44	131	33	148	339	0	0	633	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	16	16	16	16	16	16	10	10	10
Grade (%)		0%			2%			-5%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.978						0.985	
Flt Protected					0.986			0.985				
Satd. Flow (prot)	0	0	0	0	1830	0	0	2138	0	0	1558	0
Flt Permitted					0.986			0.488				
Satd. Flow (perm)	0	0	0	0	1830	0	0	1059	0	0	1558	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)					6						9	
Link Speed (mph)		25			25			35			25	
Link Distance (ft)		273			284			337			456	
Travel Time (s)		7.4			7.7			6.6			12.4	
Peak Hour Factor	0.92	0.92	0.92	0.52	0.82	0.69	0.82	0.80	0.92	0.92	0.91	0.73
Heavy Vehicles (%)	0%	0%	0%	2%	1%	0%	1%	2%	0%	0%	1%	0%
Parking (#/hr)				0	0	0					0	0
Adj. Flow (vph)	0	0	0	85	160	48	180	424	0	0	696	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	293	0	0	604	0	0	784	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	0.86	0.99	0.86	0.82	0.82	0.82	1.09	1.25	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	1		1	1				1
Detector Template												
Leading Detector (ft)				50	5		50	40			40	
Trailing Detector (ft)				0	0		0	0			0	
Detector 1 Position(ft)				0	0		0	0			0	
Detector 1 Size(ft)				50	5		50	40			40	
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)				0.0	0.0		0.0	0.0			0.0	
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					6		3	8			4	
Permitted Phases				6			8					
Detector Phase				6	6		3	8			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	7.0			7.0	
Minimum Split (s)				23.0	23.0		10.5	20.5			20.5	
Total Split (s)				34.0	34.0		10.5	116.0			105.5	

Lanes, Volumes, Timings
12: Seventh St & Ann St

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)				22.7%	22.7%		7.0%	77.3%			70.3%	
Maximum Green (s)				29.0	29.0		5.0	110.5			100.0	
Yellow Time (s)				3.5	3.5		4.0	4.0			4.0	
All-Red Time (s)				1.5	1.5		1.5	1.5			1.5	
Lost Time Adjust (s)					-1.0			-1.0			-1.0	
Total Lost Time (s)					4.0			4.5			4.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Recall Mode				C-Max	C-Max		None	None			None	
Walk Time (s)				7.0	7.0			7.0			7.0	
Flash Dont Walk (s)				11.0	11.0			8.0			8.0	
Pedestrian Calls (#/hr)				14	14			2			2	
Act Effct Green (s)					30.0			111.5			111.5	
Actuated g/C Ratio					0.20			0.74			0.74	
v/c Ratio					0.79			0.77			0.68	
Control Delay					71.9			19.8			10.9	
Queue Delay					0.1			103.7			9.0	
Total Delay					72.0			123.4			19.9	
LOS					E			F			B	
Approach Delay					72.0			123.4			19.9	
Approach LOS					E			F			B	

Intersection Summary

Area Type:	Other
Cycle Length:	150
Actuated Cycle Length:	150
Offset:	115 (77%), Referenced to phase 6:WBTL, Start of Yellow
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.79
Intersection Signal Delay:	66.2
Intersection LOS:	E
Intersection Capacity Utilization:	85.4%
ICU Level of Service:	E
Analysis Period (min):	15

Splits and Phases: 12: Seventh St & Ann St



HCM Signalized Intersection Capacity Analysis

12: Seventh St & Ann St

3/9/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↕			↕			↕		
Volume (vph)	0	0	0	44	131	33	148	339	0	0	633	64	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	12	12	12	16	16	16	16	16	16	10	10	10	
Grade (%)		0%			2%			-5%			0%		
Total Lost time (s)					4.0			4.5			4.5		
Lane Util. Factor					1.00			1.00			1.00		
Frt					0.98			1.00			0.98		
Flt Protected					0.99			0.99			1.00		
Satd. Flow (prot)					1829			2138			1558		
Flt Permitted					0.99			0.49			1.00		
Satd. Flow (perm)					1829			1060			1558		
Peak-hour factor, PHF	0.92	0.92	0.92	0.52	0.82	0.69	0.82	0.80	0.92	0.92	0.91	0.73	
Adj. Flow (vph)	0	0	0	85	160	48	180	424	0	0	696	88	
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	0	0	2	0	
Lane Group Flow (vph)	0	0	0	0	288	0	0	604	0	0	782	0	
Heavy Vehicles (%)	0%	0%	0%	2%	1%	0%	1%	2%	0%	0%	1%	0%	
Parking (#/hr)				0	0	0					0	0	
Turn Type				Perm	NA		pm+pt	NA			NA		
Protected Phases					6		3	8			4		
Permitted Phases				6			8						
Actuated Green, G (s)					29.0			110.5			110.5		
Effective Green, g (s)					30.0			111.5			111.5		
Actuated g/C Ratio					0.20			0.74			0.74		
Clearance Time (s)					5.0			5.5			5.5		
Vehicle Extension (s)					3.0			3.0			3.0		
Lane Grp Cap (vph)					366			788			1158		
v/s Ratio Prot											0.50		
v/s Ratio Perm					0.16			c0.57					
v/c Ratio					0.79			0.77			0.68		
Uniform Delay, d1					57.0			11.5			9.9		
Progression Factor					1.00			1.00			0.85		
Incremental Delay, d2					15.7			4.5			1.1		
Delay (s)					72.6			16.0			9.5		
Level of Service					E			B			A		
Approach Delay (s)		0.0			72.6			16.0			9.5		
Approach LOS		A			E			B			A		
Intersection Summary													
HCM Average Control Delay			22.8									HCM Level of Service	C
HCM Volume to Capacity ratio			0.77										
Actuated Cycle Length (s)			150.0									Sum of lost time (s)	8.5
Intersection Capacity Utilization			85.4%									ICU Level of Service	E
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
13: 6th St & Main Street

3/9/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕				
Volume (vph)	27	584	19	15	323	34	44	65	61	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	16	16	16	11	11	11	12	12	12
Grade (%)		-1%			2%			-1%			0%	
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994			0.986			0.955				
Flt Protected		0.997			0.997			0.988				
Satd. Flow (prot)	0	2945	0	0	1683	0	0	1554	0	0	0	0
Flt Permitted		0.891			0.942			0.988				
Satd. Flow (perm)	0	2632	0	0	1590	0	0	1554	0	0	0	0
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)		4			6							
Link Speed (mph)		35			35			35				35
Link Distance (ft)		308			744			383				229
Travel Time (s)		6.0			14.5			7.5				4.5
Peak Hour Factor	0.61	0.90	0.68	0.63	0.83	0.71	0.79	0.68	0.80	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	2%	0%	0%	0%	0%
Parking (#/hr)		0	0	0	0	0						
Adj. Flow (vph)	44	649	28	24	389	48	56	96	76	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	721	0	0	461	0	0	228	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.19	1.27	1.19	0.99	1.13	0.99	1.19	1.19	1.19	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1				
Detector Template												
Leading Detector (ft)	50	5		50	5		50	40				
Trailing Detector (ft)	0	0		0	0		0	0				
Detector 1 Position(ft)	0	0		0	0		0	0				
Detector 1 Size(ft)	50	5		50	5		50	40				
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Turn Type	Perm	NA		Perm	NA		Perm	NA				
Protected Phases		2			6			4				
Permitted Phases	2			6			4					
Detector Phase	2	2		6	6		4	4				
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0				
Minimum Split (s)	15.0	15.0		15.0	15.0		12.0	12.0				
Total Split (s)	78.0	78.0		78.0	78.0		53.0	53.0				

Lanes, Volumes, Timings
 13: 6th St & Main Street

3/9/2015

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	19.0
Total Split (s)	19.0

Lanes, Volumes, Timings
13: 6th St & Main Street

3/9/2015

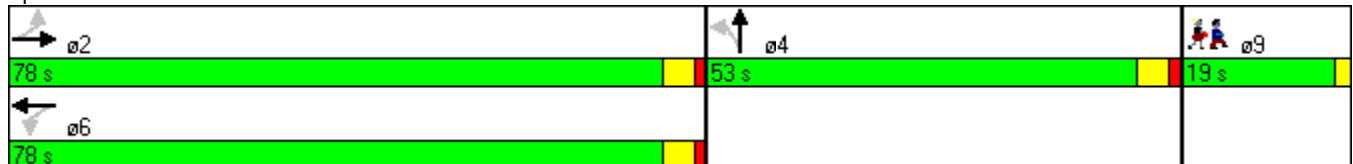


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	52.0%	52.0%		52.0%	52.0%		35.3%	35.3%				
Maximum Green (s)	73.0	73.0		73.0	73.0		48.0	48.0				
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5				
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5				
Lost Time Adjust (s)		-1.0			-1.0			-1.0				
Total Lost Time (s)		4.0			4.0			4.0				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0				
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None				
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		94.4			94.4			28.6				
Actuated g/C Ratio		0.63			0.63			0.19				
v/c Ratio		0.43			0.46			0.77				
Control Delay		8.1			17.7			74.0				
Queue Delay		1.2			0.1			2.3				
Total Delay		9.2			17.9			76.3				
LOS		A			B			E				
Approach Delay		9.2			17.9			76.3				
Approach LOS		A			B			E				

Intersection Summary

Area Type:	CBD
Cycle Length:	150
Actuated Cycle Length:	150
Offset:	28 (19%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.77
Intersection Signal Delay:	22.9
Intersection LOS:	C
Intersection Capacity Utilization:	52.2%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 13: 6th St & Main Street



Lane Group	ø9
Total Split (%)	13%
Maximum Green (s)	17.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	10.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

13: 6th St & Main Street

3/9/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕↕			↕↕			↕↕					
Volume (vph)	27	584	19	15	323	34	44	65	61	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	11	11	11	16	16	16	11	11	11	12	12	12	
Grade (%)		-1%			2%			-1%			0%		
Total Lost time (s)		4.0			4.0			4.0					
Lane Util. Factor		0.95			1.00			1.00					
Frt		0.99			0.99			0.95					
Flt Protected		1.00			1.00			0.99					
Satd. Flow (prot)		2946			1684			1554					
Flt Permitted		0.89			0.94			0.99					
Satd. Flow (perm)		2632			1591			1554					
Peak-hour factor, PHF	0.61	0.90	0.68	0.63	0.83	0.71	0.79	0.68	0.80	0.92	0.92	0.92	
Adj. Flow (vph)	44	649	28	24	389	48	56	96	76	0	0	0	
RTOR Reduction (vph)	0	1	0	0	2	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	720	0	0	459	0	0	228	0	0	0	0	
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	2%	0%	0%	0%	0%	
Parking (#/hr)		0	0	0	0	0							
Turn Type	Perm	NA		Perm	NA		Perm	NA					
Protected Phases		2			6			4					
Permitted Phases	2			6			4						
Actuated Green, G (s)		93.4			93.4			27.6					
Effective Green, g (s)		94.4			94.4			28.6					
Actuated g/C Ratio		0.63			0.63			0.19					
Clearance Time (s)		5.0			5.0			5.0					
Vehicle Extension (s)		3.0			3.0			3.0					
Lane Grp Cap (vph)		1656			1001			296					
v/s Ratio Prot													
v/s Ratio Perm		0.27			0.29			0.15					
v/c Ratio		0.43			0.46			0.77					
Uniform Delay, d1		14.2			14.5			57.6					
Progression Factor		0.51			1.04			1.00					
Incremental Delay, d2		0.3			1.5			11.7					
Delay (s)		7.6			16.4			69.3					
Level of Service		A			B			E					
Approach Delay (s)		7.6			16.4			69.3			0.0		
Approach LOS		A			B			E			A		
Intersection Summary													
HCM Average Control Delay			20.4									HCM Level of Service	C
HCM Volume to Capacity ratio			0.53										
Actuated Cycle Length (s)			150.0									Sum of lost time (s)	27.0
Intersection Capacity Utilization			52.2%									ICU Level of Service	A
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
 14: Ann St & Broad St/5th St & Main Street

3/9/2015



Lane Group	EBT	EBR	NBL2	NBR	SBL	SBT	SBR2	ø9
Lane Configurations	↑↑		↵	↶	↷	↑	↶	
Volume (vph)	570	74	290	655	78	570	348	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	11	10	11	10	10	11	
Grade (%)	-5%					2%		
Storage Length (ft)	0		0		0			
Storage Lanes	0		1		1			
Taper Length (ft)						25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	
Frt	0.983		0.850		0.850			
Flt Protected			0.950		0.950			
Satd. Flow (prot)	*3372	0	1509	1398	*1752	*1793	1377	
Flt Permitted			0.073		0.950			
Satd. Flow (perm)	*3372	0	116	1398	*1752	*1792	1377	
Right Turn on Red					No	No	Yes	
Satd. Flow (RTOR)					382			
Link Speed (mph)	25					25		
Link Distance (ft)	744					298		
Travel Time (s)	20.3					8.2		
Peak Hour Factor	0.92	0.91	0.91	0.96	0.81	0.95	0.91	
Heavy Vehicles (%)	0%	0%	1%	1%	3%	2%	1%	
Adj. Flow (vph)	620	81	319	682	96	600	382	
Shared Lane Traffic (%)								
Lane Group Flow (vph)	701	0	319	682	96	600	382	
Enter Blocked Intersection	No	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	Right	
Median Width(ft)	0					10		
Link Offset(ft)	0					0		
Crosswalk Width(ft)	8					8		
Two way Left Turn Lane								
Headway Factor	1.16	1.16	1.24	1.19	1.26	1.26	1.21	
Turning Speed (mph)	9		9	15	9		9	
Number of Detectors	1	1		1	1	1	1	
Detector Template	Left			Right				
Leading Detector (ft)	40	40		40	40	5	5	
Trailing Detector (ft)	0	0		0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	
Detector 1 Size(ft)	40	40		40	40	5	5	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel								
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	
Turn Type	NA	custom		custom	pm+pt	NA	custom	
Protected Phases	8	1		6	5	2	9	
Permitted Phases			6	2		2 8		
Detector Phase	8	1		6	5	2	2 8	
Switch Phase								
Minimum Initial (s)	7.0	5.0		10.0	5.0	10.0	1.0	

Lanes, Volumes, Timings
 14: Ann St & Broad St/5th St & Main Street

3/9/2015



Lane Group	EBT	EBR	NBL2	NBR	SBL	SBT	SBR2	ø9
Minimum Split (s)	14.0		12.5	16.5	11.5	16.5		22.0
Total Split (s)	36.0		32.4	80.5	11.5	59.6		22.0
Total Split (%)	24.0%		21.6%	53.7%	7.7%	39.7%		15%
Maximum Green (s)	29.0		25.9	74.0	5.0	53.1		20.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0		2.0
All-Red Time (s)	3.0		2.5	2.5	2.5	2.5		0.0
Lost Time Adjust (s)	-2.5		0.0	-2.5	-2.5	-2.5		
Total Lost Time (s)	4.5		6.5	4.0	4.0	4.0		
Lead/Lag			Lead	Lag	Lead	Lag		
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		3.0
Recall Mode	None		None	None	None	C-Max		Ped
Walk Time (s)								7.0
Flash Dont Walk (s)								13.0
Pedestrian Calls (#/hr)								15
Act Effect Green (s)	31.5		85.5	76.5	63.1	55.6		89.1
Actuated g/C Ratio	0.21		0.57	0.51	0.42	0.37		0.59
v/c Ratio	0.99		1.04	0.96	0.13	0.90		0.39
Control Delay	75.1		105.8	60.1	15.0	58.0		2.1
Queue Delay	0.0		0.0	64.0	0.0	15.3		0.0
Total Delay	75.1		105.8	124.1	15.0	73.3		2.1
LOS	E		F	F	B	E		A
Approach Delay	75.1					42.9		
Approach LOS	E					D		

Intersection Summary

Area Type: CBD
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 112 (75%), Referenced to phase 2:SBTL, Start of Yellow
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.04
 Intersection Signal Delay: 78.1
 Intersection LOS: E
 Intersection Capacity Utilization 81.7%
 ICU Level of Service D
 Analysis Period (min) 15
 * User Entered Value

Splits and Phases: 14: Ann St & Broad St/5th St & Main Street



HCM Signalized Intersection Capacity Analysis

14: Ann St & Broad St/5th St & Main Street

3/9/2015



Movement	EBT	EBR	NBL2	NBR	SBL	SBT	SBR2
Lane Configurations	↑↑		↖	↗	↖	↑	↗
Volume (vph)	570	74	290	655	78	570	348
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	10	11	10	10	11
Grade (%)	-5%					2%	
Total Lost time (s)	4.5		6.5	4.0	4.0	4.0	6.5
Lane Util. Factor	0.95		1.00	1.00	1.00	1.00	1.00
Frt	0.98		1.00	0.85	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3372		1509	1398	1752	1793	1377
Flt Permitted	1.00		0.07	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3372		115	1398	1752	1792	1377
Peak-hour factor, PHF	0.92	0.91	0.91	0.96	0.81	0.95	0.91
Adj. Flow (vph)	620	81	319	682	96	600	382
RTOR Reduction (vph)	0	0	0	0	0	0	156
Lane Group Flow (vph)	701	0	319	682	96	600	226
Heavy Vehicles (%)	0%	0%	1%	1%	3%	2%	1%
Turn Type	NA		custom	custom	pm+pt	NA	custom
Protected Phases	8		1	6	5	2	
Permitted Phases			6		2		2 8
Actuated Green, G (s)	29.0		85.5	74.0	58.1	53.1	88.6
Effective Green, g (s)	31.5		85.5	76.5	63.1	55.6	88.6
Actuated g/C Ratio	0.21		0.57	0.51	0.42	0.37	0.59
Clearance Time (s)	7.0		6.5	6.5	6.5	6.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	708		306	713	737	665	813
v/s Ratio Prot	c0.21		c0.18	0.49	0.01	0.33	
v/s Ratio Perm			c0.41		0.05		0.16
v/c Ratio	0.99		1.04	0.96	0.13	0.90	0.28
Uniform Delay, d1	59.1		49.7	35.2	26.6	44.6	15.0
Progression Factor	0.75		1.00	1.00	0.93	0.94	0.88
Incremental Delay, d2	29.8		63.0	23.3	0.1	15.5	0.2
Delay (s)	74.4		112.6	58.5	24.7	57.5	13.3
Level of Service	E		F	E	C	E	B
Approach Delay (s)	74.4					38.9	
Approach LOS	E					D	




















Intersection Summary

HCM Average Control Delay	61.1	HCM Level of Service	E
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	33.0
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
26: Seventh St & 307 EB Exit Ramp

3/9/2015

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	376	0	272	0	0	0	0	157	162	129	431	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			-5%			0%	
Storage Length (ft)	500		0	0		0	0		50	150		0
Storage Lanes	1		0	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850							0.850			
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1770	1583	0	0	0	0	0	1909	1623	1770	1863	0
Flt Permitted	0.950									0.649		
Satd. Flow (perm)	1770	1583	0	0	0	0	0	1909	1623	1209	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		237							176			
Link Speed (mph)		30			30			35			25	
Link Distance (ft)		830			528			178			337	
Travel Time (s)		18.9			12.0			3.5			9.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	409	0	296	0	0	0	0	171	176	140	468	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	409	296	0	0	0	0	0	171	176	140	468	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.97	0.97	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2						2	1	1	2	
Detector Template	Left	Thru						Thru	Right	Left	Thru	
Leading Detector (ft)	20	100						100	20	20	100	
Trailing Detector (ft)	0	0						0	0	0	0	
Detector 1 Position(ft)	0	0						0	0	0	0	
Detector 1 Size(ft)	20	6						6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex						Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94						94			94	
Detector 2 Size(ft)		6						6			6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA						NA	Perm	Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4								2	6		

Lanes, Volumes, Timings
 26: Seventh St & 307 EB Exit Ramp

3/9/2015

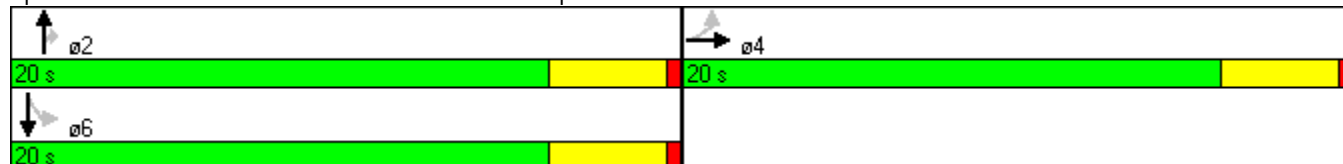


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4						2	2	6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Minimum Split (s)	20.0	20.0						20.0	20.0	20.0	20.0	
Total Split (s)	20.0	20.0						20.0	20.0	20.0	20.0	
Total Split (%)	50.0%	50.0%						50.0%	50.0%	50.0%	50.0%	
Maximum Green (s)	16.0	16.0						16.0	16.0	16.0	16.0	
Yellow Time (s)	3.5	3.5						3.5	3.5	3.5	3.5	
All-Red Time (s)	0.5	0.5						0.5	0.5	0.5	0.5	
Lost Time Adjust (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0						3.0	3.0	3.0	3.0	
Recall Mode	None	None						C-Max	C-Max	C-Max	C-Max	
Act Effect Green (s)	13.9	13.9						18.1	18.1	18.1	18.1	
Actuated g/C Ratio	0.35	0.35						0.45	0.45	0.45	0.45	
v/c Ratio	0.67	0.42						0.20	0.21	0.26	0.55	
Control Delay	16.5	4.6						8.4	2.6	9.6	12.1	
Queue Delay	0.0	0.0						0.0	0.0	0.0	0.0	
Total Delay	16.5	4.6						8.4	2.6	9.6	12.1	
LOS	B	A						A	A	A	B	
Approach Delay		11.5						5.5			11.5	
Approach LOS		B						A			B	

Intersection Summary

Area Type:	Other
Cycle Length:	40
Actuated Cycle Length:	40
Offset:	16 (40%), Referenced to phase 2:NBT and 6:SBTL, Start of Yellow
Natural Cycle:	40
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.67
Intersection Signal Delay:	10.2
Intersection LOS:	B
Intersection Capacity Utilization:	50.2%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 26: Seventh St & 307 EB Exit Ramp



HCM Signalized Intersection Capacity Analysis

26: Seventh St & 307 EB Exit Ramp

3/9/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗						↑	↖	↗	↑	
Volume (vph)	376	0	272	0	0	0	0	157	162	129	431	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			-5%			0%	
Total Lost time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00						1.00	1.00	1.00	1.00	
Frt	1.00	0.85						1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00						1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1583						1909	1623	1770	1863	
Flt Permitted	0.95	1.00						1.00	1.00	0.65	1.00	
Satd. Flow (perm)	1770	1583						1909	1623	1209	1863	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	409	0	296	0	0	0	0	171	176	140	468	0
RTOR Reduction (vph)	0	155	0	0	0	0	0	0	96	0	0	0
Lane Group Flow (vph)	409	141	0	0	0	0	0	171	80	140	468	0
Turn Type	Perm	NA						NA	Perm	Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4								2	6		
Actuated Green, G (s)	13.9	13.9						18.1	18.1	18.1	18.1	
Effective Green, g (s)	13.9	13.9						18.1	18.1	18.1	18.1	
Actuated g/C Ratio	0.35	0.35						0.45	0.45	0.45	0.45	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0						3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	615	550						864	734	547	843	
v/s Ratio Prot		0.09						0.09			c0.25	
v/s Ratio Perm	c0.23								0.05	0.12		
v/c Ratio	0.67	0.26						0.20	0.11	0.26	0.56	
Uniform Delay, d1	11.1	9.4						6.6	6.3	6.8	8.0	
Progression Factor	1.00	1.00						1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.7	0.2						0.5	0.3	1.1	2.6	
Delay (s)	13.8	9.6						7.1	6.6	7.9	10.6	
Level of Service	B	A						A	A	A	B	
Approach Delay (s)		12.0			0.0			6.8			10.0	
Approach LOS		B			A			A			B	



















Intersection Summary

HCM Average Control Delay	10.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	50.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Capacity Analysis
 26: Seventh St & 307 EB Exit Ramp

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	376	0	272	0	0	0	0	157	162	129	431	0
Movement Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Queue, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj. Factor (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking, Bus Adj. Factors	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Sat. Flow Rate, veh/h/ln	1863	1900	1863	1900	1900	1900	1900	1909	1909	1863	1863	1900
Lanes	1	1	0	0	0	0	0	1	1	1	1	0
Lane Assignment												
Capacity, veh/h	180	0	561	0	0	0	0	864	734	662	843	0
Proportion Arriving On Green	0.35	0.00	0.35	0.00	0.00	0.00	0.00	0.45	0.45	0.39	0.39	0.00
Movement Delay, s/veh	609.1	0.0	11.3	0.0	0.0	0.0	0.0	7.1	7.5	9.6	10.8	0.0
Movement LOS	F		B					A	A	A	B	
Approach Volume, veh/h		704			0			347			609	
Approach Delay, s/veh		358.2			0.0			7.3			10.5	
Approach LOS		F						A			B	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phase			2		4		6					
Case No			7.0		6.0		6.0					
Phase Duration (G+Y+Rc), s			22.10		17.90		22.10					
Change Period (Y+Rc), s			4.00		4.00		4.00					
Max. Allowable Headway (MAH), s			4.93		2.32		4.93					
Maximum Green Setting (Gmax), s			18.10		13.90		18.10					
Max. Queue Clearance Time (g_c+I1), s			4.67		15.90		9.80					
Green Extension Time (g_e), s			4.46		0.00		3.37					
Probability of Phase Call (p_c)			1.000		1.000		1.000					
Probability of Max Out (p_x)			0.300		1.000		0.621					
Left-Turn Movement Data												
Assigned Movement					7		1					
Mvmt. Sat Flow, veh/h					1774.04		1209.48					
Through Movement Data												
Assigned Movement			2		4		6					
Mvmt. Sat Flow, veh/h			1909.31		0.00		1862.75					
Right-Turn Movement Data												
Assigned Movement			12		14		16					
Mvmt. Sat Flow, veh/h			1622.92		1615.00		0.00					
Left Lane Group Data												
Assigned Movement		0	0	0	7	0	1	0	0			
Lane Assignment					L		L					
Lanes in Group		0	0	0	1	0	1	0	0			
Group Volume (v), veh/h		0.0	0.0	0.0	408.7	0.0	140.2	0.0	0.0			
Group Sat. Flow (s), veh/h/ln		0.0	0.0	0.0	1774.0	0.0	1209.5	0.0	0.0			
Queue Serve Time (g_s), s		0.0	0.0	0.0	0.0	0.0	3.4	0.0	0.0			
Cycle Queue Clear Time (g_c), s		0.0	0.0	0.0	13.9	0.0	5.5	0.0	0.0			

HCM 2010 Signalized Intersection Capacity Analysis
 26: Seventh St & 307 EB Exit Ramp

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Perm LT Sat Flow Rate (s_l), veh/h/ln	0.0	0.0	0.0	1774.0	0.0	1209.5	0.0	0.0
Shared LT Sat Flow (s_sh), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Eff. Green (g_p), s	0.0	0.0	0.0	13.9	0.0	18.1	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	16.0	0.0	0.0
Perm LT Que Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	3.4	0.0	0.0
Time to First Blk (g_f), s	0.0	18.1	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Proportion LT Inside Lane (P_L)	0.000	0.000	0.000	1.000	0.000	1.000	0.000	0.000
Lane Group Capacity (c), veh/h	0.0	0.0	0.0	180.0	0.0	662.3	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.000	0.000	2.271	0.000	0.212	0.000	0.000
Available Capacity (c_a), veh/h	0.0	0.0	0.0	180.0	0.0	662.3	0.0	0.0
Upstream Filter Factor (I)	0.000	0.000	0.000	1.000	0.000	0.682	0.000	0.000
Uniform Delay (d1), s/veh	0.0	0.0	0.0	20.0	0.0	9.1	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.0	0.0	589.1	0.0	0.5	0.0	0.0
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	609.1	0.0	9.6	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.0	0.0	1.5	0.0	0.8	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.0	0.0	29.5	0.0	0.1	0.0	0.0
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile bk-of-que factor (f_B%)	0.000	0.000	0.000	1.000	0.000	1.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.0	0.0	30.9	0.0	0.9	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.00	0.00	1.57	0.00	0.15	0.00	0.00
Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Queue (Qe), veh	0.0	0.0	0.0	57.2	0.0	0.0	0.0	0.0
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Clear Time (tc), h	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Movement	0	2	0	4	0	6	0	0
Lane Assignment	T			T				
Lanes in Group	0	1	0	0	0	1	0	0
Group Volume (v), veh/h	0.0	170.7	0.0	0.0	0.0	468.5	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	1909.3	0.0	0.0	0.0	1862.7	0.0	0.0
Queue Serve Time (g_s), s	0.0	2.1	0.0	0.0	0.0	7.8	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	2.1	0.0	0.0	0.0	7.8	0.0	0.0
Lane Group Capacity (c), veh/h	0.0	864.0	0.0	0.0	0.0	842.9	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.198	0.000	0.000	0.000	0.556	0.000	0.000
Available Capacity (c_a), veh/h	0.0	864.0	0.0	0.0	0.0	842.9	0.0	0.0
Upstream Filter Factor (I)	0.000	1.000	0.000	0.000	0.000	0.682	0.000	0.000
Uniform Delay (d1), s/veh	0.0	6.6	0.0	0.0	0.0	9.0	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.5	0.0	0.0	0.0	1.8	0.0	0.0
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	7.1	0.0	0.0	0.0	10.8	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.6	0.0	0.0	0.0	2.5	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.4	0.0	0.0
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile bk-of-que factor (f_B%)	0.000	1.000	0.000	1.000	0.000	1.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.7	0.0	0.0	0.0	2.9	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.14	0.00	0.00	0.00	0.25	0.00	0.00

HCM 2010 Signalized Intersection Capacity Analysis
 26: Seventh St & 307 EB Exit Ramp

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Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Queue (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Movement	0	12	0	14	0	16	0	0
Lane Assignment		R		T+R				
Lanes in Group	0	1	0	1	0	0	0	0
Group Volume (v), veh/h	0.0	176.1	0.0	295.7	0.0	0.0	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	1622.9	0.0	1615.0	0.0	0.0	0.0	0.0
Queue Serve Time (g_s), s	0.0	2.7	0.0	5.8	0.0	0.0	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	2.7	0.0	5.8	0.0	0.0	0.0	0.0
Prot RT Sat Flow Rate (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff. Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Proportion RT Outside Lane (P_R)	0.000	1.000	0.000	1.000	0.000	0.000	0.000	0.000
Lane Group Capacity (c), veh/h	0.0	734.4	0.0	561.2	0.0	0.0	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.240	0.000	0.527	0.000	0.000	0.000	0.000
Available Capacity (c_a), veh/h	0.0	734.4	0.0	561.2	0.0	0.0	0.0	0.0
Upstream Filter Factor (I)	0.000	1.000	0.000	1.000	0.000	0.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	6.7	0.0	10.4	0.0	0.0	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.8	0.0	0.9	0.0	0.0	0.0	0.0
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	7.5	0.0	11.3	0.0	0.0	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.6	0.0	2.6	0.0	0.0	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile bk-of-que factor (f_B%)	0.000	1.000	0.000	1.000	0.000	1.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.7	0.0	2.8	0.0	0.0	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.38	0.00	0.09	0.00	0.00	0.00	0.00
Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Queue (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM Average Control Delay	157.4
HCM Level of Service	F

Alternative 2B Signalized Intersection Traffic/LOS Summary (Design Year Build 2045)

Intersection	AM Volume	PM Volume	AM LOS	PM LOS	
Broad St. at I80WB On/Off Ramps	1301	1973	A	A	
Dreher Ave/School Drive & Main St	2095	2406	F	F	
9th St & Main St.	1436	1674	D	F	
8th St & Main St / Main St	1339	1291	C	C	
Seventh St/7th St & Main St/Main St	1551	1766	F	F	
Seventh St. & Ann St.	1209	1392	F	E	
6th St & Main St.	1068	1172	B	C	
Ann St & Broad St/5th St & Main St (Five Points)	2000	2585	D	E	WORST CASE
Seventh St & I80 EB On/Off Ramps	1311	1527	B	B	

I-80 Mainline AADT Volumes

Location	2013 ADT	2025 ADT (No Build)	2045 ADT (No Build)	2045 ADT Build Alt 2A	2045 ADT Build Alt 2B	2045 ADT Build Alt 2D
MAINLINE I-80 SEGMENTS						
EASTBOUND						
I-80 EB between Int. 303 and 304	22,940	29,093	43,231	44,110	39,051	44,457
I-80 EB between Int. 304 and 305	33,490	42,473	63,113	63,950	64,742	64,742
I-80 EB between Int. 305 and 306	33,287	42,216	62,731	57,680	64,742	64,742
I-80 EB between Int. 306 and 307	34,766	44,092	65,518	65,519	64,742	64,742
WESTBOUND						
I-80 WB between Int. 303 and 304	24,404	30,950	45,990	45,870	43,314	49,083
I-80 WB between Int. 304 and 305	35,181	44,618	66,300	61,915	66,553	66,553
I-80 WB between Int. 305 and 306	34,185	43,355	64,423	67,330	66,553	66,553
I-80 WB between Int. 306 and 307	35,689	45,262	67,257	67,260	66,553	66,553
BOTH DIRECTIONS (TOTAL)						
I-80 between Int. 303 and 304	47,344	60,043	89,222	89,980	82,365	93,540
I-80 between Int. 304 and 305	68,671	87,091	129,413	125,865	131,295	131,295
I-80 between Int. 305 and 306	67,472	85,571	127,154	125,010	131,295	131,295
I-80 between Int. 306 and 307	70,455	89,354	132,775	132,814	131,295	131,295

For Alternative 2D, the Exit 304 WB on-ramp and the new Exit 303 WB off-ramp form an auxiliary lane. The weave analysis for this section indicates it will operate at an acceptable LOS C or better.

Table 10: 2045 Build Peak Hour Levels Of Service, Freeway Segments

Location	AM Peak Hour				PM Peak Hour			
	No Build	Build Option 2A	Build Option 2B	Build Option 2D	No Build	Build Option 2A	Build Option 2B	Build Option 2D
I-80 EB between Int. 302 and 303	D	D	D	D	E	E	E	E
I-80 EB between Int. 303 and 304	C	B	B	B	E	C	C	C
I-80 EB between Int. 304 and 305	F	C	C	C	F	C	D	D
I-80 EB between Int. 305 and 306	F	B	D	D	F	C	C	C
I-80 EB between Int. 306 and 307	F				F			
I-80 EB between Int. 307 and 308	F	C	C	C	F	C	C	C
I-80 WB between Int. 308 and Int. 307	E	B	B	B	F	E	E	E
I-80 WB between Int. 307 and 306	E	C	B	B	F	E	E	E
I-80 WB between Int. 306 and 305	D				F			
I-80 WB between Int. 305 Diverge and 304 Diverge	-	B	-	-	-	D	-	-
I-80 WB between Int. 305 and 304	D	B	B	B	F	D	C	D
I-80 WB between Int. 305 Merge and 304 Merge	-	-	B	B	-	-	D	D
I-80 WB Ramp/Auxiliary Int. 304 to Int. 303 Exit	-	-	A	-	-	-	A	-
I-80 WB between Int. 304 and 303 (Mainline)	C	B	B	C	F	D	D	C
I-80 WB between Int. 303 and 302	C	C	C	C	F	F	F	F
X – LOS (Freeway Segment) according to HCS+™								
X – LOS (Weave) according to HCS+™								

Table 11: 2045 Build Peak Hour Levels Of Service, Ramp Merges

Location	AM PEAK HOUR				PM PEAK HOUR			
	No Build	Build Option 2A	Build Option 2B	Build Option 2D	No Build	Build Option 2A	Build Option 2B	Build Option 2D
I-80 EB Int. 303 from Rt. 611	x	B	A	aux	x	C	B	aux
I-80 EB Int. 304 from US209	F	aux	C	C	F	aux	D	D
I-80 EB Int. 304 from Bus 209	x	x	aux	aux	x	x	aux	aux
I-80 EB Int. 305 from W. Main St.	F	aux	r	r	F	aux	r	r
I-80 EB Int. 306 from Dreher Ave.	F	r	r	r	F	r	r	r
I-80 EB Int. 307 from Park Ave.	F	aux	aux	aux	F	aux	aux	aux
I-80 WB Int. 303 from Rt. 611	B	B	B	B	D	D	D	D
I-80 WB Int. 304 from US209	x	x	aux	aux	x	x	aux	aux
I-80 WB Int. 305 from Main St	aux	B	A	A	aux	D	C	C
I-80 WB Int. 307 from Broad St.	E	aux	aux	aux	F	aux	aux	aux

aux–auxiliary lane provided
 r – eliminated ramp
 x – does not exist in this alternative

Table 12: 2045 Build Peak Hour Levels Of Service, Ramp Diverges

Location	AM PEAK HOUR				PM PEAK HOUR			
	No Build	Build Option 2A	Build Option 2B	Build Option 2D	No Build	Build Option 2A	Build Option 2B	Build Option 2D
I-80 EB Int. 303 to Rt. 611	D	A	B	B	F	B	C	C
I-80 EB Int. 305 to W. Main St.	F	aux	r	r	F	aux	r	r
I-80 EB Int. 307 to Park Avenue	F	aux	aux	aux	F	aux	aux	aux
I-80 WB Int. 303 to Rt. 611	x	B	c-d aux	aux	x	C	c-d aux	aux
I-80 WB Int. 304 to Rt. 209	aux	aux	aux	aux	aux	aux	aux	aux
I-80 WB Int. 305 to W. Main St.	E	B	B	B	F	D	D	D
I-80 WB Int. 306 to Dreher Ave.	E	r	r	r	F	r	r	r
I-80 WB Int. 307 to Broad St.	E	aux	aux	aux	F	aux	aux	aux

aux –auxiliary lane provided
 r – eliminated ramp
 x – does not exist in this alternative

Table 13: 2045 Build Peak Hour Levels Of Service, Ramp Terminus Intersections

Intersection	AM PEAK HOUR				PM PEAK HOUR			
	No Build	Build Option 2A	Build Option 2B	Build Option 2D	No Build	Build Option 2A	Build Option 2B	Build Option 2D
Int 303 Connector / I-80 EB Ramps (U)	x	C (15.3)	C (15.3)	C (15.3)	x	D (27.9)	D (27.9)	D (27.9)
Int 303 Connector / I-80 WB Ramps (U)	x	B (10.2)	B (10.2)	B (10.2)	x	B (12.0)	B (12.0)	B (12.0)
Int 303 Connector /PA611 /Shophe Center Dr (S)	x	x	x	C (22.2)	x	x	x	D (38.2)
Loop Access Rd /PA611 (Alt A1, B1 Only) (S)	x	C (24.5)	C (24.5)	x	x	C (34.0)	C (34.0)	x
I-80 EB Int 304 Off Ramp/US209 SB On Ramp /W. Main St (S)	x	x	B (15.2)	B (15.2)	x	x	C (30.2)	C (30.2)
I-80 EB Int 304 On Ramp /US209 NB Off Ramp / W. Main St (S)	x	x	B (19.4)	B (19.4)	x	x	C (29.5)	C (29.5)
W. Main St. /I-80 EB Int. 305 Ramps (U)	D (29.0)	x	x	x	F (1206)	x	x	x
Dreher Connector Rd / I-80 EB Int. 305 Ramps (U)	x	D (25.2)	x	x	x	D (33.8)	x	x
W. Main St. / I-80 WB Int. 305 Ramps (S)	C (24.6)	C (23.6)	C (22.8)	C (22.8)	D (47.0)	C (20.5)	C (23.6)	C(23.6)
Dreher Ave. Connector/ W. Main St. (S)	x	B (11.9)	B (14.1)	B (14.1)	x	B (10.9)	B (12.5)	B (12.5)
Dreher Ave. Connector / Dreher Ave. (U)	x	C(15.6)	B (10.4)	B (10.4)	x	B (13.1)	B (12.2)	B (12.2)
Dreher Ave. / I-80 EB Int. 306 On Ramp	B (10.1)	x	x	x	A (9.8)	x	x	x
Dreher Ave. / I-80 WB Int. 306 Off Ramp	B (13.8)	x	x	x	A (12.9)	x	x	x
PA611 /I-80 EB Int. 307 Ramp ((U - No Build and Alt 2A, S - Alt 2B and 2D)	D (29.2)	D (29.2)	B (16.6)	B (16.6)	D (32.4)	D (32.4)	B (16.6)	B (16.6)
Broad St. /I-80 WB Int. 307 Ramps (S)	C (30.1)	C (27.8)	C (34.5)	C (34.5)	B (12.9)	D (42.5)	D (53.2)	D (53.2)
Broad St. /I-80 EB Int. 307 On Ramp (U)	x	A (9.7)	x	x		B (10.5)	x	x

(S) Signalized Intersection – Synchro LOS results reported are HCM 2010. LOS (average delay/vehicle)

(U) Unsignalized intersection LOS results reported are worst case stop-controlled approach (average delay/vehicle)

x – intersection does not exist for the alternative

APPENDIX D
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 characteristics (surface roughness) for the project were 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. Based on PennDOT's Publication #321 Project Level Air Quality Handbook, a background concentration of 3.0 ppm was assumed and added to the CO concentrations predicted by the computer modeling effort for existing and build conditions. Additionally, 0.7 persistence factor was used to project 8-hour CO concentrations, with an assumed background concentration of 1.5 ppm, as stipulated in PennDOT and EPA guidance.
4. In support of the MOVES model, data was obtained from PennDOT. The data provided includes fuel information, age distribution by vehicle class, vehicle population by vehicle class, as well as other general support data.
5. For the MOVES models, the peak hour traffic volumes and the posted speed for that hour were used, which represent the system wide worst case traffic. 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 population data set provided by PennDOT.
6. 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.

APPENDIX E
REFERENCES

Reference Materials Used For Air Quality Analysis

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APPENDIX F
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