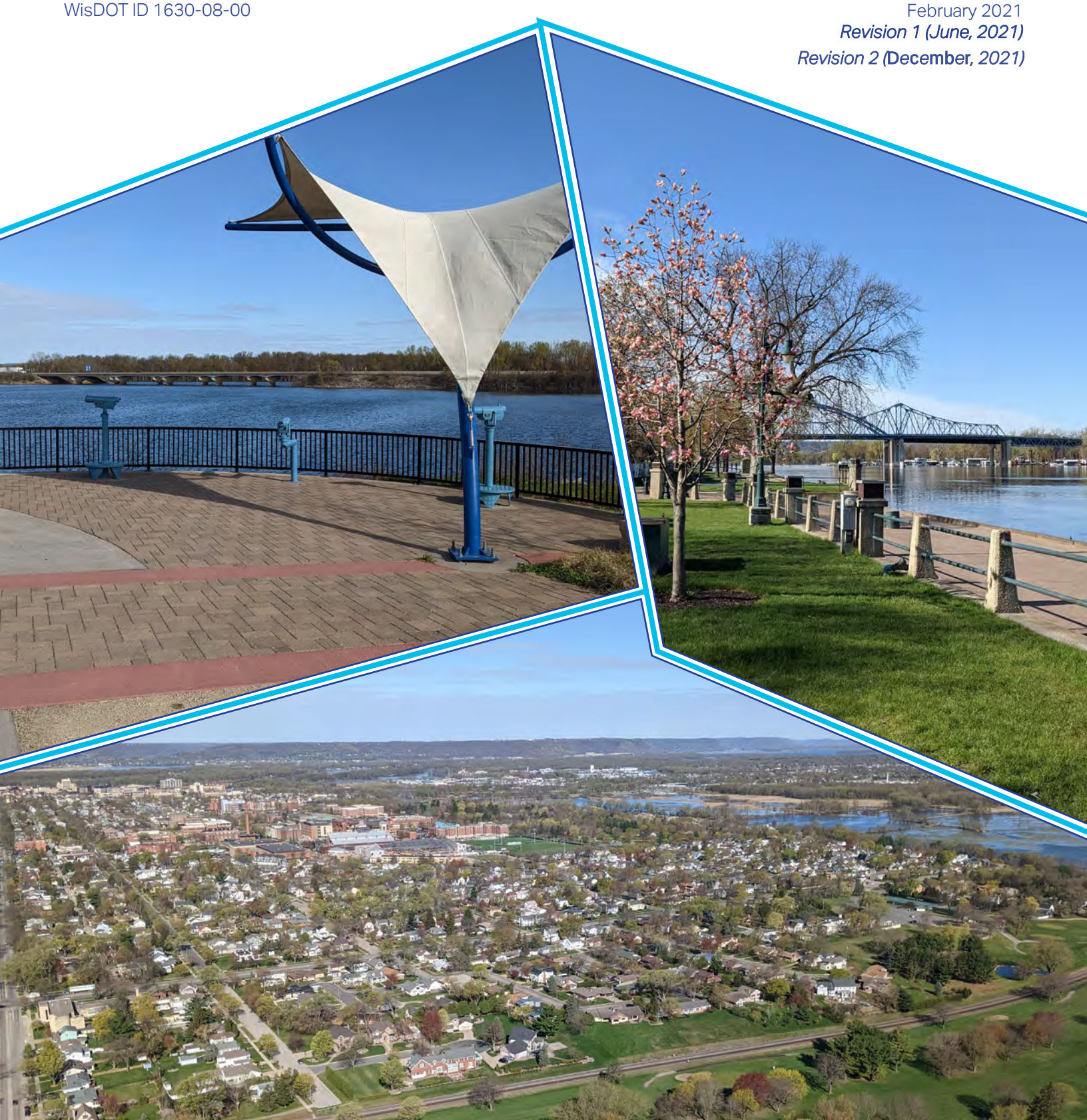
La Crosse Safety and Operations Study

Existing Conditions Report

WisDOT ID 1630-08-00

February 2021
Revision 1 (June, 2021)
Revision 2 (December, 2021)



Executive Summary

WisDOT has initiated a Safety & Operations study of major north-south roadways within the City of La Crosse. Roadways included in the study include segments of US 53, WIS 35, WIS 16, US 14 / US 61, and Losey Boulevard, as shown in Figure 1

The objectives of this study are to gather new data for project roadways, identify current and future safety and operational concerns, and identify and evaluate improvement alternatives that address these concerns. This study will include evaluation of one improvement alternative identified in previous planning efforts, including the anticipated change in regional traffic patterns. It is anticipated the results of this study will be used to determine whether WisDOT should continue with an improvement alternative from previous planning studies or make improvements along existing highways at critical locations.

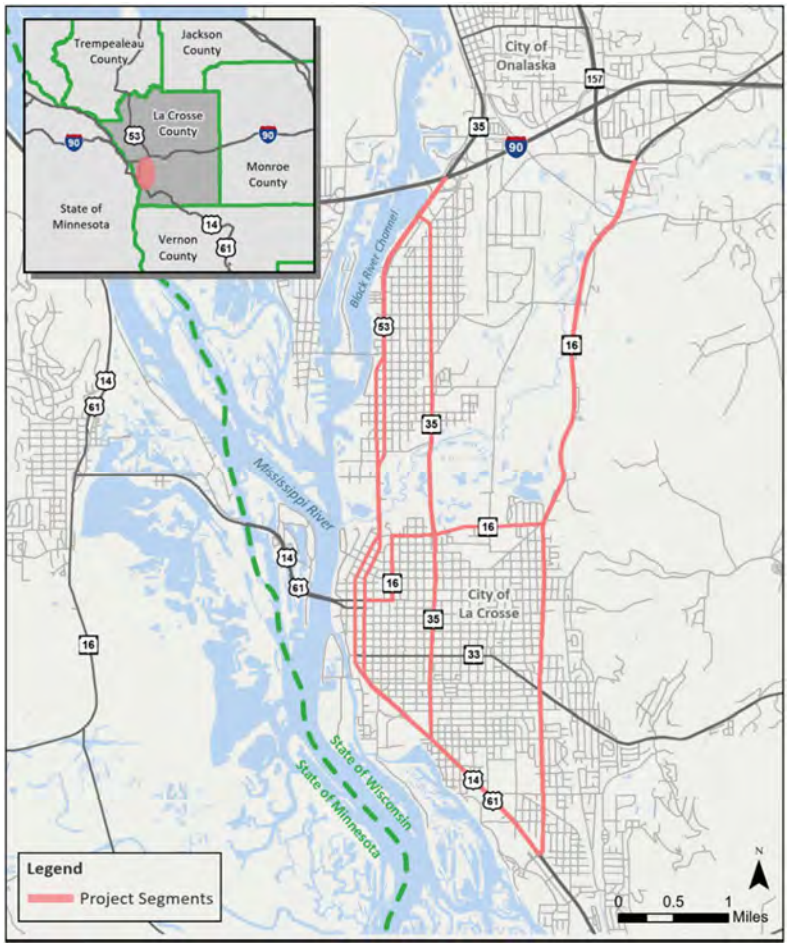


Figure 1: Project Location Map

The purpose of the existing conditions report is to document the current conditions for project roadways, including the conditions in each of the following technical areas:

- ***Traffic operational characteristics***
- ***Structural Conditions***
- ***Historical Crash Frequency***
- ***Pavement Conditions***

This report will also document the methodology used for project engineering evaluations. Existing conditions data and evaluation results from this report will provide a baseline for future comparisons.

As WisDOT develops plans for future improvements to project roadway segments in the City of La Crosse, several deficiencies identified in this report should be taken into account. These deficiencies are summarized below:

Project Segment	 *Traffic Congestion*	 *Safety Concerns*	 *Structure Deficiencies*	 *Pavement Needs*
WIS 16	✓	✓	✓	✓
Primary Concern: 58% of this segment and five intersections have safety concerns, including two of the top 10 intersections for crash frequency. Secondary Concern: Traffic congestion anticipated at the WIS 16 intersections with County B and Gillette St.				
WIS 35 (Lang Dr, George St)		✓	✓	✓
Primary Concern: 61% of this segment and eight intersections have safety concerns. Secondary Concern: 28% of this segment has a projected PCI pavement rating of "poor."				
US 53 (Rose St, Copeland Ave)	✓	✓	✓	✓
Primary Concern: Seven intersections have safety concerns. Secondary Concern: 38% of this segment has a projected IRI pavement rating of "poor."				
WIS 16 (La Crosse St)	✓	✓		✓
Primary Concern: 97% of this segment and 12 intersections have safety concerns, including one of the top 10 intersections for crash frequency. Secondary Concern: 26% of this segment has a projected IRI pavement rating of "poor."				
Losey Blvd	✓	✓		✓
Primary Concern: 31% of this segment has safety concerns.				
WIS 35 (West Ave)	✓	✓		✓
Primary Concern: 74% of this segment has safety concerns and five intersections have safety concerns, including three of the top 10 intersections for crash frequency. Secondary Concern: Three intersections have bicycle crash concerns.				
Downtown	✓	✓		✓
Primary Concern: 84% of this segment and 18 intersections have safety concerns, including three of the top 10 intersections for crash frequency. Secondary Concern: Traffic congestion occurs at the US 53 & La Crosse St intersection and at the Market St intersections with US 14/61 SB (3rd St) and US 14/61 NB (4th St).				
US 14/61 (South Ave, Mormon Coulee Rd)		✓		✓
Primary Concern: Three intersections have safety concerns, including one of the Top 10 intersections for crash frequency.				

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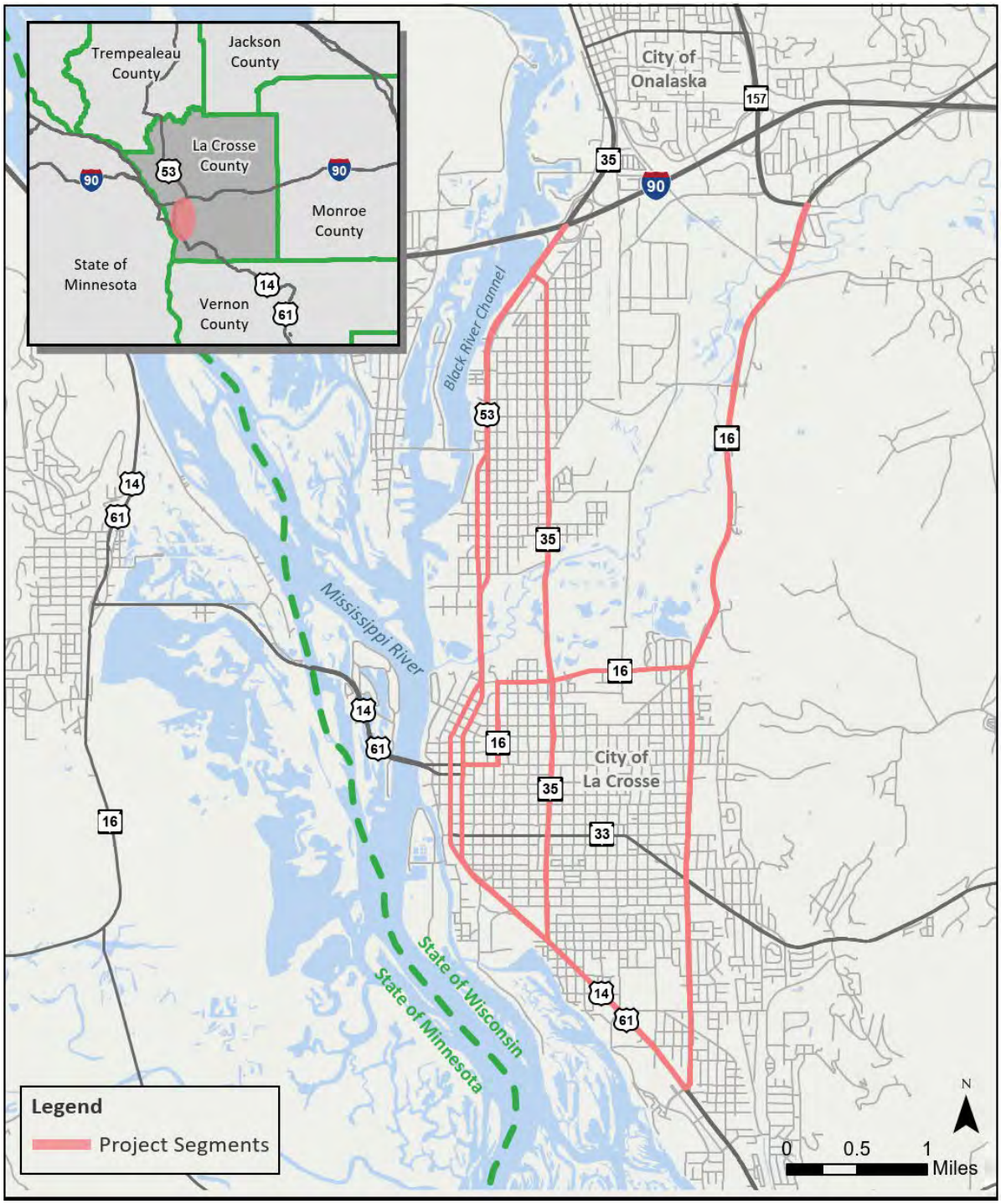
1. Introduction

WisDOT has initiated a Safety & Operations study of major north-south roadways within the City of La Crosse. The study includes roadway segments along US 53, WIS 35, WIS 16, US 14 / US 61, and Losey Boulevard. The roadway segments included in the study are in Figure 1: Project Location Map.

Figure 1: Project Location Map



1.1 Study History

The arterial roadway system in the La Crosse area has been studied on multiple occasions in recent decades. The La Crosse North-South Transportation Corridor Study, a study which culminated in an Environmental Impact Statement (EIS), was completed by WisDOT in the late 1990's. Following completion of the study, funding was enumerated by the Transportation Projects Commission in 1998 to implement the recommended improvements in the EIS. Ultimately, local opposition to the project prevented the project from moving forward to design and construction.

In 2006, WisDOT initiated the Coulee Connections Study. The purpose of this study was to re-examine congestion and safety concerns along project roadways and re-evaluate improvement recommendations in the original EIS.

In a 2015 continuation of the Coulee Connections Study, WisDOT initiated a Planning and Environmental Linkages (PEL) Study for the project area. Labeled the *Coulee Region Transportation Study*, this phase of the study was paused in 2016 following submittal of the Draft Progress Report (September, 2016).

1.2 Study Objectives

As identified in previous regional transportation planning efforts, the geographic and topographical constraints of the La Crosse area have a limiting impact when considering improvement options. The City of La Crosse is bordered by the Mississippi and Black Rivers to the west and steep bluffs to the east and is bisected by the La Crosse River and its system of wetlands. Many of the major destinations within the City (downtown area, UW – La Crosse, Gundersen and Mayo medical campuses) are south of the La Crosse River, and much of the traffic accessing these destinations originates from north of the La Crosse River (northern La Crosse, Onalaska, Holmen, other locations via I-90). Due to geographic constraints, all north-south traffic is funneled to three arterials - US 53, WIS 35, and WIS 16, and two intersections – US 53 & WIS 35 and WIS 16 & WIS 157. No alternate routes are available if one or all these arterials and/or intersections experience congestion.

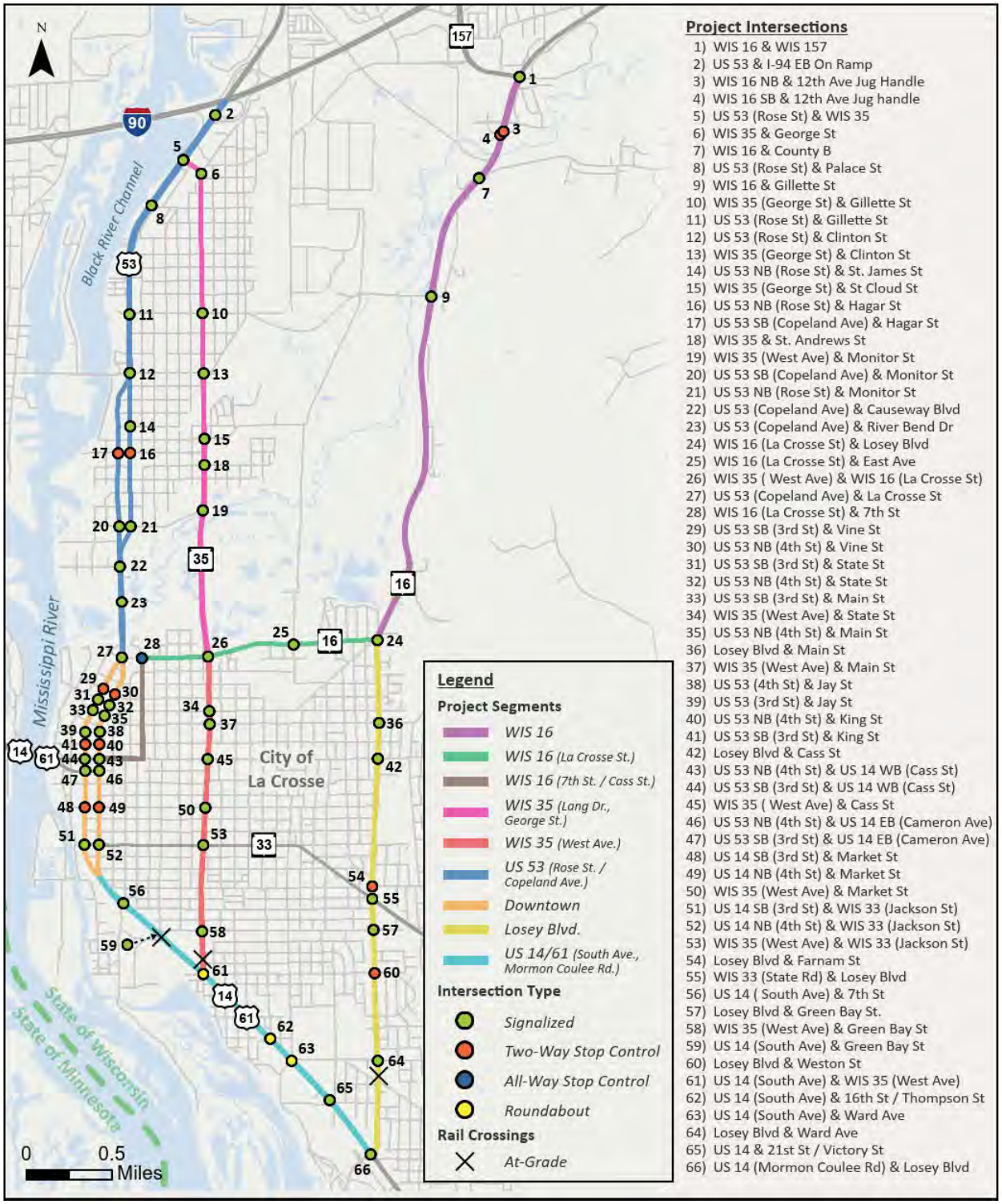
The objectives of this study are to gather new data for project roadways, identify current and future safety and operational concerns, and identify and evaluate improvement alternatives that address these concerns. This study will include evaluation of one improvement alternative identified in previous planning efforts, including the anticipated change in regional traffic patterns. It is anticipated the results of this study will be used to determine whether WisDOT should continue with an improvement alternative from previous planning studies or make improvements along existing highways at critical locations.

The purpose of the existing conditions report is to document the current conditions for project roadways, including traffic operational characteristics, historical crash frequency, structural conditions, and pavement conditions. This report will also document the methodology used for project engineering evaluations. Existing conditions data and evaluation results from this report will provide a baseline for future comparisons.

2. Project Limits

For the purposes of this study, project roadways were divided into segments. Project segments and project intersections within those segments are in Figure 2: Project Segments.

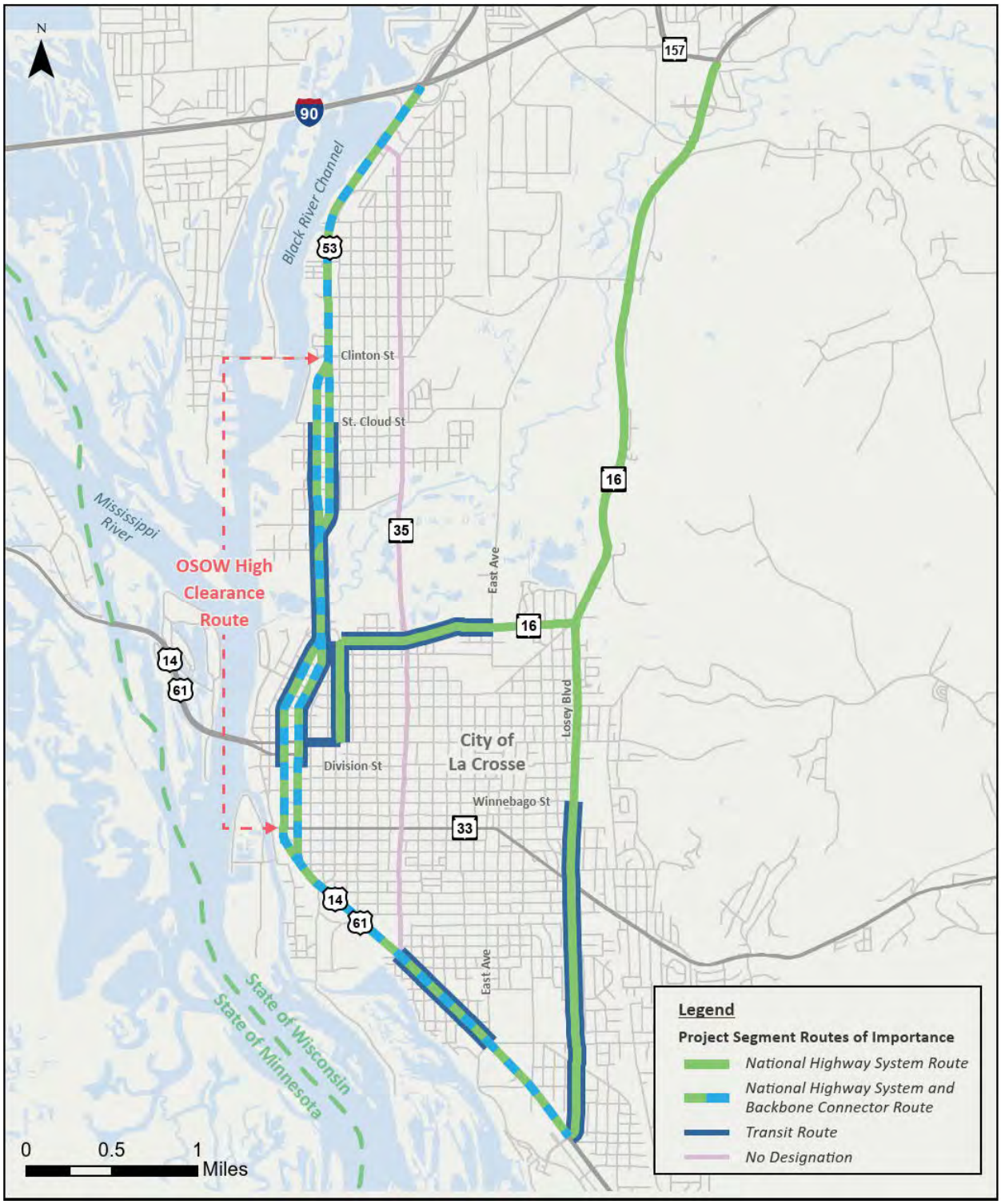
Figure 2: Project Segments



The WIS 16 (7th St / Cass St) segment was not originally included in the scope of this study. Evaluation of this segment is not included in this study but will be included in future study phases.

Several project segments are designated as National Highway System (NHS) routes, Backbone Connector Routes, or transit routes. These designations are in Figure 3: Routes of Importance.

Figure 3: Routes of Importance



A field review of project segments was completed in June, 2020 to observe traffic behavior and confirm existing lane configurations and traffic control. As part of the field review, GoPro video of each project segment was obtained and uploaded to a private Youtube location. Links to these videos are in Table 1: Project Segment Video Links

Table 1: Project Segment Video Links

Highway	Limits	NB/EB Link	SB/WB Link
US 14/61	Losey Blvd to Cass St	https://youtu.be/69lHC2tg5Cc	https://youtu.be/OmFSU2vJw2o
Losey Blvd	US 14/61 to WIS 16	https://youtu.be/w1t1S_CVBfg	https://youtu.be/IgTZPL5OTOw
WIS 35	US 14/61 to WIS 16	https://youtu.be/0qoZHQg-pqo	https://youtu.be/_8xOZ7fShy4
WIS 35	WIS 16 to US 53	https://youtu.be/_yRUgJA3GyQ	https://youtu.be/lC6MwtqzhVQ
US 53	Cass St to La Crosse St	https://youtu.be/3R9dqVhAF1Q	https://youtu.be/qbwuSivt2gs
US 53	La Crosse St to I-90	https://youtu.be/ze6Ph2-79cc	https://youtu.be/GWNQkJrQmig
WIS 16	US 53 to Losey Blvd	https://youtu.be/m_4X0EUUZE8	https://youtu.be/BdPmVNne2MU
WIS 16	Losey Blvd to WIS 157	https://youtu.be/DDyGcOfYkxU	https://youtu.be/VjnzODII48k

A summary of project roadway attributes is in Table 2: Roadway Attributes.

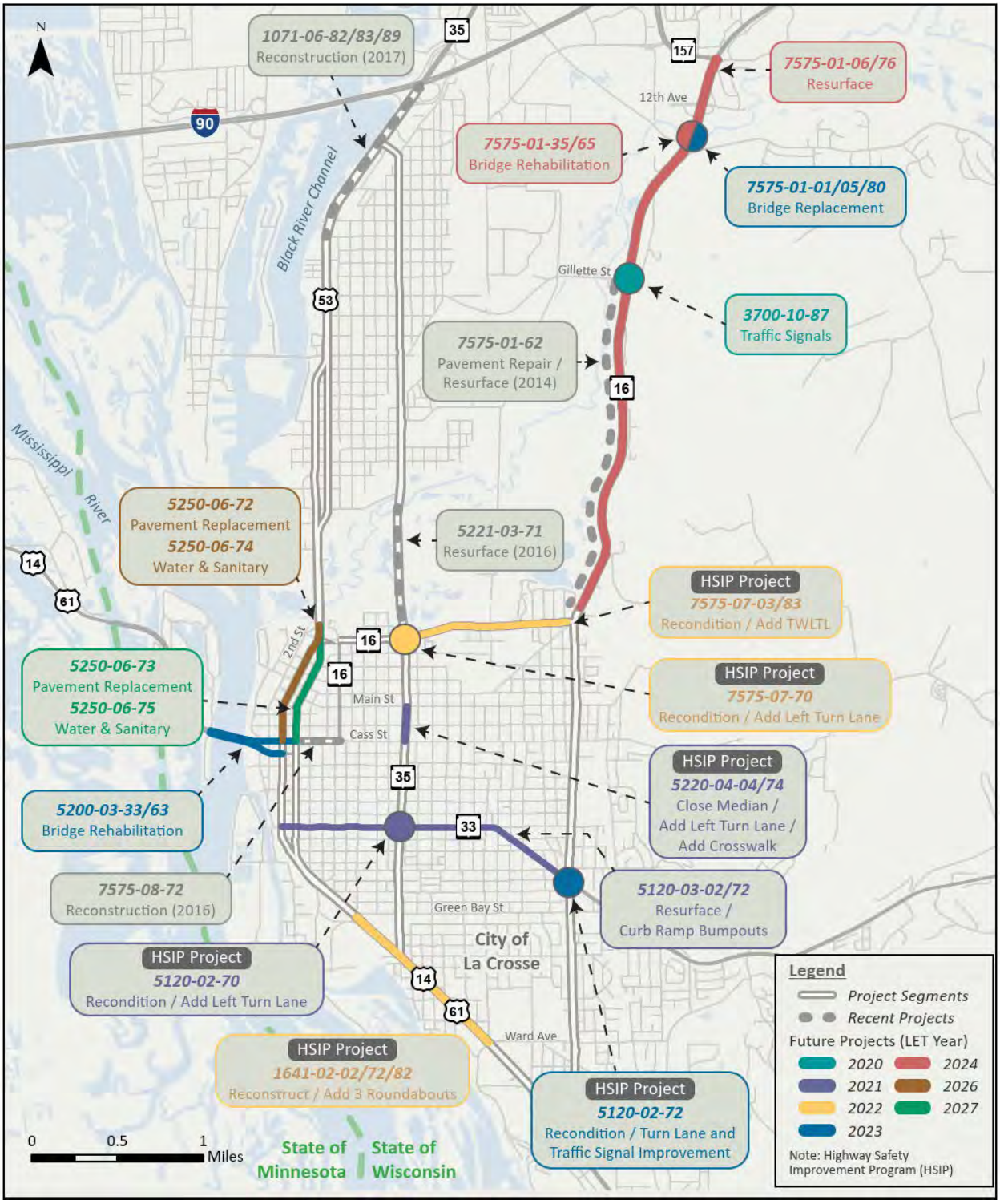
Table 2: Roadway Attributes

Project Segment	Speed Limit	Typical Section	2017 AADT
WIS 16	40-45 mph	4-Lane Divided	33,700 – 42,500
WIS 35 (Lang Dr, George St)	25 mph	4-Lane Divided, 4-lane Undivided, 5-lane, 3-Lane, 2-Lane	8,900 – 20,900
US 53 (Rose St, Copeland Ave)	30-40 mph	4-Lane Divided, 5-lane, One-Way Pair (2-lane)	23,100 – 33,200
WIS 16 (La Crosse St)	25 mph	2-Lane, 3-Lane	8,600 – 9,900
Losey Blvd	25 mph	4-Lane Divided, 4-lane Undivided, 5-lane	11,200 – 30,100
WIS 35 (West Ave)	25 mph	4-Lane Divided, 4-Lane Undivided	10,200 – 22,600
Downtown	25 mph	One-Way Pair (2-Lane, 3-Lane)	20,100 – 28,800
US 14/61 (South Ave, Mormon Coulee Rd)	30-35 mph	4-Lane Divided, 4-Lane Undivided	16,500 - 24,700

3. Programmed Improvements

The existing conditions report includes an analysis of project segments with existing conditions and recently completed and future improvements. A summary of recently completed projects and programmed improvements is in Figure 4: Recent Projects and Programmed Improvements.

Figure 4: Recent Projects and Programmed Improvements



4. Traffic Analysis

4.1 Traffic Volume Development

The original project scope included obtaining turning movement traffic counts (TMC) at 66 project intersections and Average Annual Daily Traffic (AADT) counts at 17 locations throughout project segments. At the outset of the project, a plan was developed to gather all project TMCs and AADT counts in the spring of 2020. Shortly after the project was initiated, the COVID-19 pandemic started, and a Stay-At-Home order was put in to place for Wisconsin and Minnesota. This had a significant impact on traffic volumes throughout the City and region, reducing traffic volumes by as much as 50% during peak hours. Due to COVID-19 traffic impacts, the original traffic data collection effort was postponed.

Per the WisDOT Bureau of Traffic Operations (BTO) COVID-19 Traffic Data Collection Interim Policy, traffic volumes were reevaluated in the summer of 2020 to determine if a traffic data collection effort could proceed. This evaluation concluded that traffic volumes had not stabilized and had not returned to pre-COVID levels. Given this, the decision was made to move forward with a much smaller traffic data collection effort in the fall of 2020 and supplementing with recent traffic data from a variety of sources.

With the inability to collect new traffic data at all project locations, a variety of sources were used to create a complete set of traffic data. These sources include:

1. The City of La Crosse initiated a traffic signal re-timing effort in 2019, an effort which included new turning movement traffic counts at 42 of the signalized intersections within project limits. The City provided these traffic counts for use in this study.
2. WisDOT-owned and maintained traffic signal installations within project limits are outfitted with Gridsmart traffic detection cameras. These cameras can be configured to collect turning movement traffic counts. Gridsmart TMCs at eight intersections were collected for use in this study.
3. New TMCs were gathered at the remaining 16 intersections. Adjustment factors were applied to these TMCs to account for COVID-related traffic impacts. Details of the adjustment factors are in Appendix 1: Traffic Count Adjustment Factors Memo.
4. The most recent WisDOT coverage counts will be utilized for AADT purposes. The majority of project segments had coverage counts completed in 2017.

Details of the traffic data collection effort are documented in Appendix 2: Traffic Data Collection Plan.

Peak hour turning movement traffic volumes used for the existing conditions analysis are in Appendix 3: Turning Movement Traffic Volumes.

4.2 Traffic Modeling

Traffic modeling was completed for all project intersections using Synchro and HCS traffic modeling software. To comply with WisDOT Traffic Engineering, Operations, and Safety Manual (TEOpS) guidance, Synchro was used for all signalized, two-way stop control, and all-way stop control intersections, while HCS was used for all roundabout intersections.

The method for evaluating controlled intersections is through assignment of a Level of Service (LOS) for each intersection movement and the intersection as a whole. The assigned LOS is a letter grade based on the amount of delay experienced by the average driver. The average delay thresholds used to assign LOS are different for signalized and unsignalized intersections. LOS thresholds are in Figure 5: Signalized LOS and Figure 6: Unsignalized LOS.

Figure 5: Signalized LOS

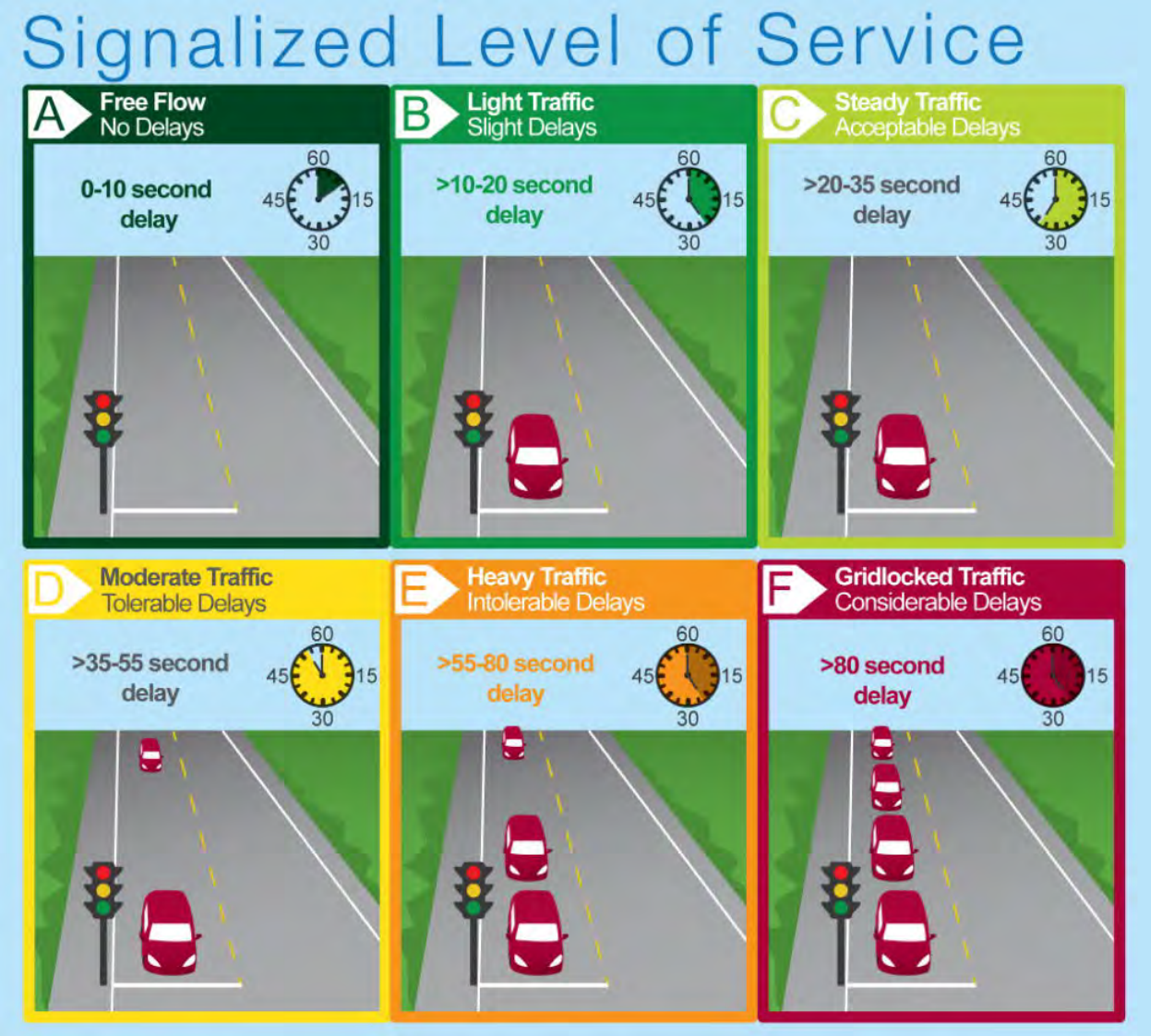
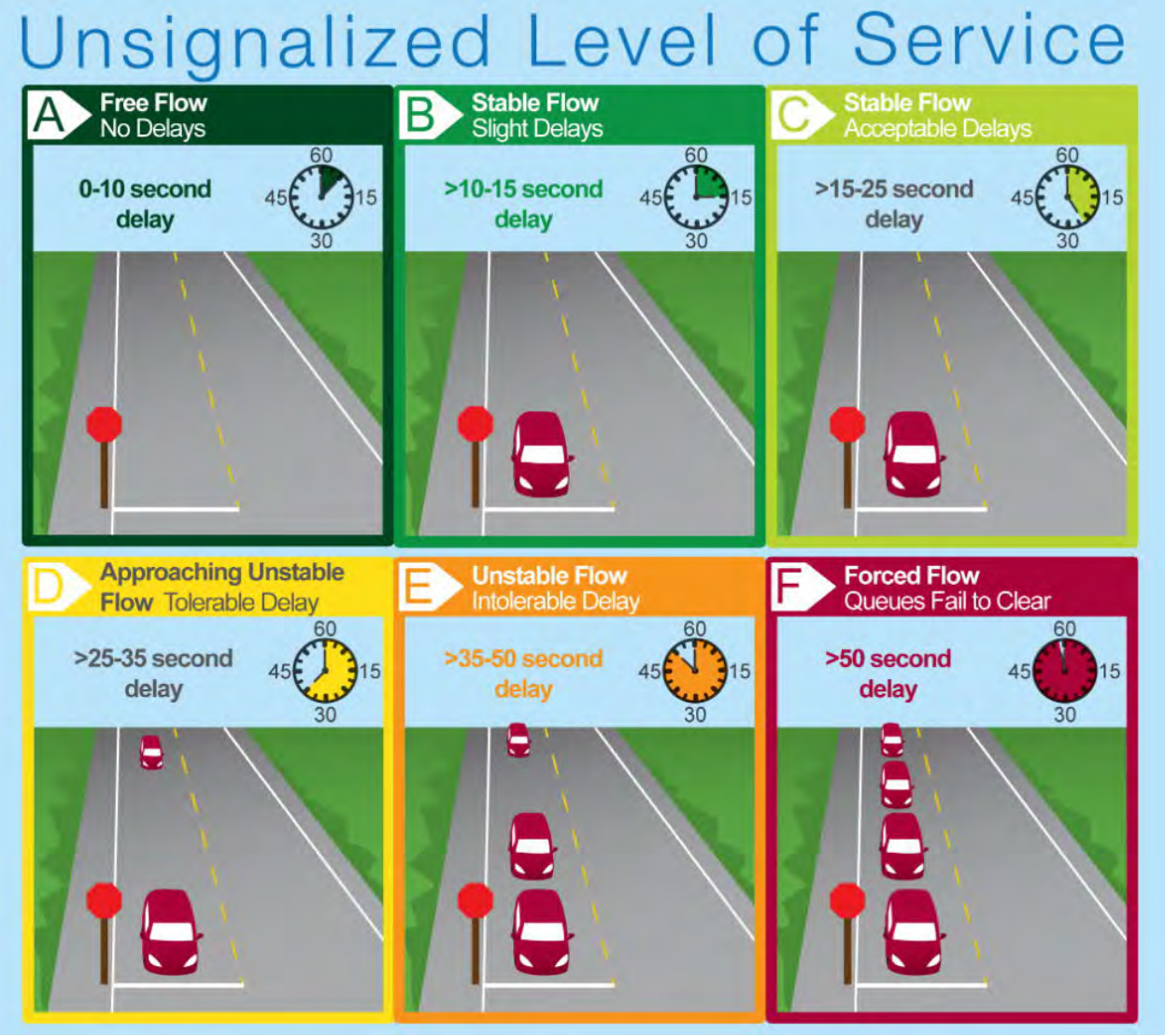


Figure 6: Unsignalized LOS



The WisDOT Facilities Development (FDM) 11-5-3.2.2 provides guidance on the selection of desirable and undesirable Level of Service (LOS). This guidance states "*Where practical, on C2030 and NHS routes, strive to provide LOS D or better operations for all movements at the intersection (left, through and right turning movements for each approach) during the peak hours of travel*." This FDM section also states *"Where it is not practical to achieve these levels of operation, a reduced LOS may be acceptable for minor street movements or major street non-through movements."*

With the exception of the segment of WIS 35 between US 14/61 and US 53, all project segments are Corridors 2030 or NHS routes. For consistency, the same determination of desirable and undesirable LOS will be applied to all segments.

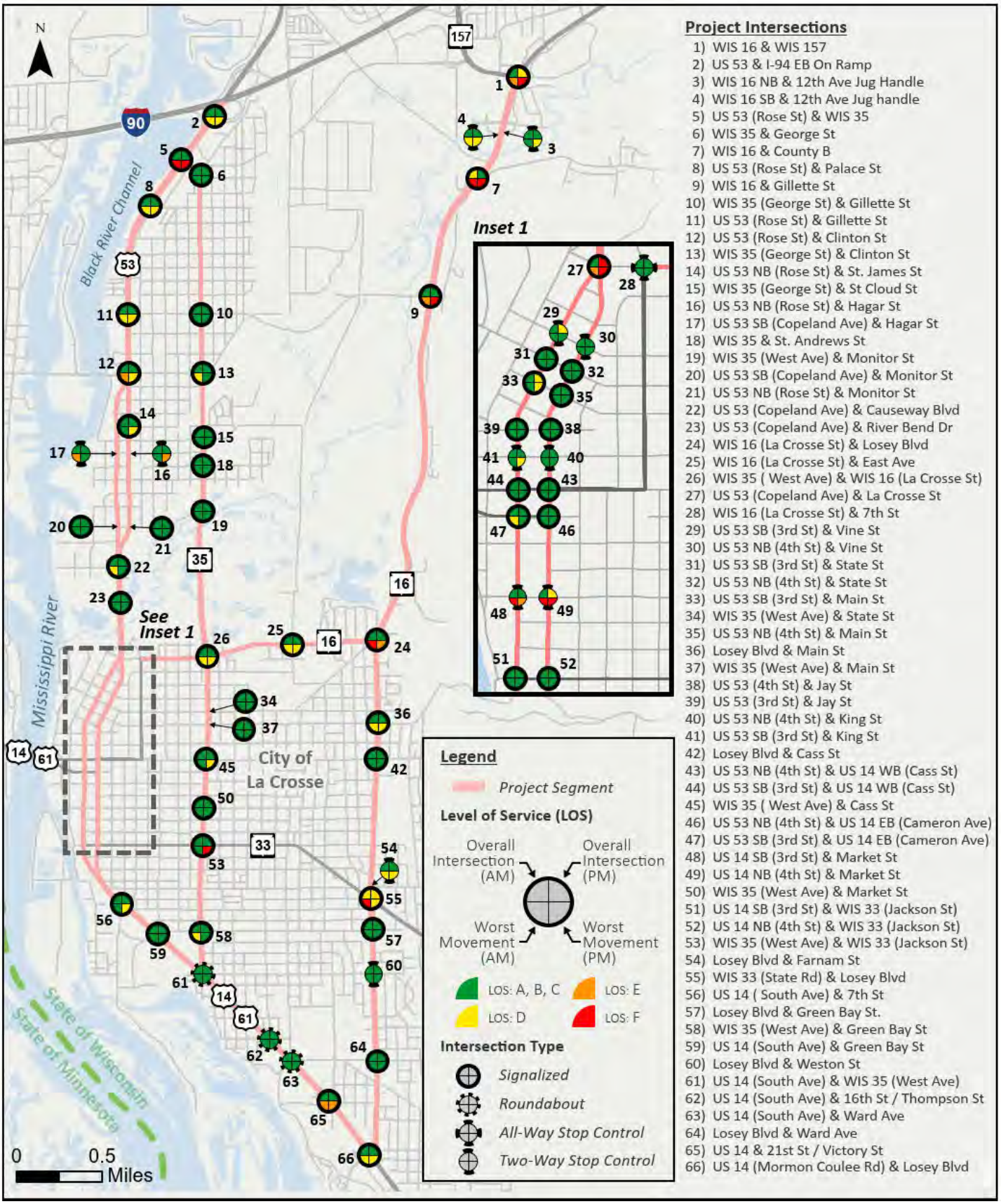
The FDM LOS guidance that non-mainline movements should be LOS D or better may not be practical for several project intersections. The project cost and property impacts to achieve the desired LOS will be excessive in some cases. In addition, for coordinated traffic signals with high cycle lengths, non-mainline movements may be LOS E or worse, even if the traffic volumes for that movement are low. To balance the FDM LOS guidance with site-specific practicality, the

following LOS evaluation methodology was developed for this study (departures from FDM LOS guidance in red):

- LOS A, B, C, and D are considered acceptable for individual movements and overall intersection operations.
- Overall intersection LOS E and F are considered to be deficient
- Individual movement LOS E for mainline through movements is considered to be deficient.
- Individual movement LOS E for non-mainline through movements will not be considered deficient but should be evaluated for improvement / mitigation.
- Individual movement LOS F is considered to be deficient.

Results of the traffic modeling effort are in Appendix 4: Existing Conditions Traffic Modeling Methodology and Results and a summary of LOS for project intersections is in Figure 7: Level of Service Results.

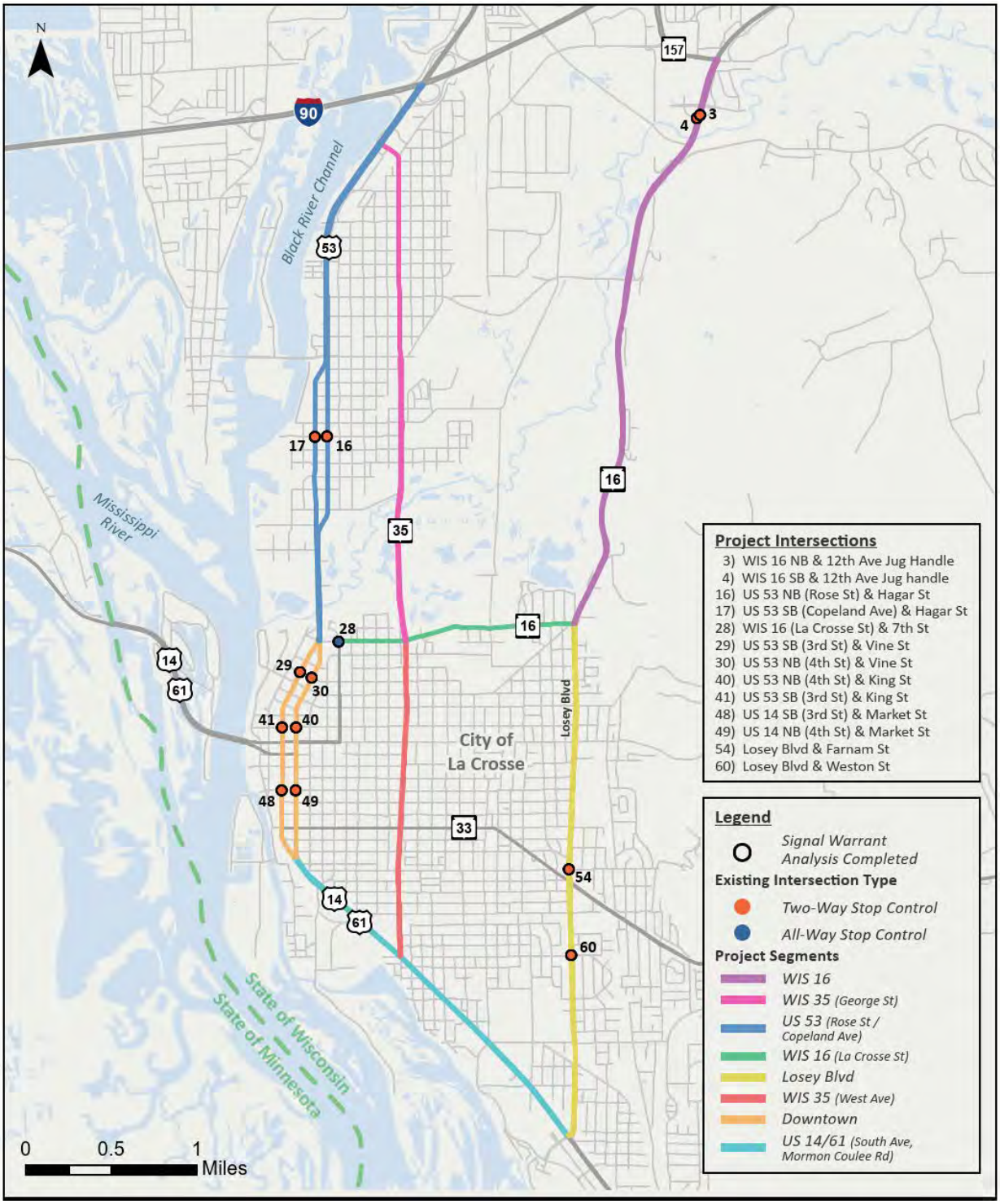
Figure 7: Level of Service Results



4.3 Traffic Signal Warrants

Project stop-controlled intersections were screened for traffic signal warrants to determine if traffic volumes were at a level that warranted signalization. The project intersections included in the signal warrant screening are in Figure 8: Signal Warrant Analysis Locations

Figure 8: Signal Warrant Analysis Locations



Traffic signal warrants are a series of volume thresholds, documented in the Manual on Uniform Traffic Control Devices (MUTCD), for which traffic signals have proven beneficial for the safety performance and/or operational performance of the intersection. In addition to vehicular volumes, factors considered in a warrant analysis include pedestrian volumes, presence of a school crossing, presence of a coordinated signal system, crash history, and proximity to a railroad grade crossing.

Based on traffic volumes obtained in the fall of 2020, a signal warrant screening was completed using warrants 1 (8-hour volume) and 2 (4-hour volume). Traffic volumes were insufficient to meet warrants 1 and 2 at any of these intersections. Signal warrants 4 (pedestrian volume) and 7 (crash experience) were also considered, but a quick review of pedestrian volumes and crash frequency indicated these warrants would not be met.

Caution should be used in drawing conclusions from these warrant analysis results since the TMCs at all stop-controlled intersections were gathered in the fall of 2020 when there were traffic reductions due to the COVID-19 pandemic. To determine whether or not any of these intersections might potentially meet signal warrants once the COVD-19 pandemic has ended, a sensitivity analysis was completed to determine if any signal warrants would be met if traffic volumes were 50% higher than the volumes gathered in the fall of 2020. The 50% figure is a conservative estimate of COVID-related traffic impacts.

A list of intersections that might meet signal warrants under these conditions, including the percentage volume increase needed to meet warrants, is below:

1. Intersection 28: WI 16 (La Crosse St) & 7th St (32% volume increase)
2. Intersection 49: US 14/61 NB (4th Street) & Market Street (38% volume increase)
3. Intersection 60: Losey Blvd & Weston St (49% volume increase)

If the improvement alternatives considered at these intersections include signalization, post-COVID traffic volumes should be gathered and traffic signal warrants reevaluated.

Traffic signal warrant analysis results are in Appendix 5: Traffic Signal Warrant Analysis.

With the exception of the WI 16 (La Crosse St) & 7th St intersection (which already has all-way stop control), all stop-controlled intersections have a clear major street and minor street. All-way stop control is not desirable at these intersections, so all-way stop control warrants were not evaluated.

4.4 Origin-Destination Study

An origin-destination (O-D) study will be completed for this study using data collected from Streetlight (Streetlightdata.com). Streetlight is a web-based application that derives O-D information from cell phone location-based services and GPS devices.

The O-D study will provide the most value in determining changes to regional traffic patterns as a result of potential improvement alternatives, an effort that will be documented in later stages of this study. The existing conditions O-D study methodology used and key statistics from an analysis of current and recent travel patterns are documented in

Appendix 6: Existing Conditions O-D Study. Key findings from the existing conditions O-D study include:

- Nearly half of trips have an origin and a destination within the City. Only 7% of trips have an origin and destination outside the City.
- There is a strong commuter trend of trips originating north of the City destined for employment centers in the AM peak, then returning to their origins in the PM peak.
- US 53, WIS 35, and WIS 16 are the only routes that cross the La Crosse River and surrounding wetlands. Of these routes, WIS 16 is the most heavily used, followed by US 53 and WIS 35.

4.5 Traffic Analysis Summary

The following is a summary of traffic issues identified for each project segment:

WIS 16 Segment

- LOS deficiencies exist at intersections 7 (WIS 16 & County B) and 9 (WIS 16 & Gillette St). This is primarily due to high mainline volumes on WIS 16.
- The deficient PM LOS at intersection 1 (WIS 16 & WIS 157) is only for the low-volume Southbound WIS 16 left turn movement to Mall Drive.

US 53 (Rose St, Copeland Ave) Segment

- The deficient AM LOS at intersection 5 (US 53 & WI 35) is only for the low-volume entrance to the parking lot on the west approach. The deficient PM LOS for this intersection is for the southbound left turn movement and is due to the combination of high southbound left turn volumes and high northbound through volumes.

WIS 16 (La Crosse St) Segment

- The deficient LOS at intersection 24 (WI 16 (La Crosse St) & Losey Blvd) is only for the low-volume east approach.

Losey Blvd Segment

- The deficient LOS at intersection 55 (Losey Blvd & WI 33 (State Rd)) is for the eastbound right turn movement and is primarily due to high westbound right turn volumes and a lack of a westbound right turn lane.

WIS 35 (West Ave) Segment

- The deficient LOS at intersection 53 (WIS 35 (West Ave) & WIS 33 (Jackson St)) is for the eastbound left turn movement. This is primarily due to high eastbound left turn and westbound through volumes, and a lack of protected left turn phasing for the eastbound left turn movement.. It should be noted the analysis was completed based on the future project geometry in the let plans for project 5120-03-72 (scheduled for a May, 2021 bid letting).

Downtown Segment

- The deficient LOS at intersection 27 (USH 53 (3rd Street) & La Crosse St) is for several movements in the PM peak period. This is primarily due to high volumes for these movements and overall intersection capacity.
- The deficient LOS at intersections 48 (US 14/61 (3rd St) & Market St) and 49 (US 14/61 (4th St) & Market St) are for the side road approaches and are primarily due to a lack of gaps

5. Historical Crash Analysis

A historical crash analysis was completed for all project segments and intersections. This analysis is being completed on multiple project segments and intersections and will be formatted to follow the steps of WisDOT's Safety Certification Process (SCP). The SCP is the process by which WisDOT is implementing safety into the performance based practical design (PBPD) philosophy of "right fix, right time, right location." The outcome of this process is the optimization of fund allocation to maximize measurable safety improvement. Per the WisDOT Facilities Development Manual (FDM) 11-38-10.1, the steps of the SCP include:

1. **Sites of Promise by System Screening (System Screening)**: Safety screening to identify highway segments and intersections with potential for crash reduction.
2. **Crash Vetting for the Site of Promise (Crash Vetting)**: Investigation of the Sites of Promise to understand crash trends and patterns, identify the contributing factors to crashes at those sites, and vet crashes where there is no engineering solution.
3. **Contributing Geometric Analysis (CGA)**: Analyze how geometric features contributed to the crash history and identify possible countermeasures.
4. **Safety Mitigation Certification Process (SMCP)**: This two-part process includes Performance Based Safety Engineering Analysis and Economic Appraisal. This involves predictive crash modeling and application of economic appraisals to determine benefit-cost. Overall, these two processes allow direct monetary comparison of mitigation alternatives.
5. **Safety Certification Document (SCD)**: The final document that describes the process, engineering judgment, and support for safety improvements for a project.

The La Crosse Safety & Operations Study will include completion of SCP steps 1-4. This existing conditions report includes the results of SCP steps 1 (system screening) and 2 (crash vetting), while steps 3 and 4 will be completed in later reports. Since this study is a preliminary planning study, the SCD (step 5) will not be completed for each site of promise. The documentation of SCP steps 1-4 can be used for creation of the SCD, when needed.

The following is a summary of the historical crash analysis. Full documentation of the crash analysis methodology and results is in Appendix 7: Historical Crash Analysis Methodology.

5.1 System Screening

A system screening for 2014-2018 crash data was completed for all project segments and intersections to determine which intersections and segments are flagged as sites of promise. A site of promise is defined in the FDM as a location that has a potential for crash reduction with targeted improvements. The following two WisDOT tools were used for identifying these sites of promise:

- Safety Certification Mapping (SCM) Tool in WisTransportal (highway segments)
- WisDOT SW Region's Intersection Network Screening Spreadsheet

A summary of crash severity and key crash statistics is summarized in Figure 9: Crash Severity, Figure 10: Crash Location, and Figure 11: Crash Type. A summary of project segments and intersections flagged as sites of promise are in Figure 12: Sites of Promise (2014-2018).

Figure 9: Crash Severity

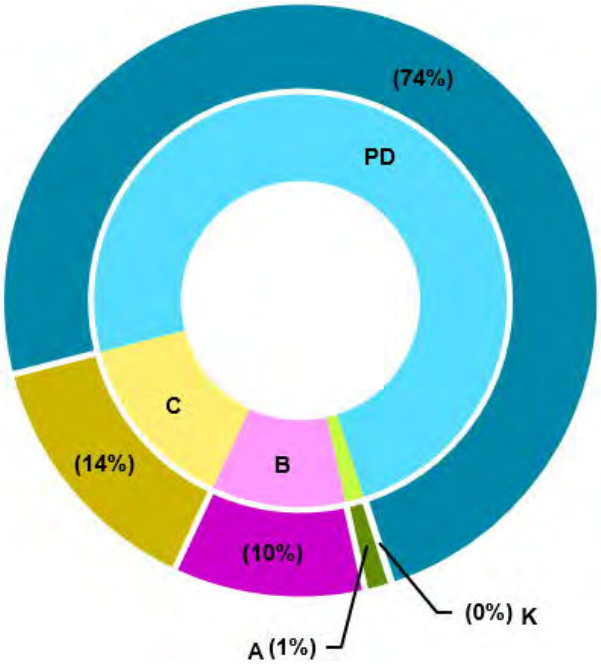


Figure 10: Crash Location

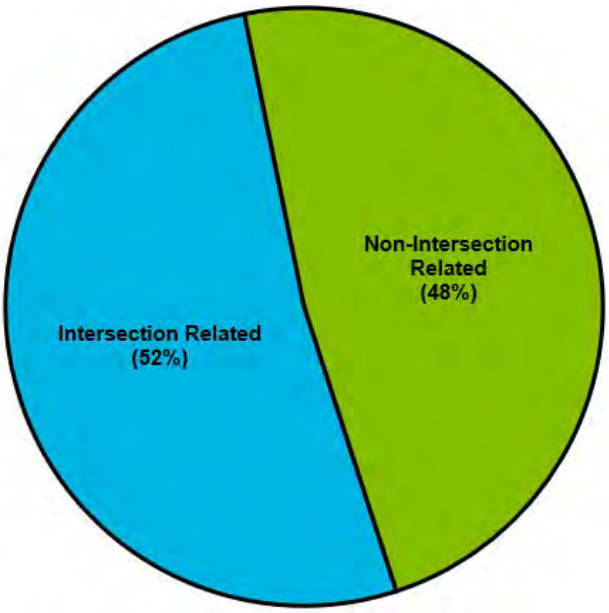


Figure 11: Crash Type

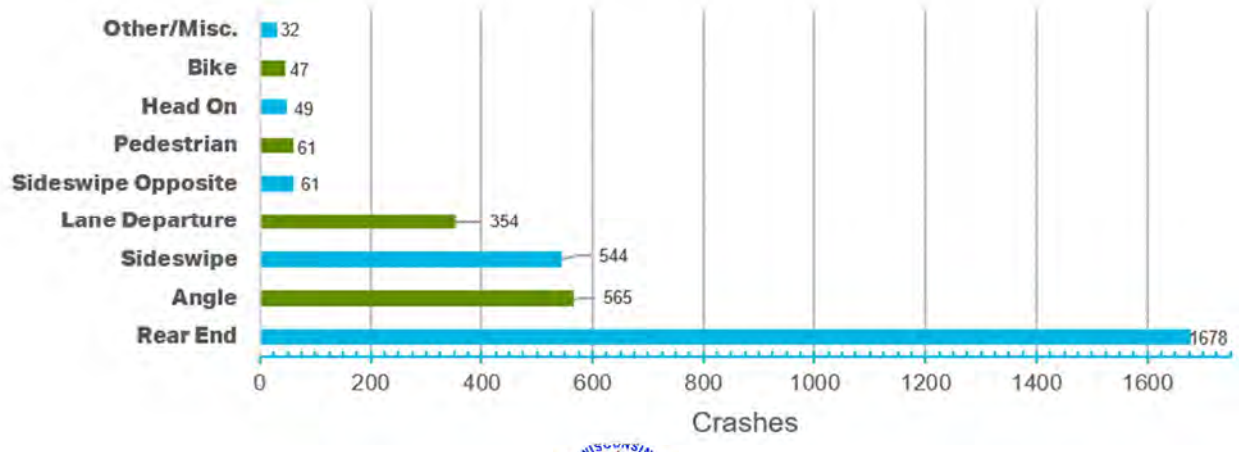
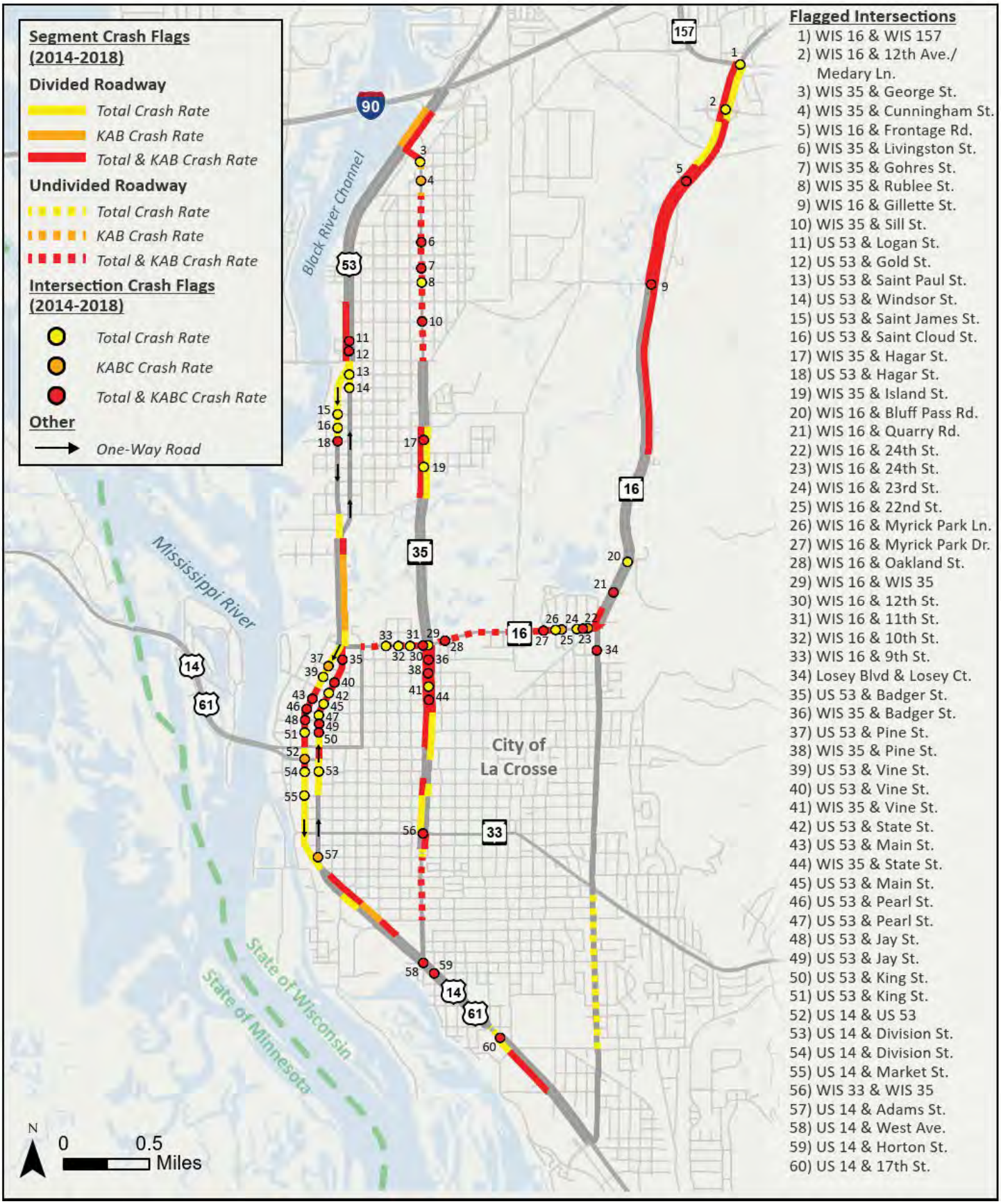


Figure 12: Sites of Promise (2014-2018)



In total, 117 highway segments totaling 16.8 miles and 58 intersections were flagged as sites or promise.

5.2 Bicycle & Pedestrian Crashes

The majority of roadway miles within project segments are urban or transitional and bicycle/pedestrian safety is of utmost importance to the City of La Crosse. Bicycle and pedestrian crashes were evaluated separately. A summary of crash type and crash severity are in Figure 13: Bicycle & Pedestrian Crash Type and Figure 14: Bicycle & Pedestrian Crash Severity. Crash location summaries are in Figure 15: Bicycle Crashes (2014-2018) and Figure 16: Pedestrian Crashes (2014-2018).

Figure 13: Bicycle & Pedestrian Crash Type

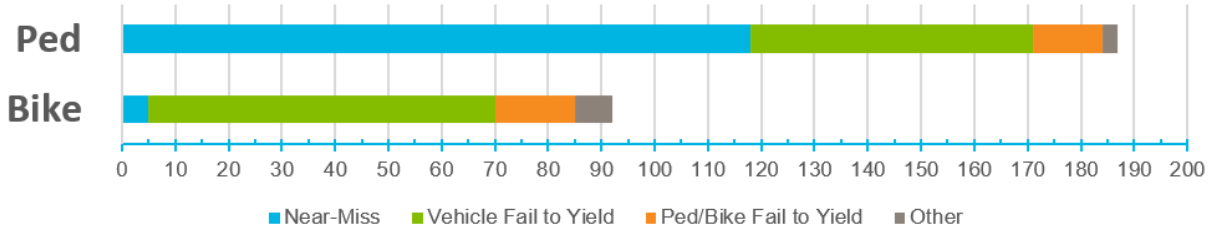


Figure 14: Bicycle & Pedestrian Crash Severity

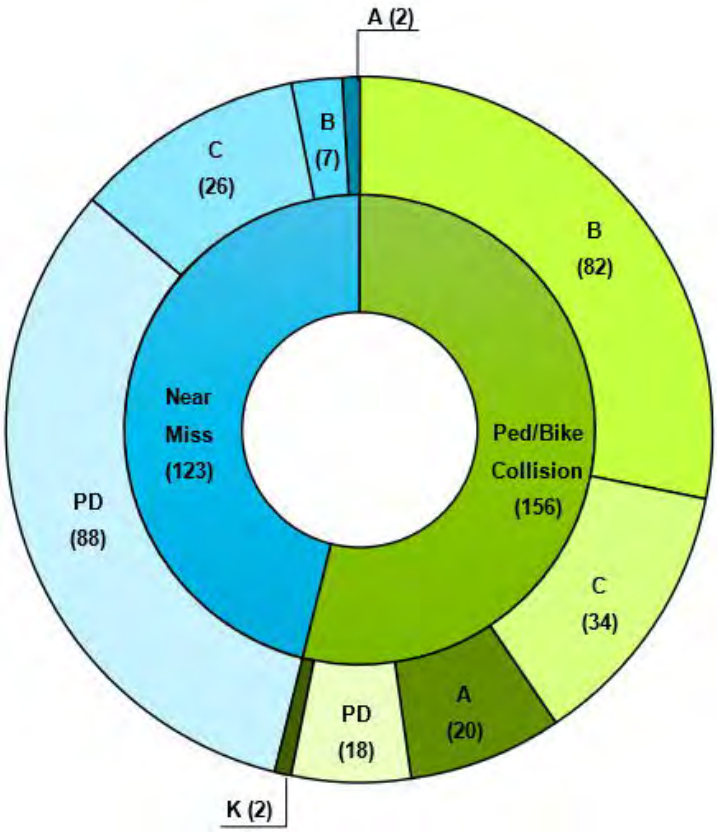


Figure 15: Bicycle Crashes (2014-2018)

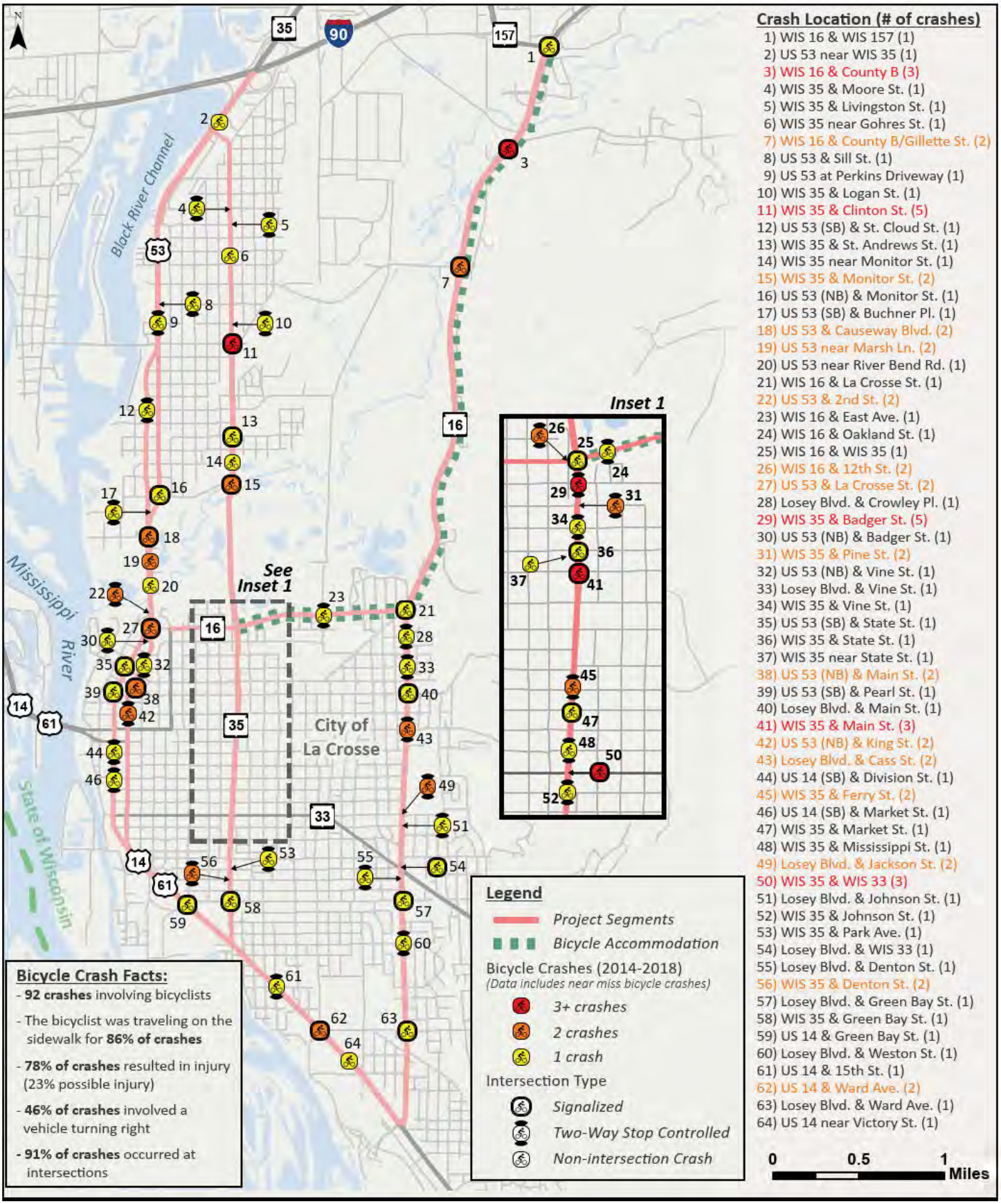
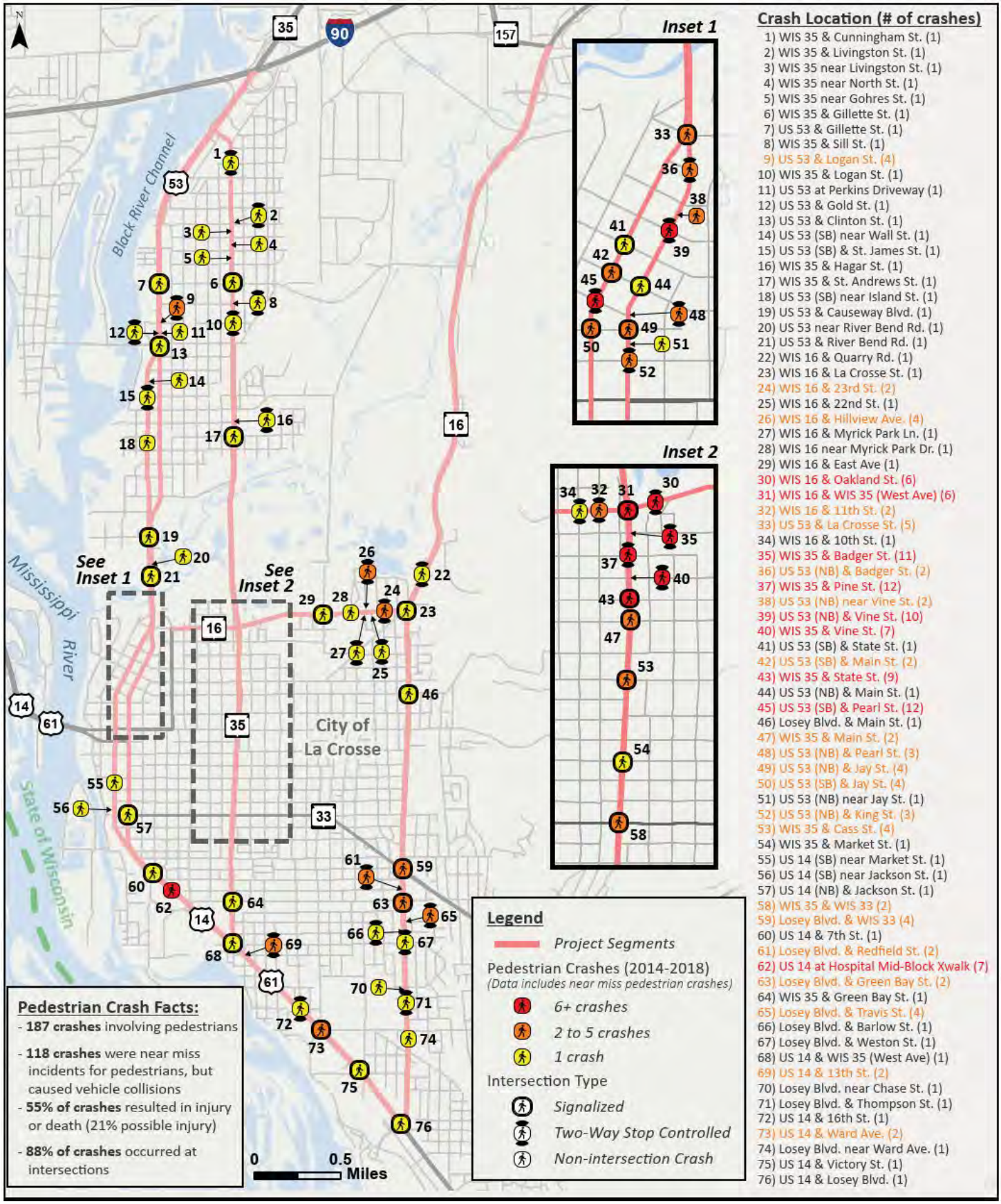


Figure 16: Pedestrian Crashes (2014-2018)



5.3 Crash Vetting

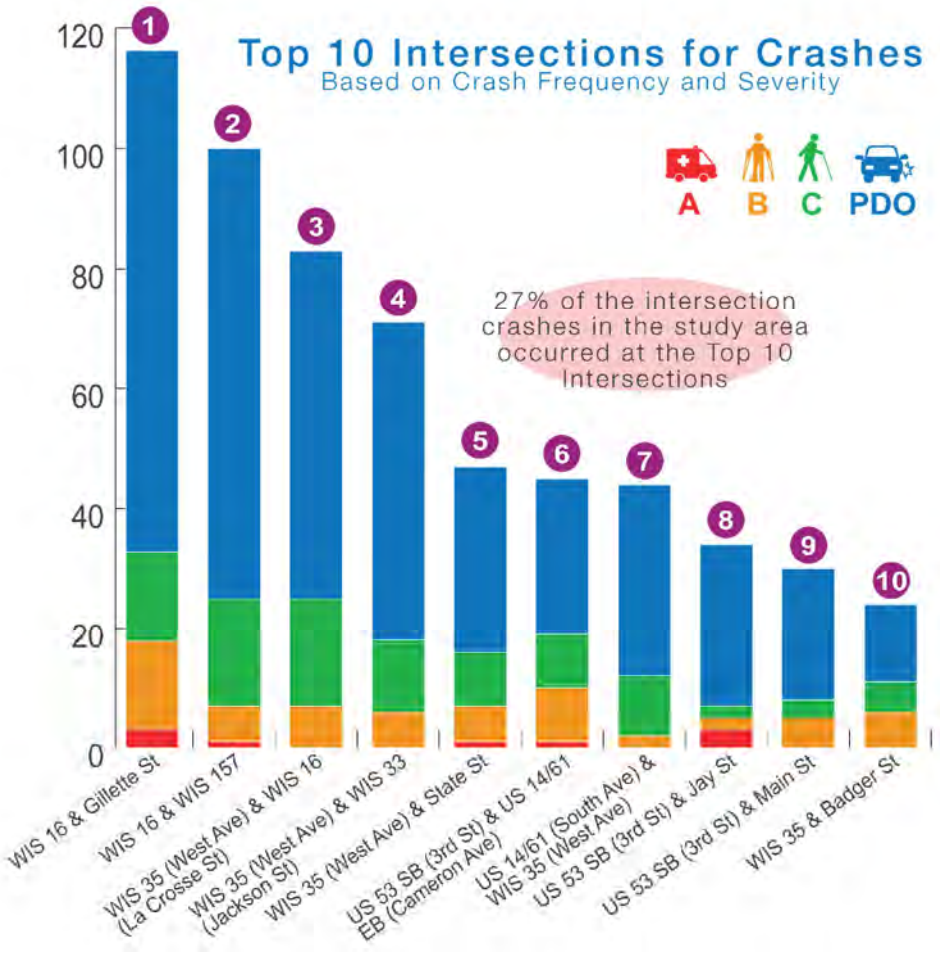
Intersections and segments identified as sites of promise are carried forward in the Safety Certification Process with crash vetting. This comprehensive crash data verification process includes reviewing all flagged crashes for sites of promise to confirm their relevance to the project and determine if further analysis is needed to identify safety concerns and potential solutions.

The crash vetting process resulted in the "vetting out" of 14% of the crashes originally identified as having occurred at one of the sites of promise. The two main types of crashes that were vetted out were those that were incorrectly coded to a project roadway and those related to human error (driver falling asleep, road rage, excessive speeding, etc). Details of the crash vetting, including a segment-by-segment statistical breakdown of crash type and severity, are in Appendix 7: Historical Crash Analysis Methodology.

5.4 Intersection Crashes

The crash vetting effort indicates the majority of crashes within flagged segments occurred at intersections. To assist in the identification of crash trends, post-vetting crash diagrams were created for the top 10 flagged intersections, ranked by crash frequency and crash severity. A summary of the crash frequency of the top 10 intersections is in Figure 17: Crash Frequency - Top 10 Intersections. Crash diagrams are in Appendix 8: Intersection Crash Diagrams.

Figure 17: Crash Frequency - Top 10 Intersections



5.5 Historical Crash Analysis Summary

The following is a summary of crash issues identified for each project segment:

WIS 16 Segment

- 58% of segments flagged as sites of promise
- 7 Intersections flagged as sites of promise, including two of the “Top 10” intersections
- 1 intersection had more than two bicycle crashes
- 71% of crashes, 72% of injury crashes, and 100% of bicycle/ped crashes occurred at intersections

WIS 35 (Lang Dr, George St) Segment

- 61% of segments flagged as sites of promise
- 8 Intersections flagged as sites of promise
- 1 intersection had more than two bicycle crashes
- 62% of crashes, 66% of injury crashes, and 84% of bicycle/ped crashes occurred at intersections

US 53 (Rose St, Copeland Ave) Segment

- 38% of segments flagged as sites of promise
- 7 Intersections flagged as sites of promise
- 75% of crashes, 84% of injury crashes, and 80% of bicycle/ped crashes occurred at intersections

WIS 16 (La Crosse St) Segment

- 97% of segments flagged as sites of promise
- 12 Intersections flagged as sites of promise, including one of the “Top 10” intersections
- 1 intersection had five pedestrian crashes
- 78% of crashes, 84% of injury crashes, and 100% of bicycle/ped crashes occurred at intersections

Losey Blvd Segment

- 31% of segments flagged as sites of promise
- 1 Intersections flagged as a site of promise.
- 1 intersection had more than two pedestrian crashes
- 82% of crashes, 90% of injury crashes, and 95% of bicycle/ped crashes occurred at intersections

WIS 35 (West Ave) Segment

- 74% of segments flagged as sites of promise
- 5 Intersections flagged as sites of promise, including three of the “Top 10” intersections
- 3 intersections had more than two bicycle crashes
- 90% of crashes, 89% of injury crashes, and 94% of bicycle/ped crashes occurred at intersections

Downtown Segment

- 84% of segments flagged as sites of promise
- 18 Intersections flagged as sites of promise, including three of the “Top 10” intersections
- 3 intersections had more than two pedestrian crashes
- 74% of crashes, 84% of injury crashes, and 97% of bicycle/ped crashes occurred at intersections

US 14/61 (South Ave, Mormon Coulee Rd) Segment

- 31% of segments flagged as sites of promise
- 3 Intersections flagged as sites of promise, including one of the “Top 10” intersections
- 74% of crashes, 72% of injury crashes, and 78% of bicycle/ped crashes occurred at intersections

6. Structure Condition

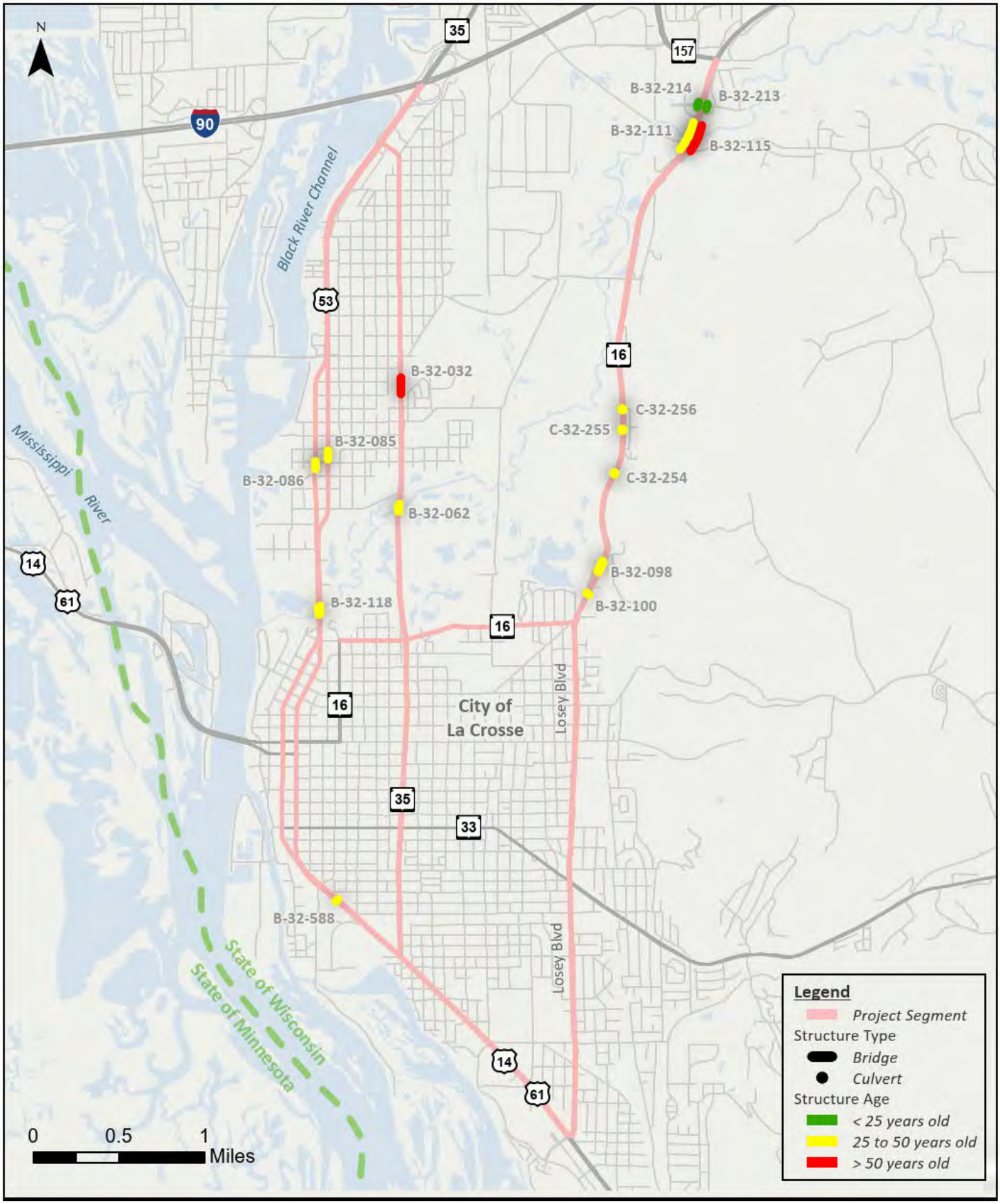
Eleven bridges, one multi-cell box culvert with a total span length exceeding 20', and three other box culverts are located within the study area. Multi-cell box culverts spanning more than 20' are classified as bridges. A discussion of the attributes for structures located within project segments is below, and the full summary of structure attributes is in Appendix 9: Existing Structures Data. Existing structure data was collected from the WisDOT Highway Structures Information System (HSIS).

6.1 Structure Age

Although the age of a structure is not a direct indicator of a structure's needs, it is a gauge to assess the magnitude of potential future structures maintenance projects required within a corridor. The average age of all structures on the corridor is 37 years. Until recently, the theoretical design life of a bridge was 50 years[1]. As of 2020, there are two bridges that are more than 50 years old. This includes the WIS 35 (George St) bridge over the Chicago, Milwaukee, St Paul, and Pacific railroad (CMSTPP) (B-32-32), and the WIS 16 eastbound bridge over the Canadian Pacific railroad (CP) and the La Crosse River (B-32-115). The ages of all structures within project segments are in Figure 18: Structure Age

1. FHWA Bridge Preservation Guide (2011) https://portal.ct.gov/-/media/DOT/documents/dbridgepubs/PreservationGuidepdf.pdf

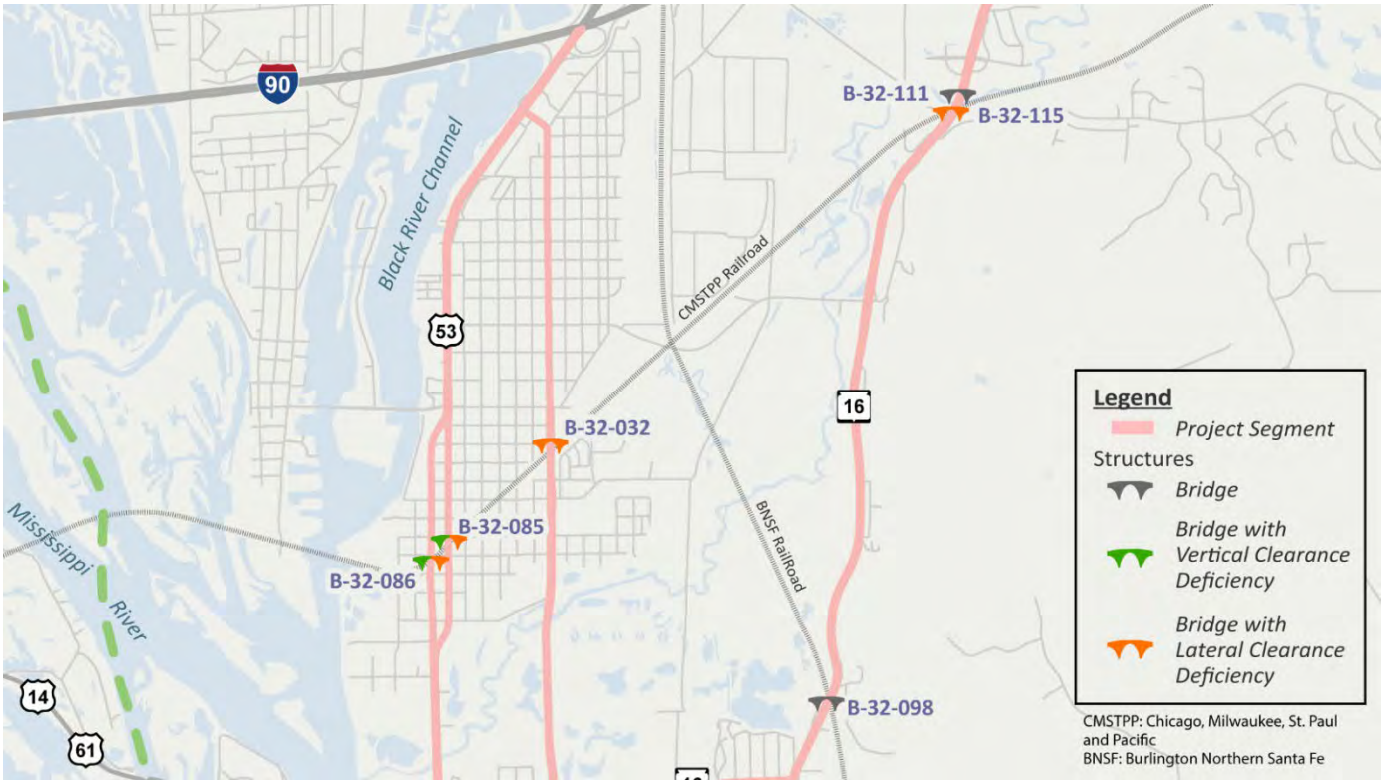
Figure 18: Structure Age



6.2 Railroad Crossing Structures

There are two major railroads running through the City of La Crosse that intersect project roadways, the Chicago, Milwaukee, St. Paul and Pacific (CMSTPP) and the Burlington Northern Santa Fe (BNSF). In total, six bridges span existing rail facilities, which is over 50% of the bridges included in the corridor study. A graphic showing the structures crossing railroads within the corridor is in Figure 19: Railroad Crossing Structures. This figure identifies structures with existing lateral and/or vertical clearance deficiencies – additional information on these deficiencies is in subsequent sections of this report.

Figure 19: Railroad Crossing Structures



6.3 Vertical and Lateral Clearance

Each of the structures along the corridor were evaluated for vertical and lateral clearance.

6.3.1 Vertical Clearance

Vertical clearance was evaluated for all grade separation structures along the corridor. The two bridges spanning only the La Crosse River (B-32-118 and B-32-062) are not included in this evaluation. There is only one bridge over the project roadway segments, the Gunderson Clinic Skywalk (B-32-588) over US 14/61 (South Ave) and it has adequate clearance. All other grade separation bridges in the corridor carry mainline traffic and two of those structures have insufficient clearance over the roadway/railroad.

FDM 11-35, Attachment 1.9 was used to determine the minimum required vertical clearance for each structure. This is the minimum clearance used when evaluating existing structures not being replaced. Additionally, the pedestrian underpass within the project limits, B-32-100, was compared to the minimum design height for a pedestrian underpass of 8'-0" per Wisconsin Bridge Manual (WBM) 36.2. The actual and minimum required clearances for each grade separation structure are in Table 3: Bridge Vertical Clearance. Measured clearances that are less than the minimum required are highlighted in red.

Table 3: Bridge Vertical Clearance

Bridge Number	Facility On	Facility Under	Measured Clearance over Roadway / Railroad (ft)	Min. Roadway / Railroad Clearance (ft)
B-32-32	WIS 35 (George Street)	CMSTPP Railroad	23' – 4"	23'-0"
B-32-85	US 53 NB (Rose Street)	CMSTPP Railroad / Andrew St	11' – 10" (Roadway) 22' – 11 ¼" (Railroad)	14' – 9" (Roadway) 23'-0" (Railroad)
B-32-86	US 53 SB (Copeland Avenue)	CMSTPP Railroad / Island St	16' – 4" (Roadway) 22' – 3" (Railroad)	14' – 9" (Roadway) 23'-0" (Railroad)
B-32-98	WIS 16	BNSF Railroad	23' – 5"	23'-0"
B-32-100	WIS 16	Miller Coulee Pedestrian Trail	8' - 0"	8' – 0"
B-32-111	WIS 16 WB	La Crosse River/CMSTPP Railroad	29' – 8"	23'-0"
B-32-115	WIS 16 EB	La Crosse River/CMSTPP Railroad	26' – 6"	23'-0"
B-32-213	WIS 16 EB	12th Ave	17' - 6"	14' – 9"
B-32-214	WIS 16 WB	12th Ave	17' - 2"	14' – 9"
B-32-588	Gunderson Clinic Skywalk	US 14/61 (South Ave)	19' – 8"	17' – 4"

6.3.2 Lateral Clearance

With a total of 12 bridges in the corridor, 10 were evaluated for lateral clearance. The other two bridges span only waterways.

Grade Separations over Railroad

Of the six grade separation structures over railroads, four were flagged for deficient lateral clearance and are listed in Table 4: Lateral Clearance - Bridges over Railroads. Clearance was considered deficient if it was less than 18'-0", which requires special coordination with the state railroad and track engineer. All four bridges listed had lateral clearances less than 18'-0" to a pier substructure.

Table 4: Lateral Clearance - Bridges over Railroads

Bridge Numbers	Facility On	Facility Under	Adjacent Roadway	Actual Minimum Lateral Clearance
B-32-32	WIS 35 (George St)	CMSTPP RR	South of Clinton St	10.3’
B-32-85	US 53 NB (Rose St)	CMSTPP RR	Andrew St	10’
B-32-86	US 53 SB (Copeland Ave)	CMSTPP RR	Island St	15.5’
B-32-115	WIS 16 EB	CMSTPP RR	South of 12th Ave S	8.5’

Grade Separations over Roadways

Two bridges in this corridor are grade separation structures over roadways and have adequate lateral clearance. These WIS 16 twin bridges (B-32-213/214) are over 12th Avenue, which has an urban typical section. The remaining bridge is the pedestrian overpass for the Gunderson clinic. This bridge, B-32-588, spans from building to building and does not have any additional substructure units and was therefore not included in the lateral clearance analysis.

Pedestrian Underpass

There is one pedestrian underpass (B-32-100) on this corridor for the Miller Coulee Pedestrian Trail which does not meet current design standards. The width of the existing box opening (8’-6”) is less than the minimum width of 10’ required for the design of new pedestrian underpasses per WBM 36.2.

6.4 National Bridge Inventory (NBI) Ratings

The National Bridge Inventory (NBI) Ratings include three primary ratings for bridges and one primary rating for culverts. The bridge components are rated on a scale of 0 – 10 with 10 being a new bridge and 0 being a closed structure. A summary of the scale is in Table 5: National Bridge Inventory Rating Scale. The NBI primary component ratings for each structure are in Table 6: National Bridge Inventory Ratings

Table 5: National Bridge Inventory Rating Scale

National Bridge Inventory Rating	Condition
>5	Satisfactory to Excellent Condition
5	Fair Condition
< 5	Poor to Failed Condition

Table 6: National Bridge Inventory Ratings

Bridge Number	Facility On	Facility Under	NBI Deck	NBI Superstructure	NBI Substructure	NBI Culvert
B-32-32	WIS 35 (George St)	CMSTPP Railroad	6	7	7	---
B-32-62	WIS 35 (Lang Dr)	La Crosse River	7	8	7	---
B-32-85	US 53 NB (Rose St)	CMSTPP Railroad/Andrew St	6	7	6	---
B-32-86	US 53 SB (Copeland Ave)	CMSTPP Railroad/Island St	6	8	8	---
B-32-98	WIS 16	BNSF Railroad	5	7	7	---
B-32-100	WIS 16	Miller Coulee Pedestrian Trail	---	---	---	6
B-32-111	WIS 16 WB	La Crosse River/CMSTPP Railroad	5	7	7	---
B-32-115	WIS 16 EB	La Crosse River/CMSTPP Railroad	6	5	6	---
B-32-118	US 53 (Copeland Ave)	La Crosse River	6	8	7	---
B-32-213	WIS 16 EB	12th Ave	7	7	7	---
B-32-214	WIS 16 WB	12th Ave	7	8	7	---
B-32-588	Gunderson Clinic Skywalk	US 14/US 61	---	---	---	---
C-32-254	WIS 16	Drainage Way	---	---	---	6
C-32-255	WIS 16	Drainage Way	---	---	---	7
C-32-256	WIS 16	Drainage Way	---	---	---	6

There are no bridges on this corridor that are classified as structurally deficient. A structure is considered structurally deficient when one of the NBI primary components has a rating of 4 or less, which is considered poor condition.

6.5 Load Postings

All structures within the corridor were reviewed in the HSIS database, and as of 2020, none of the bridges in this corridor are load posted.

6.6 Structure Condition Summary

The following is a summary of structure condition issues identified for each project segment:

WIS 16 Segment

- Bridge B-32-115 is more than 50 years old
- Bridge B-32-115 has a lateral clearance deficiency

WIS 35 (Lang Dr, George St) Segment

- Bridge B-32-032 is more than 50 years old
- Bridge B-32-032 has a lateral clearance deficiency

US 53 (Rose St, Copeland Ave) Segment

- Bridges B-32-085 and B-32-086 have vertical clearance deficiencies
- Bridges B-32-085 and B-32-086 have lateral clearance deficiencies

7. Pavement Condition

Existing pavement attributes for all state and US highway roadway segments was included in the WisDOT Meta-Manager Management System Database, dated February 2020, received from the WisDOT Division of Transportation Investment Management Bureau of State Highway Programs (Program Development and Analysis Section). Existing pavement attributes for Losey Boulevard was obtained through the Wisconsin Information System for Locals Roads (WISLR).

7.1 Pavement Type

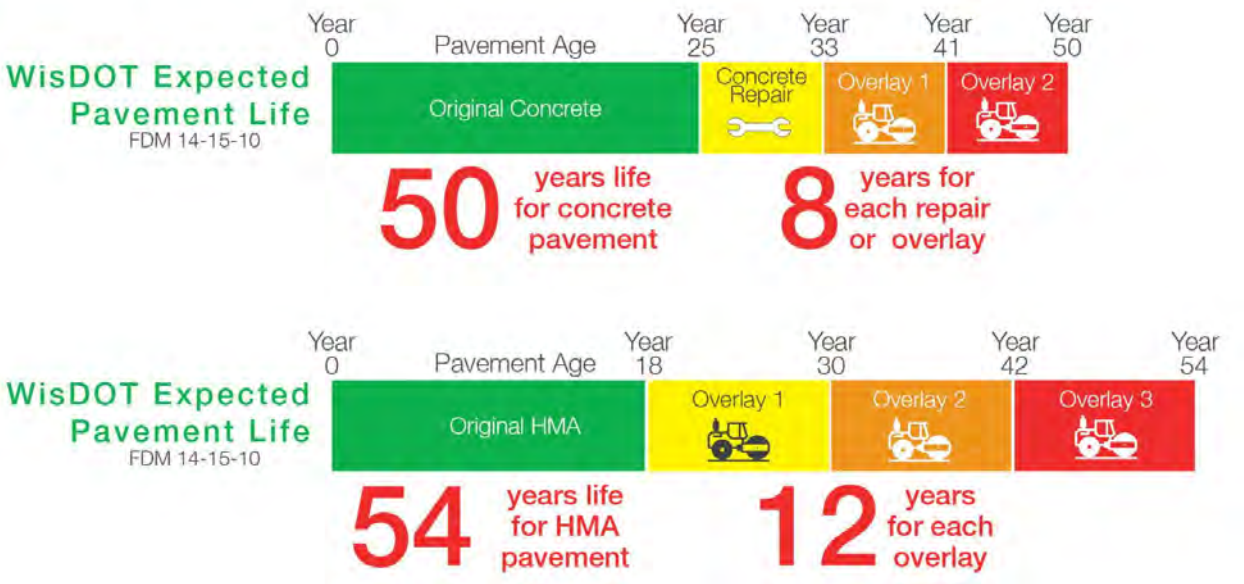
A wide range of pavement types exist within the various project segments. A graphical summary of pavement type is in Figure 20: Pavement Type.

Figure 20: Pavement Type

7.2 Pavement Age

Pavement age plays a critical factor in the pavement condition of each segment. FDM 14-15-10 provides guidance on typical maintenance treatments and the expected service life in a pavement life cycle. Hot Mix Asphalt (HMA) and concrete pavements have unique pavement life cycles, which are detailed in Figure 21: Pavement Life Cycle.

Figure 21: Pavement Life Cycle



A graphical summary of the age of the pavement surface is in Figure 22: Pavement Surface Age. It should be noted surface age is not necessarily an indication of remaining pavement life since it doesn't include the age of the full pavement structure or the pavement's stage in the pavement life cycle. For example, a concrete pavement with a 10-year surface age may have more than 40 years of remaining pavement life if the full pavement structure is also 10 years old, while an HMA pavement with a 5-year surface age may need full replacement in 7 years if it's most recent treatment was the third and last overlay.

Figure 22: Pavement Surface Age

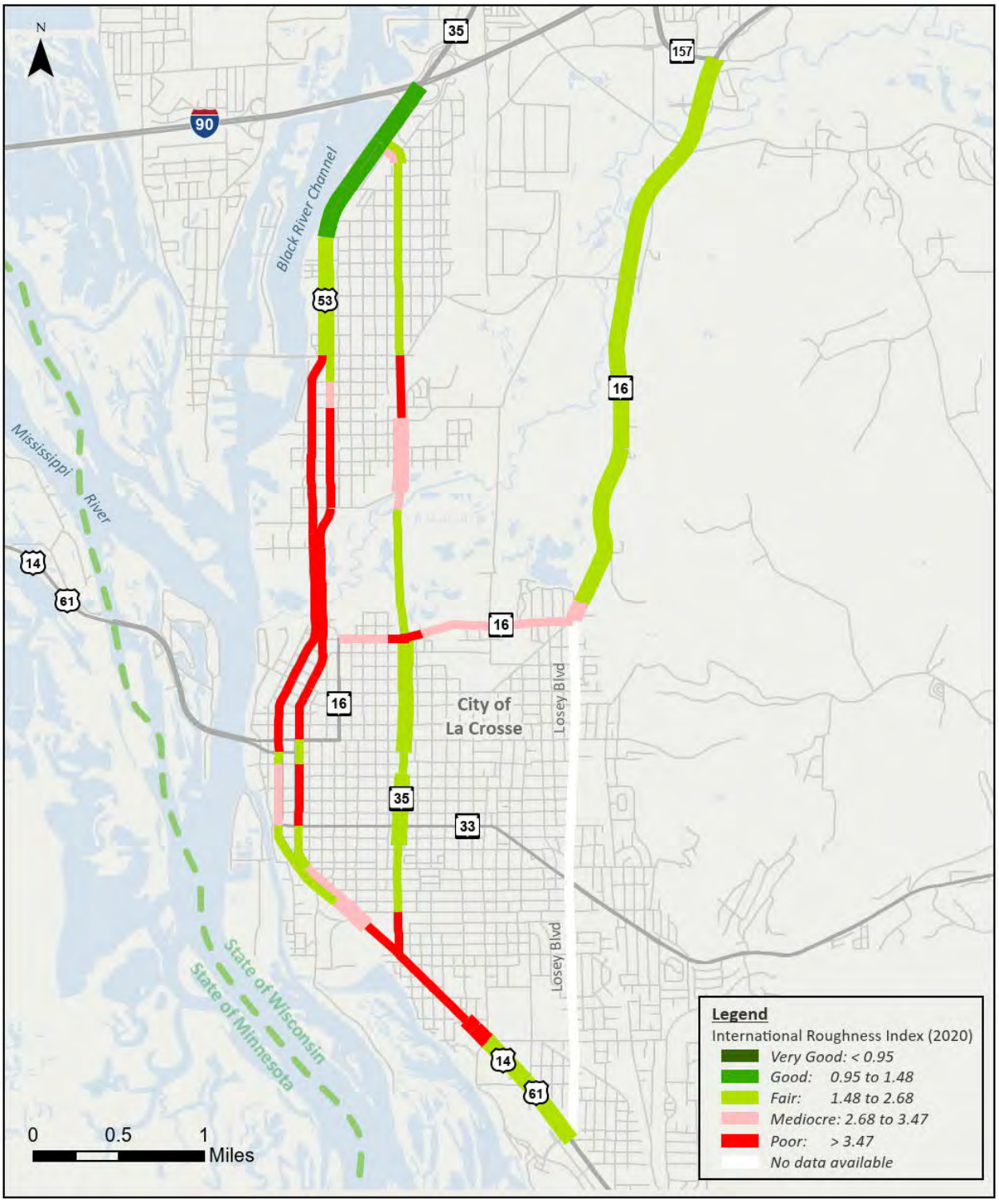
7.3 Pavement Rating

The existing pavement condition and future project information for the International Roughness Index (IRI) and Pavement Condition Index (PCI) was provided by the WisDOT SW-Region Programming section. The Pavement Surface Evaluation Rating (PASER) was obtained through the Wisconsin Information System for Local Roads. Individual routes within the study area were mapped for a visual representation within the study area.

IRI Rating

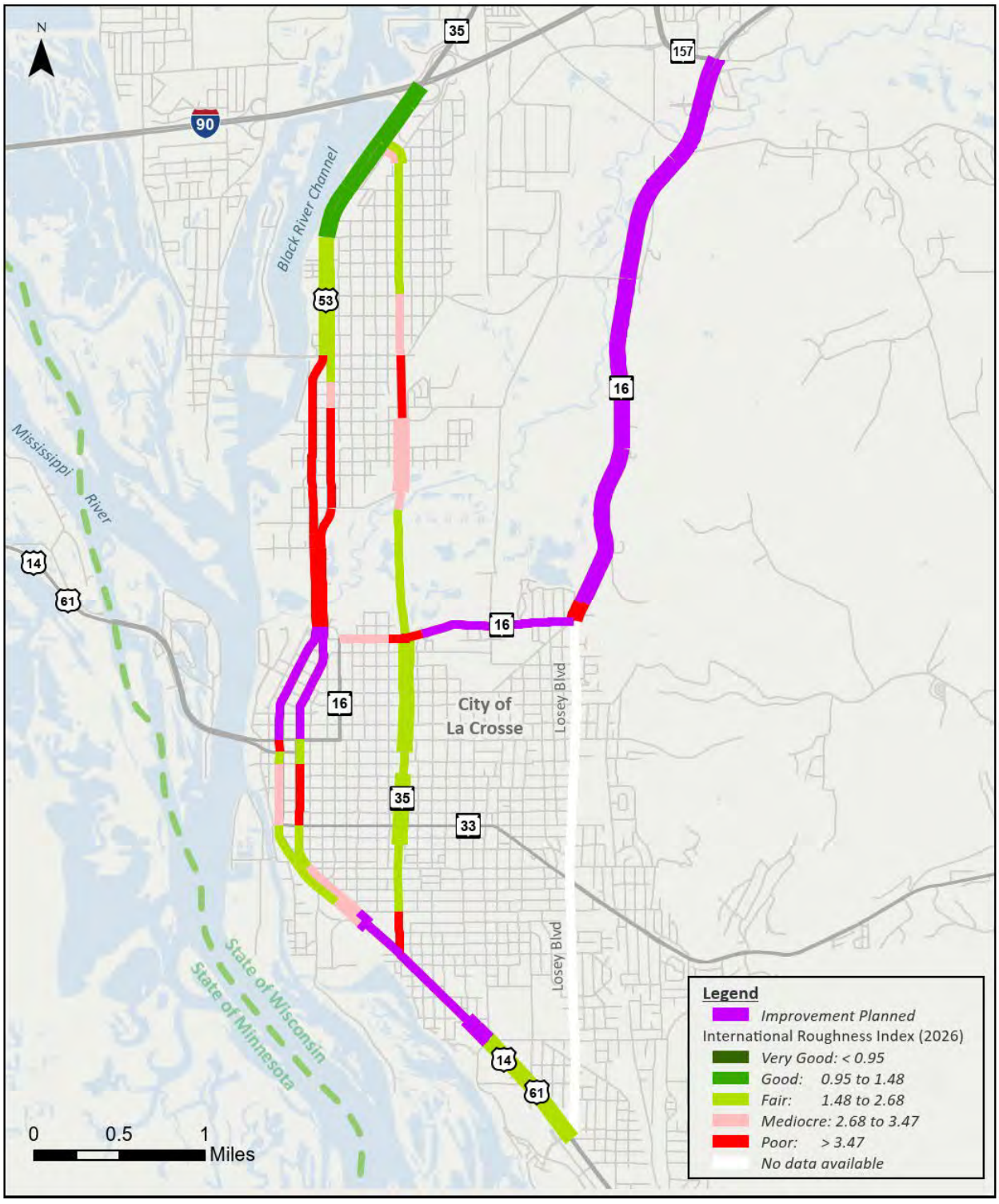
The IRI is a standardized roughness measurement along the longitudinal profile of a roadway and is measured as millimeters per meter (mm/m). For the purposes of this report, the IRI ranges from less than 0.95 for a Very Good rating to greater than 3.47 for a Poor rating with Good, Fair, and Mediocre ratings in between. The existing year (2020) IRI ratings are in Figure 23: Existing Year (2020) IRI Rating.

Figure 23: Existing Year (2020) IRI Rating



The future year (2026) IRI rating is based on projected values 6 years into the future and includes planned improvements within project segments. Future year IRI ratings are in Figure 24: Future Year (2026) IRI Ratings.

Figure 24: Future Year (2026) IRI Ratings



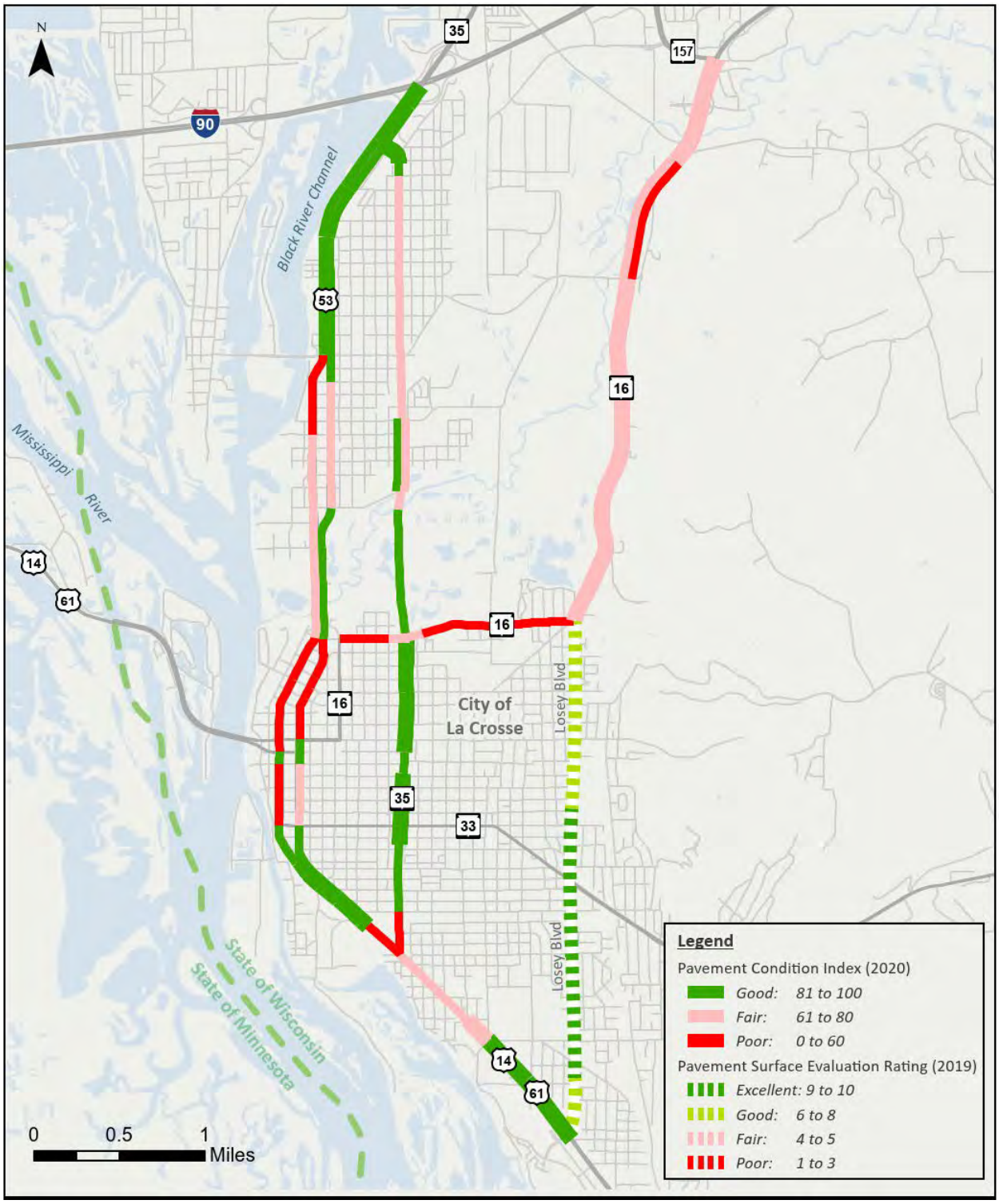
PCI and PASER Ratings

The PCI rating is a numerical index between 0 and 100 to generalize the condition of the pavement based on a visual survey of the number and types of distresses in a pavement. The PCI ranges selected for this study are 81-100 for Good, 61-80 for Fair, and 0-60 for Poor.

PCI ratings are not available on local roads, so the PASER rating is used. This rating, with a range from 1 to 10, is for road pavement condition based solely on a visual survey. For the purposes of this study, the ratings are categorized as 9-10 for Excellent, 6-8 for Good, 4-5 for Fair, and 1-3 for Poor.

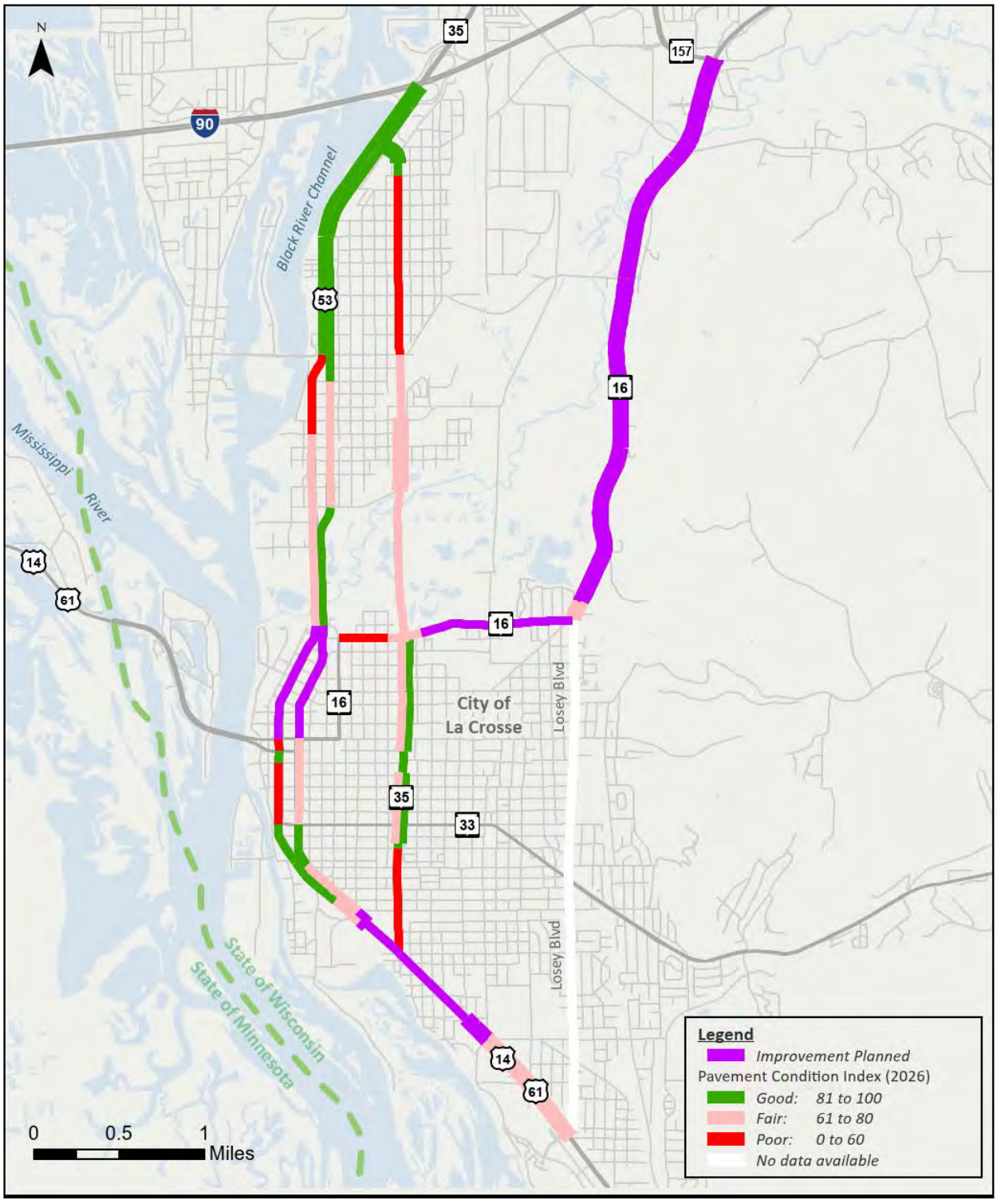
The existing year (2020) PCI and existing year (2019) PASER ratings are in Figure 25: Existing Year PCI and PASER Ratings.

Figure 25: Existing Year PCI and PASER Ratings



Similar to the future year IRI rating, the future year (2026) PCI Rating is based on projected values 6 years into the future. PASER ratings are provided only for the existing year, so no future year PASER rating is provided. Future year PCI Ratings are in Figure 26: Future Year PCI Ratings.

Figure 26: Future Year PCI Ratings



7.4 Pavement Condition Summary

The following is a summary of pavement condition issues identified for each project segment:

WIS 16 Segment

- 4% of the project segment has a future year IRI rating of “Poor.”

WIS 35 (Lang Dr, George St) Segment

- 28% of the project segment has a future year PCI rating of “Poor.”
- 15% of the project segment has a future year IRI rating of “Poor.”

US 53 (Rose St, Copeland Ave) Segment

- 2% of the project segment has a pavement age of more than 50 years.
- 7% of the project segment has a future year PCI rating of “Poor.”
- 43% of the project segment has a future year IRI rating of “Poor.”

WIS 16 (La Crosse St) Segment

- 19% of the project segment has a pavement age of more than 50 years.
- 18% of the project segment has a future year PCI rating of “Poor.”
- 26% of the project segment has a future year IRI rating of “Poor.”

Losey Blvd Segment

- 14% of the project segment has a pavement age of more than 50 years.

WIS 35 (West Ave) Segment

- 33% of the project segment has a future year PCI rating of “Poor.”
- 13% of the project segment has a future year IRI rating of “Poor.”

Downtown Segment

- 13% of the project segment has a pavement age of more than 50 years.
- 13% of the project segment has a future year PCI rating of “Poor.”
- 19% of the project segment has a future year IRI rating of “Poor.”

US 14/61 (South Ave, Mormon Coulee Rd) Segment

- 12% of the project segment has a pavement age of more than 50 years.

8. Next Steps

The next step in the La Crosse Safety & Operations Study will be the completion of the No-Build Conditions Report. This report will include the traffic operations evaluation of the existing roadway network under forecasted design year (2050) traffic conditions, and the Contributing Geometric Analysis step of the Safety Certification Process.

Appendix 1: Traffic Count Adjustment Factors Memo

AECOM
1350 Deming Way
Suite 100
Middleton, WI 53562

www.aecom.com
608 836 9800 telephone
608 836 9767 fax

Project name:
La Crosse Safety and Operations Study

Project ref:
WisDOT ID: 1630-08-00
AECOM ID: 60632550

To
Josh Koebernick

CC:
Rich Cannon
Ruchi Datta

From:
Jeff Sandberg

Date:
January 25, 2021

DRAFT

Memorandum

Subject: Traffic Count Adjustment Factors

INTRODUCTION

The purpose of this memo is to document the source and results of the traffic count adjustment factors used in the La Crosse Safety and Operations Study.

AECOM is working with the Wisconsin Department of Transportation (WisDOT) Southwest Region to complete a traffic operations and safety study of major north-south roadways in the City of La Crosse, WI. Due to COVID-19 – related traffic impacts, the traffic data collection effort largely relied on traffic data that was collected prior to the onset of the COVID-19 pandemic in early 2020. However, there are a handful of intersections where historic turning movement traffic data is not available. At 16 project intersection, turning movement traffic counts (TMCs) were taken in the fall of 2020 that need to be adjusted to be consistent with the pre-COVID historic traffic volumes. More detail is in the Traffic Data Collection Plan.

TMCs were gathered at 16 intersections within project limits. An exhibit showing these locations is attached. Data gathered for use in developing TMC adjustment factors includes:

- April, 2019 TMCs at adjacent intersections gathered for a City of La Crosse signal timing update project. These TMCs are the most widely used traffic volume source, and the purpose of the adjustment factors is to adjust the September, 2020 TMCs to approximate April, 2019 (i.e. pre-COVID) traffic volumes.
- April, 2019 and September, 2020 traffic volumes from six Automated Traffic Recorder (ATR) locations within the City of La Crosse.
- April, 2019 and September, 2020 TMCs at adjacent intersection gathered from Gridsmart traffic cameras at WisDOT-maintained signalized intersections.
- 2017 coverage counts near the project intersections.

The availability of these traffic data sources is different at each intersection, so each intersection will be treated independently in terms of an adjustment factor calculation method. The three methods for calculating traffic adjustment factors are as follows:

1. If an ATR is located near the intersection, use ATR volumes from April, 2019 and September, 2020 to develop an adjustment factor. Unless one of the traffic adjustment methods applies to the side road, adjust side road traffic by the same percentage as the mainline.
2. If method 1 is not an option and a signalized intersection with a Gridsmart camera is located near the intersection, use Gridsmart traffic volumes from April, 2019 and September, 2020 to develop an adjustment factor. Unless one of the traffic adjustment methods applies to the side road, adjust side road traffic by the same percentage as the mainline.

3. If methods 1 and 2 are not options, use traffic volumes from the nearest coverage count to develop an adjustment factor. Unless one of the traffic adjustment methods applies to the side road, adjust side road traffic by the same percentage as the mainline.

The adjustment factors derived from each traffic count location are in tables 1, 2, and 3 below.

Table 1, Traffic Volumes and Adjustment Factors – ATR Locations

Location	Tuesdays in April, 2019 (Average)		Tuesday, September 29, 2020		Adjustment Factor	
	AM	PM	AM	PM	AM	PM
320409 (USH53/Rose St, South of Livingston)	2,124	2,305	1,575	1,950	1.35	1.18
320592 (USH 14/61/South Ave, between Tyler and Farnam)	1,965	2,094	1,421	1,632	1.38	1.28
326114 (USH 14/61/STH 35, South of Marion)	1,788	2,039	1,370	1,816	1.31	1.12
326116 (STH 35, North of Mississippi St)	1,559	1,682	1,177	1,541	1.32	1.09
326118 (USH 53, between Grove St & La Crosse River)	2,307	2,709	1,612	2,232	1.43	1.21
326119 (STH 16, North of Bluff Pass)	3,089	3,581	2,186	2,949	1.41	1.21

Table 2, Traffic Volumes and Adjustment Factors – Gridsmart Locations

Location	Tuesday, April 30, 2019		Tuesday, September 29, 2020		Adjustment Factor	
	AM	PM	AM	PM	AM	PM
0264 (STH 16 & STH 157)	3,841	4,866	2,390	3,436	1.61	1.42
0337 (STH 16 & CTH B/Conoco Rd)	3,354	3,550	2,080	3,289	1.61	1.08
01 (USH 53 / Rose St & Clinton St)	2,042	2,365	1,529	1,853	1.34	1.28

Table 3, Traffic Volumes and Adjustment Factors – Coverage Count Locations

Location	Fall, 2017 (Average Weekday)		Tuesday, September 29, 2020		Adjustment Factor	
	AM	PM	AM	PM	AM	PM
320486 (King St, between 2nd St and 3rd St)	134	260	53	105	2.53	2.48
320581 (Losey Blvd, between Farnam St and State Rd)	2,334	2,268	1,828	2,296	1.28	1.00*
320588 (Losey Blvd, between Green Bay St and Travis St)	1,701	1,896	1,002	1,447	1.70	1.31
320612 (Weston St, between 22nd St and Losey Blvd)	225	130	93	102	2.42	1.27
320876 (Gillette St, between Caledonia St and Rose St)	406	499	150	263	2.71	1.90
321116 (STH 16 / 7th St, S of La Crosse St)	721	695	296	495	2.44	1.40
321270 (SB STH 16 to WB 12th Ave Ramp)	25	51	24	50	1.04	1.02
321271 (EB 16th Ave Ramp to SB STH 16)	28	24	18	22	1.56	1.09

* The calculated value was less than 1, so 1.00 was used.

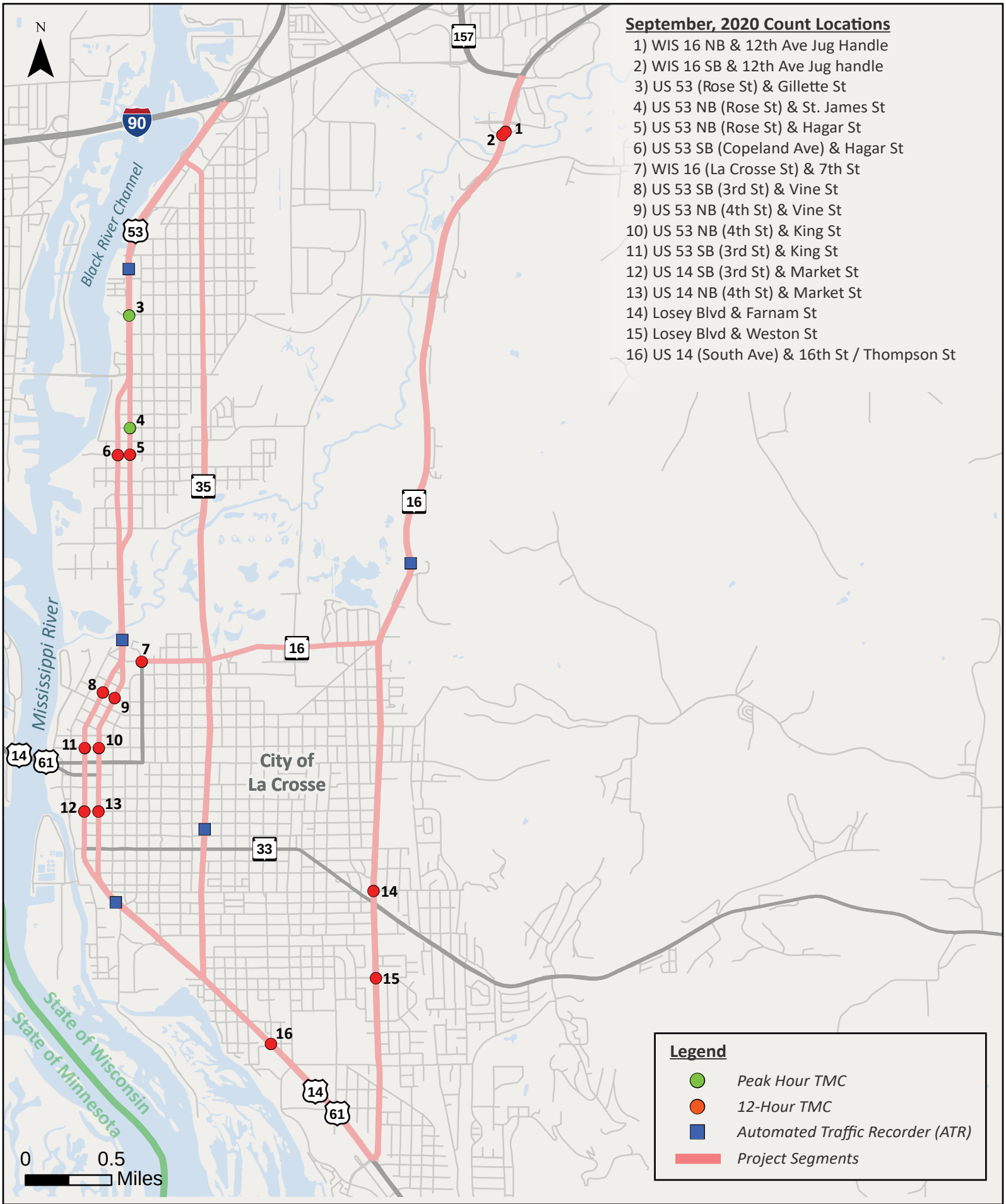
The traffic adjustment factors used at each intersection are in Table 4 below. When two locations are listed in the "source" column, the adjustment factor used at that intersection is an average of the adjustment factors at those two locations.

Table 4, Intersection Traffic Count Adjustment Factors							
Intersection	**Adjustment Method**	**Mainline Adjustment Factor**			**Side Road Adjustment Factor**		
		Source	**AM**	**PM**	**Source**	**AM**	**PM**
1. WIS 16 NB & 12th Ave Jughandle	2	0264, 0337	1.61	1.25	0264, 0337	1.61	1.25
2. WIS 16 SB & 12th Ave Jughandle	2 (ML), 3 (SR)	0264, 0337	1.61	1.25	321270, 321271	1.30	1.06
3. US 53 (Rose St) & Gillette St	1 (ML), 3 (SR)	320409	1.35	1.18	320876	2.71	1.90
4. US 53 (Rose St) & St James St	2	01	1.34	1.28	01	1.34	1.28
5. US 53 NB (Rose St) & Hagar St	2	01	1.34	1.28	01	1.34	1.28
6. US 53 SB (Copeland Ave) & Hagar St	2	01	1.34	1.28	01	1.34	1.28
7. WIS 16 (La Crosse St) & 7th St	1 (ML), 3 (SR)	326118	1.43	1.21	321116	2.44	1.40
8. US 53 SB (3rd St) & Vine St	1	326118	1.43	1.21	326118	1.43	1.21
9. US 53 NB (4th St) & Vine St	1	326118	1.43	1.21	326118	1.43	1.21
10. US 53 NB (4th St) & King St	1	326118	1.43	1.21	326118	1.43	1.21
11. US 53 SB (3rd St) & King St	1 (ML), 3 (SR)	326118	1.43	1.21	320486	2.53	2.48
12. US 14 SB (3rd St) & Market St	1	320592	1.38	1.28	*	*	*
13. US 14 NB (4th St) & Market St	1	320592	1.38	1.28	*	*	*
14. Losey Blvd & Farnam St	3	320581	1.28	1.00	320581	1.28	1.00
15. Losey Blvd & Weston St	3 (ML), 3 (SR)	320588	1.70	1.31	320612	2.42	1.27
16. US 14 (South Ave) & 16th St	1	320592, 326114	1.35	1.19	320592, 326114	1.35	1.19

* Market Street was closed at the time traffic counts were obtained. Traffic volumes approximated based on 2017 AADT volumes.

Once these adjustment factors were applied, if traffic volumes had a 10% difference or more when compared to a nearby adjacent intersection, volume balancing was completed to bring the volume difference below 10%. For intersections located between two nearby adjacent intersections, volume balancing was completed to evenly distribute this difference. The volume balancing was completed by using an iterative process to select the appropriate volume balancing factor. Volume balancing factors are in Table 5 below.

Table 5, Volume Balancing Factors				
Intersection	**AM**		**PM**	
	NB/EB	**SB/WB**	**NB/EB**	**SB/WB**
1. WIS 16 NB & 12th Ave Jughandle	0.75	-	0.88	-
2. WIS 16 SB & 12th Ave Jughandle	-	1.05	-	1.02
3. US 53 (Rose St) & Gillette St	-	0.95	-	-
4. US 53 (Rose St) & St James St	-	-	0.90	-
5. US 53 NB (Rose St) & Hagar St	-	-	0.94	-
6. US 53 SB (Copeland Ave) & Hagar St	-	0.95	-	0.86
7. WIS 16 (La Crosse St) & 7th St	-	0.73	0.85	-
8. US 53 SB (3rd St) & Vine St	-	1.26	-	1.24
9. US 53 NB (4th St) & Vine St	1.19	-	1.23	-
10. US 53 NB (4th St) & King St	1.31	-	1.09	-
11. US 53 SB (3rd St) & King St	-	0.89	-	1.31
12. US 14 SB (3rd St) & Market St	-	0.87	-	-
13. US 14 NB (4th St) & Market St	1.21	-	0.94	-
14. Losey Blvd & Farnam St	0.99	-	-	0.93
15. Losey Blvd & Weston St	0.88	0.81	0.93	0.85
16. US 14 (South Ave) & 16th St	-	-	-	-



Traffic Count Locations (September, 2020)

La Crosse Safety and Operations Study

December 2021

WisDOT ID: 1630-08-00

Appendix 2: Traffic Data Collection Plan

AECOM
1350 Deming Way
Suite 100
Middleton, WI 53562

www.aecom.com
608 836 9800 telephone
608 836 9767 fax

Project name:
La Crosse Safety and Operations Study

Project ref:
WisDOT ID: 1630-08-00
AECOM ID: 60632550

To
Steve Marshall
Ruchi Dutta

From:
Jeff Sandberg

CC:
Andrew Winga
Kimberly Schauder
Michael Hoelker

Date:
August 14, 2020

DRAFT

Memorandum

Subject: Traffic Data Collection Plan

INTRODUCTION

AECOM is working with the Wisconsin Department of Transportation (WisDOT) Southwest Region to complete a traffic operations and safety study of major north-south roadways in the City of La Crosse, WI. The La Crosse Safety and Operations Study will require an extensive data collection effort for all project roadways included in the study area. This memo will identify the available sources of traffic data and the methodologies for collecting the traffic data required for this project. Additionally, it will document how data will be collected to account for the traffic impacts experienced on the transportation system due to COVID-19.

See ***Attachment A*** for a location map of the study area.

DATA COLLECTION OVERVIEW

The La Crosse Safety and Operations Study will require the following data to be collected by the following representatives, as originally planned:

- Traffic Count Data
  - Gather Gridsmart data from WisDOT (7 intersections)
  - City of La Crosse provided turning movement counts (3 intersections)
  - 12-hour turning movement counts (18 intersection) collected by Spack Solutions
  - 6-hour weekday peak hour turning movement counts (38 Intersections) collection by Spack Solutions
  - 48-hour AADT counts (17 Locations) collected by Spack Solutions
- Origin Destination Data
  - Collect OD Data from the La Crosse Area Planning Committee (LAPC) Travel Demand Model
  - Collect O-D data form the Streetlight travel demand website
- Traffic Forecast Data Provided by the WisDOT Traffic Forecasting Unit

COVID-19 IMPACTS

The Wisconsin transportation system saw immediate impacts as a result of the COVID-19 outbreak experienced across the country, and due to the action taken by Governor Evers in signing Executive Order #72 declaring a public health emergency on March 13, 2020, and a “Safer at Home Order” issues on March 24, 2020. WisDOT published a COVID-19 Traffic Data Collection Interim Policy as a result of the reduced traffic volumes experienced across the state of Wisconsin. See ***Attachment B*** for details on the Interim WisDOT Policy.

The interim policy for collecting data after July 31, 2020 included three critical questions to be addressed prior to beginning a traffic data collection effort. These questions are addressed below, including how this policy will be incorporated into this study’s data collection effort.

1. Have traffic volumes in the project influence area been stable for at least one month?

   Continuous traffic count data was collected along all the study corridors to determine the monthly fluctuations of peak hour traffic volumes. ATR data was collected at the following locations from February 2020 through July 2020:

   - Site 320409 – USH 53 Rose South of Livingston
   - Site 320592 – USH 14/USH 61 South Ave Btwn Tyler & Farnam
   - Site 326116 – STH 35 – North of Mississippi St
   - Site 326118 – USH 53 – Btwn Grove St & La Crosse River – Copeland Ave
   - Site 326119 – STH 16 North of Bluff Pass

   Gridsmart data was collected at the following intersection from February 2020 through July 2020:

   - STH 16 & STH 157
   - STH 35 & George Street
   - USH 53 & Palace Street
   - USH 53 & STH 35

   See ***Attachment C*** for a chart depicting the results of this data comparison.

   This data indicates traffic volume fluctuations have decreased throughout the summer of 2020 with June 2020 having approximately 17% higher traffic volumes than May 2020, and July 2020 having approximately 5% higher traffic volumes than June 2020. This meets the BTO guidance of fluctuations being less than 20%. However, it's unclear how much of these month-to-month increases are due to higher traffic volumes in the summer months versus a return to "normal" traffic conditions. It was also noted that traffic volumes in July were still down ~20% compared to July, 2019.

2. Are businesses in the project influence area open and have they resumed normal operations?

   Business in the state of Wisconsin have been reopening in a phased approach following criteria outlined in the "Badger Bounce Back Plan". It is still unknown when Wisconsin business will be back to 'normal' operation. A Majority of Wisconsin businesses are open under certain capacity restrictions or other necessary health and safety measures.

3. Are schools in the project influence area open per normal, pre-COVID conditions?

   The La Crosse school district had students begin virtual learning to end the 2019-2020 school year in April and May 2020. Through coordination with the County Health Department and due to the uncertain situation moving forward, the school district currently plans to start the 2020-2021 school year with virtual learning for all students 4K-12.

   The La Crosse school district plans to re-evaluate their current plan by mid-September. Once in-person learning is approved, the plan is to implement a blended learning environment where the majority of learning will be online with some students phased in for face-to-face learning at all schools. The school district is also offering online learning at the "Coulee Region Virtual Academy" to any student that wants a 100% online learning experience.

   The University of Wisconsin-La Crosse (UWL) is planning to offer a mix of on-campus, virtual, and hybrid classes for the fall semester. All on-campus classes will be provided at a reduced capacity, masks will be required on campus, more virtual options will be provided, and additional safety measures will be implemented per guidance provided from the CDC and the County Health Department.

   Viterbo University plans to resume on-campus classes for the fall semester, barring any government health directives to the contrary.

The responses to these questions indicates the COVID-19 pandemic is still affecting traffic conditions in the study area. Therefore, alternate methods will be used for this study to supplement or replace existing traffic data under COVID-19 conditions.

ALTERNATE DATA COLLECTION METHODS

The La Crosse study will primarily utilize historical traffic data, where available, and supplemental traffic data where required. Below is a summary of these alternate data collection methods:

- 66 Total Intersections in the study area require turning movement counts.
  - 42 signalized intersections will utilize 2019 City of La Crosse provided counts from a City-wide signal re-timing effort. This historical data included peak hour turning movement counts from Spring, 2019.

  - 16 intersections will require counts to be collected under the current COVID-19 conditions. Adjustment factors will be developed and applied to these volumes to account for current traffic conditions.
    - 2 signalized intersections and 14 un-signalized intersections.
  - 7 signalized intersections will utilize 2019 WisDOT Gridsmart data.
  - 1 signalized intersection will utilize 2019 City of La Crosse Gridsmart data.
- Traffic conditions will be re-evaluated post-COVID to determine if 48-hour AADT traffic data (17 locations) and additional turning movement counts (up to 51 locations) will be collected.

See ***Attachment D*** for a list of intersections to be counted under COVID-19 conditions.

The project team will continue to re-evaluate the traffic conditions as COVID-19 impacts continue to develop. At the peak of the COVID-19 pandemic, it was determined that traffic volumes in the study area were on average 45% lower in the month of April 2020 compared to April 2019. The difference between 2019 and 2020 traffic volumes has been decreasing since that time, and as of July 2020, volumes are 20% lower than July 2019 traffic volumes. This difference is expected to continue decreasing, but it's possible traffic volumes and patterns may never return to pre-COVID conditions.

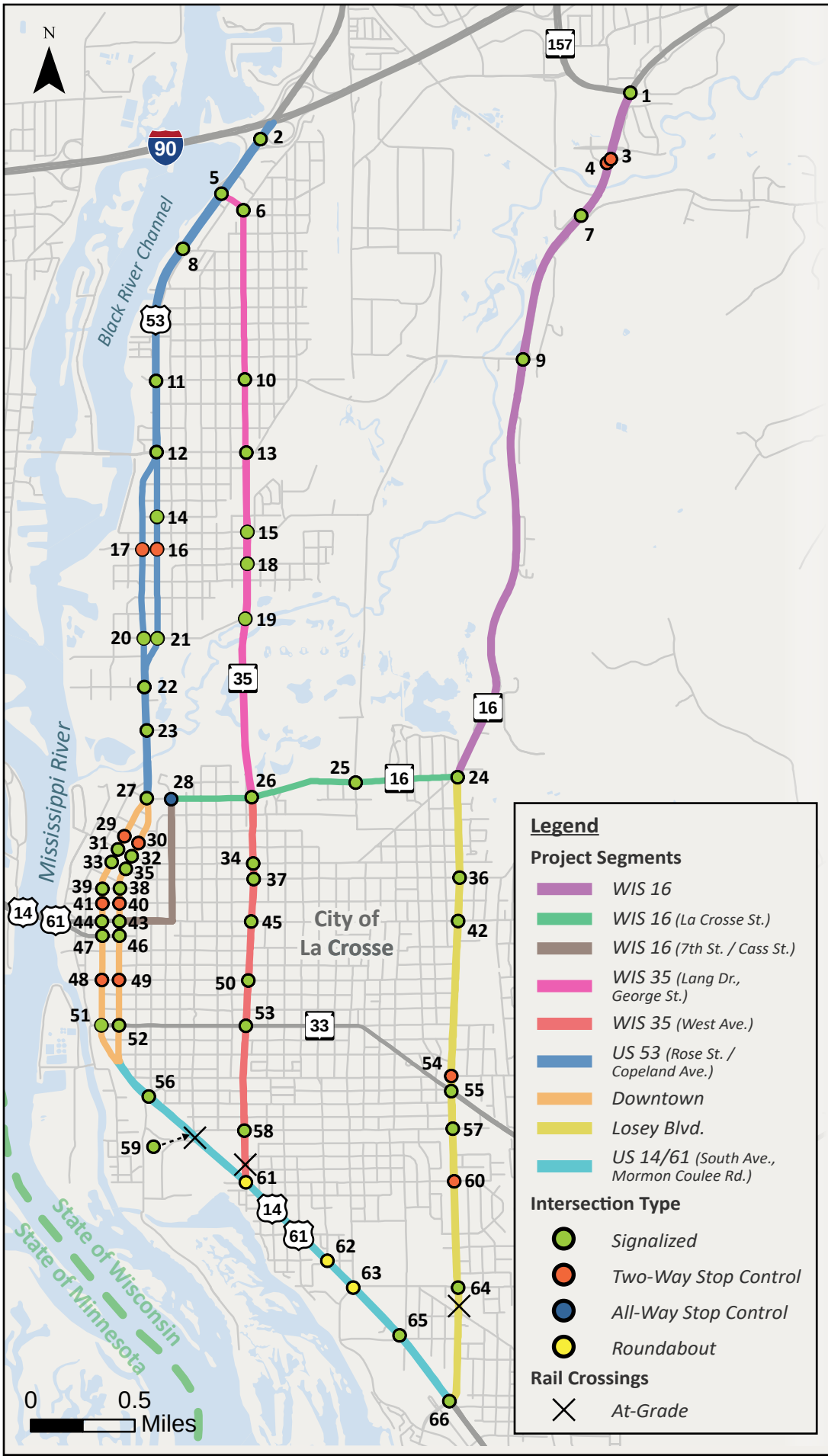
See ***Attachment E*** for a comparison of 2020 traffic volumes to 2019 traffic volumes.

DATA COLLECTION SCHEDULE

The table below summarizes the anticipated schedule to collect traffic data for this study.

Table 1: Traffic Data Collection Schedule

Data	Schedule to Collect Data
TMC - 2019 City of La Crosse Provided	July, 2020
TMC – Gridsmart Data	Late September, 2020
TMC - Under COVID-19 Conditions	Late September, 2020
TMC - Traffic Forecast Request	October, 2020
AADT Traffic Data	TBD
AADT – Traffic Forecast	TBD
TMC – Re-counting Data	TBD



Project Intersections

1) WIS 16 & WIS 157
2) US 53 & I-94 EB On Ramp
3) WIS 16 NB & 12th Ave Jug Handle
4) WIS 16 SB & 12th Ave Jug handle
5) US 53 (Rose St) & WIS 35
6) WIS 35 & George St
7) WIS 16 & County B
8) US 53 (Rose St) & Palace St
9) WIS 16 & Gillette St
10) WIS 35 (George St) & Gillette St
11) US 53 (Rose St) & Gillette St
12) US 53 (Rose St) & Clinton St
13) WIS 35 (George St) & Clinton St
14) US 53 NB (Rose St) & St. James St
15) WIS 35 (George St) & St Cloud St
16) US 53 NB (Rose St) & Hagar St
17) US 53 SB (Copeland Ave) & Hagar St
18) WIS 35 & St. Andrews St
19) WIS 35 (West Ave) & Monitor St
20) US 53 SB (Copeland Ave) & Monitor St
21) US 53 NB (Rose St) & Monitor St
22) US 53 (Copeland Ave) & Causeway Blvd
23) US 53 (Copeland Ave) & River Bend Dr
24) WIS 16 (La Crosse St) & Losey Blvd
25) WIS 16 (La Crosse St) & East Ave
26) WIS 35 (West Ave) & WIS 16 (La Crosse St)
27) US 53 (Copeland Ave) & La Crosse St
28) WIS 16 (La Crosse St) & 7th St
29) US 53 SB (3rd St) & Vine St
30) US 53 NB (4th St) & Vine St
31) US 53 SB (3rd St) & State St
32) US 53 NB (4th St) & State St
33) US 53 SB (3rd St) & Main St
34) WIS 35 (West Ave) & State St
35) US 53 NB (4th St) & Main St
36) Losey Blvd & Main St
37) WIS 35 (West Ave) & Main St
38) US 53 (4th St) & Jay St
39) US 53 (3rd St) & Jay St
40) US 53 NB (4th St) & King St
41) US 53 SB (3rd St) & King St
42) Losey Blvd & Cass St
43) US 53 NB (4th St) & US 14 WB (Cass St)
44) US 53 SB (3rd St) & US 14 WB (Cass St)
45) WIS 35 (West Ave) & Cass St
46) US 53 NB (4th St) & US 14 EB (Cameron Ave)
47) US 53 SB (3rd St) & US 14 EB (Cameron Ave)
48) US 14 SB (3rd St) & Market St
49) US 14 NB (4th St) & Market St
50) WIS 35 (West Ave) & Market St
51) US 14 SB (3rd St) & WIS 33 (Jackson St)
52) US 14 NB (4th St) & WIS 33 (Jackson St)
53) WIS 35 (West Ave) & WIS 33 (Jackson St)
54) Losey Blvd & Farnam St
55) WIS 33 (State Rd) & Losey Blvd
56) US 14 (South Ave) & 7th St
57) Losey Blvd & Green Bay St.
58) WIS 35 (West Ave) & Green Bay St
59) US 14 (South Ave) & Green Bay St
60) Losey Blvd & Weston St
61) US 14 (South Ave) & WIS 35 (West Ave)
62) US 14 (South Ave) & 16th St / Thompson St
63) US 14 (South Ave) & Ward Ave
64) Losey Blvd & Ward Ave
65) US 14 & 21st St / Victory St
66) US 14 (Mormon Coulee Rd) & Losey Blvd

Project Location Map

La Crosse Safety and Operations Study

December 2021

WisDOT ID: 1630-08-00

WISCONSIN DEPARTMENT OF TRANSPORTATION

WisDOT Division of Transportation System Development
Bureau of Traffic Operations
4822 Madison Yards Way, 5th Floor South
Madison, WI 53705

Governor Tony Evers
Secretary Craig Thompson
wisconsindot.gov
(608) 266-1260
william.mcnary@dot.wi.gov

Date: June 10, 2020

To: Planning Chiefs
PDS Chiefs
Ops Chiefs

cc: Tom Ries, Data Management Section Chief
Brian Porter, Traffic Forecasting Section Chief

From: William R. McNary, P.E.
State Traffic Engineer

Subject: COVID-19 Traffic Data Collection Interim Policy

INTRODUCTION

In response to the COVID-19 Coronavirus, Governor Evers signed Executive Order #72 declaring a public health emergency on March 13, 2020. On March 24, 2020, Governor Evers issued a "Safer at Home Order." These orders resulted in the statewide closure of all K-12, primary and secondary, Wisconsin schools effective March 16, 2020 followed by the closure of all non-essential businesses starting on March 25, 2020. Most Wisconsin universities started closing dormitories and moving all instruction to online classes beginning the week of March 15th. Where possible, non-essential workers began to telework as early as March 1, 2020.

The Wisconsin Supreme Court overturned the statewide "Safer at Home Order" on May 13, 2020. Wisconsin K-12 schools continue to remain closed for the duration of the 2019-2020 school year. Immediately after the May 13, 2020 Supreme Court ruling, some individual counties within the State of Wisconsin began to issue their own county-specific safer at home orders, while other counties began to allow the gradual reopening of the non-essential businesses.

The reopening of Wisconsin businesses is occurring in a phased approach following the gating criteria outlined in the Badger Bounce Back Plan. As such, it is unknown when Wisconsin businesses and schools will be fully open. Even when businesses and schools are fully operational, it will take months or even years to rebound from the impacts of COVID-19, and post-COVID conditions may be very different from pre-COVID conditions.

Even in this time of uncertainty, improvement projects and new development continues, creating the need for guidance as it pertains to the collection of traffic data including: link and turning movement traffic volumes, pedestrian and bicycle volumes, truck volumes/percentages, speeds, travel times, origin-destination patterns, and queue lengths among others. This memorandum will serve as the COVID-19 Traffic Data Collection Interim Policy. **This interim policy is effective immediately and will remain in effect until rescinded.**

NEW TRAFFIC DATA COLLECTION

The following traffic data collection criteria **shall** apply to all projects on the Wisconsin State Trunk Network (STN), including those on connecting highways. Although not a requirement, the Wisconsin Department of Transportation (WisDOT) encourages local projects, specifically those interested in receiving federal or state funds, to follow the COVID-19 Traffic Data Collection Interim Policy outlined below.

Prior to March 1, 2020:

- Traffic data considered to represent pre-COVID conditions.
- Apply adjustments factors per the Wisconsin Facilities Development Manual Chapter 11, Section 5-3.5 (FDM 11-5-3) and Transportation Planning Manual Chapter 9, Section 40 (TPM 9-40).
- Refer to the Traffic Engineering, Operations and Safety Manual Chapter 16, Section 5 (TEOpS 16-5) for additional information on data assembly and preparation.

Between March 1, 2020 and July 31, 2020:

- Considered to represent COVID-19 conditions.
- Analyst **shall not** use traffic data collected during this time for planning or design.
- Traffic data may serve as a reference for COVID-19 impacts.
- Refer to the following section to develop existing traffic conditions.

After July 31, 2020

- Traffic is unlikely to return to normal prior to July 31, 2020, and normal post-COVID may be very different from normal pre-COVID. This date is subject to change and may vary by location. Consult with the WisDOT regional traffic engineer to confirm prior to any new data collection efforts.
- Project influence area, as referenced below, is the geographical area surrounding the site from which the project is likely to draw a high percentage of its trips.
- WisDOT regional traffic engineer **shall** use professional judgment and consider the following questions when assessing whether to go ahead with new traffic data collection:

    1) *Have traffic volumes in the project influence area been stable for at least one month?*
        - Traffic volumes are stable when the weekly fluctuation in traffic is minimal, typically no more than 20%. In other words, the traffic count (daily and hourly) for a given day of the week for the past four weeks (e.g., Tuesday from week 1, week 2, week 3 and week 4) are all within 20% of one another with no apparent trend of decreasing or increasing volumes.
        - Although typically 20%, the acceptable range of variance may differ depending on the type of facility (primary arterial, minor arterial, etc.) and location. Other factors, such as special events, holidays, and incidents to name a few, may also affect the acceptable range of variance.
        - Stabilization of traffic volumes may vary by region, county, and municipality.
        - Traffic volumes may stabilize on recreational/tourism routes before they stabilize on commuter routes, or vice versa.
        - Coordinate with the WisDOT Traffic Data Unit (traffic.counts@dot.wi.gov) to obtain traffic volume patterns, acceptable range of variance and other criteria for determining volatility of traffic volumes.
    2) *Are businesses in the project influence area open and have they resumed normal operations?*
        - The WisDOT regional traffic engineer or project manager **shall** coordinate with local business owners to assess if the business has resumed operation and if not to assess when or if the business plans to reopen.
        - Ideally, all businesses in the project influence area *should* be open prior to proceeding with data collection. However, post-COVID operations may never return fully to pre-COVID conditions. Some businesses may close permanently,

other businesses may re-open but have fewer customers, while some businesses may continue to promote teleworking and thus have fewer on-site employees. Additionally, there may be other unknown permanent impacts to businesses.

- If a business that plans to re-open is closed at the time of the traffic data collection, the analyst **shall** add the trip generation potential from the closed businesses in accordance with the WisDOT Traffic Impact Analysis (TIA) Guidelines.
- It may be acceptable to use historical counts (e.g., driveway counts, intersection counts where the business is the primary generator of traffic on one or more of the intersection legs) to estimate the trip generation of temporarily-closed businesses. If using historical count data, the analyst **shall** take into consideration any potential reduction or increase in trip generation associated with permanent changes from the COVID-19 pandemic (e.g., fewer in store customers, less staff, increase in deliveries, etc.).

3) *Are schools in the project influence area open per normal, pre-COVID conditions?*

- The WisDOT regional traffic engineer or project manager **shall** coordinate with the local school district and universities to assess if the school/university has resumed normal operation and if not to find out when the school/university plans to resume normal operation.
- Ideally, all K-12, primary and secondary, schools and universities in the project influence area *should* have resumed on-site/classroom instruction. Some educational facilities, however, may never fully return to pre-COVID operations.
- As of the publication of this document, it is unknown whether K-12, primary and secondary, schools in Wisconsin will continue full or partial virtual learning into the fall 2020 semester.
- Universities may choose to convert some or all curriculum to fulltime on-line classes.
- Any counts taken when schools are operating at atypical conditions, **shall** be adjusted either through the use of the WisDOT TIA Guidelines trip generation procedures or through utilization of historical school driveway/access counts. Confirm the methodology for adjusting the traffic counts with the WisDOT regional traffic engineer.

- If the answer to all three of the questions above is Yes, then traffic data collection *may* resume. Apply adjustments factors per the FDM 11-5-3 and TPM 9-40. Refer to TEOpS 16-5 for additional information on data assembly and preparation.
- If the answer to any of the questions above is No, the COVID-19 pandemic is still affecting traffic conditions in the area. The WisDOT regional traffic engineer *should* defer the collection of any new traffic data. Refer to the following section to develop existing traffic conditions.

ESTABLISHING EXISTING TRAFFIC CONDITIONS UNDER COVID-19 CONDITIONS

Under COVID-19 conditions, traffic volumes and other traffic data such as travel speeds and travel times, may not give a realistic representation of existing conditions. Analyst may use the following alternate methods to supplement or replace existing traffic data under COVID-19 conditions.

Use of Historical Data

Under COVID-19 conditions, instead of collecting new traffic data, the analyst *should* assemble the most recent historical traffic data available.

WisDOT has access to or maintains existing databases of traffic count, speed, and other transportation data. The Bureau of Traffic Operations (BTO) - Traffic Analysis and Safety Unit (TASU) Data Hub provides a list potential sources of historical data. Coordinate with WisDOT regional traffic staff to verify other potential sources of data. Other resources for finding data sources include WisDOT Bureau of State Highway Programs (BSHP) and WisDOT Traffic Forecasting Section (TFS).

Where possible, try to assemble historical traffic volume, speed, travel time, and origin-destination data from the same month and year.

When using historical traffic data, consider the following:

- WisDOT will typically accept traffic data collected between January 1, 2017 and February 29, 2020 as being reflective of existing conditions.[1] Coordinate with the WisDOT regional traffic staff to confirm validity of traffic data.
- If there have been no major changes in land use or roadway network (e.g., addition of a new by-bass route), historical counts may be valid regardless of age.
- Coordinate with WisDOT TFS (DOTTrafficForecasting@dot.wi.gov) to select applicable growth rates or obtain traffic forecasts as necessary to adjust the historical traffic data to reflect existing conditions.
- For microsimulation analyses, for traffic data (volumes, speeds, travel times, origin-destination patterns, etc.) collected between January 1, 2017 and February 29, 2020, use the historical date as the base year for the traffic model as this will allow for easier model calibration. For traffic data collected prior to January 1, 2017, coordinate with BTO-TASU (DOTTrafficAnalysisModeling@dot.wi.gov) to identify the appropriate year to use for the microsimulation base year model.
- When using historical data prior to January 1, 2017, consider performing sensitivity analyses specifically when the need for improvements are borderline.

Use of Supplemental Traffic Data

Supplemental data may be necessary to fill in gaps where historical traffic data, specifically turning movement counts, is not available. Following are some supplemental sources of data:

- Historical origin-destination data, and corresponding proportion of turning movements, may be available from third-party vendor big data providers (e.g., Streetlight, INRIX). The WisDOT TFS may be able to aid with the use of big data, specifically Streetlight data.
- Use the relative turning movement ratios from the big data provider in combination with hourly or annual average daily traffic (AADT) volumes on the intersection approaches to estimate turning movement volumes.
- More research is necessary to confirm the validity of third-party big data turning movement counts. As such, until further notice, do not use the third-party big data turning movement volume counts directly.
- In absence of turning movement count data, Fratar Factoring[2] may be useful for transforming relative turning movement ratios, origin-destination matrices, or daily intersection approach volumes into turning movement counts.
- Use the BTO-TASU volume balancing tools, or similar tools, to smooth out differences between counts from various times, days or years or to fill in data gaps along a corridor. TEOpS 16-5-15.4.3 provides additional details on the BTO-TASU volume balancing tools.

[1] For this to be true, no new development, construction, or modifications to the roadway network shall have occurred since the collection of the traffic data.

[2] Fratar Factoring is a statistical technique where the rows and columns of and origin-destination matrix have multipliers optimized to factor up the sample to match (as close as possible) the target values by minimizing the sum of least squares.

- Use the trip generation and distribution methodologies outlined in the WisDOT TIA Guidelines to estimate additional traffic associated with new development or temporarily closed facilities.

Coordinate with the WisDOT regional traffic engineer to assess when and how to use supplemental data.

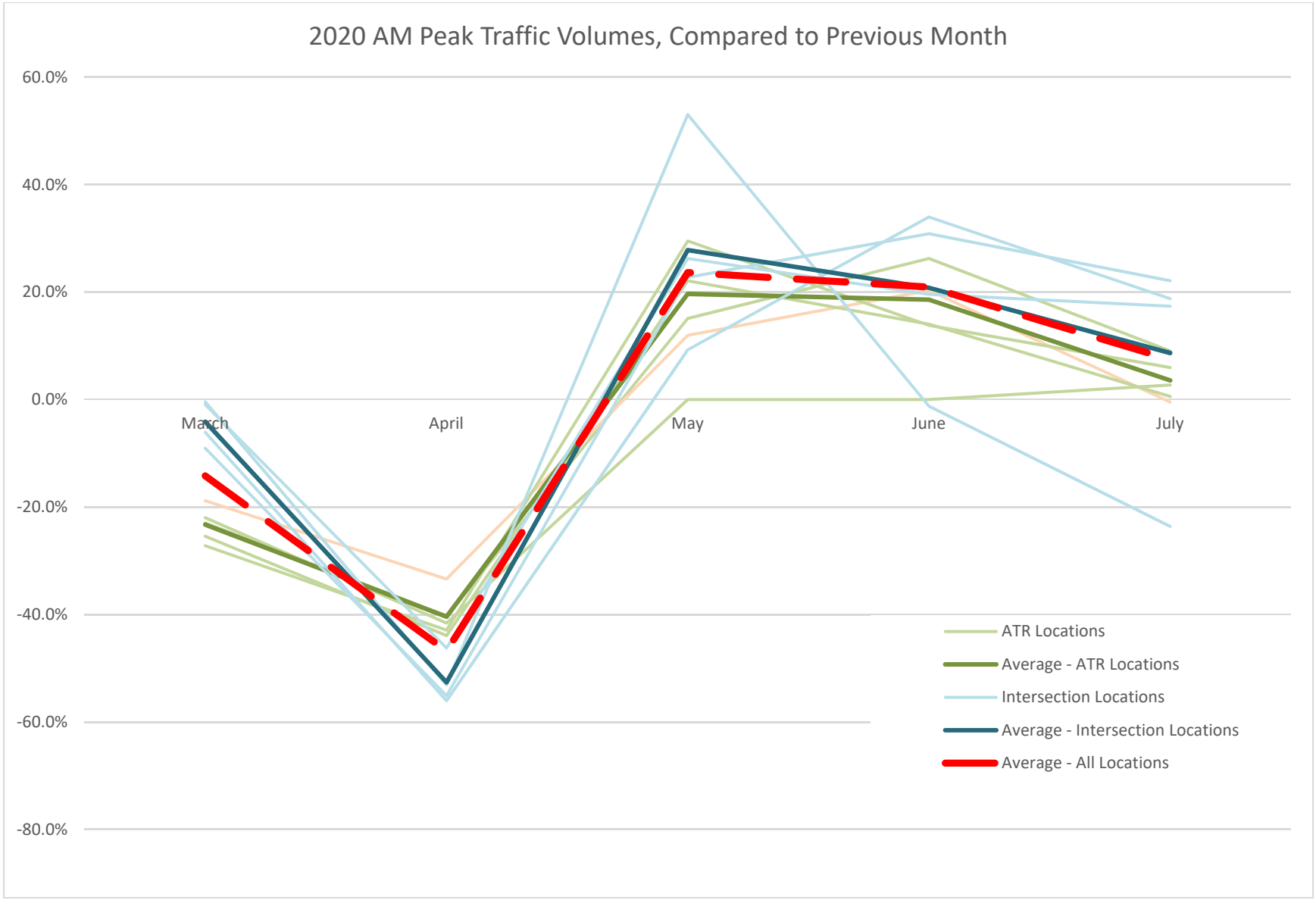
TRAFFIC VOLUME PROJECTIONS

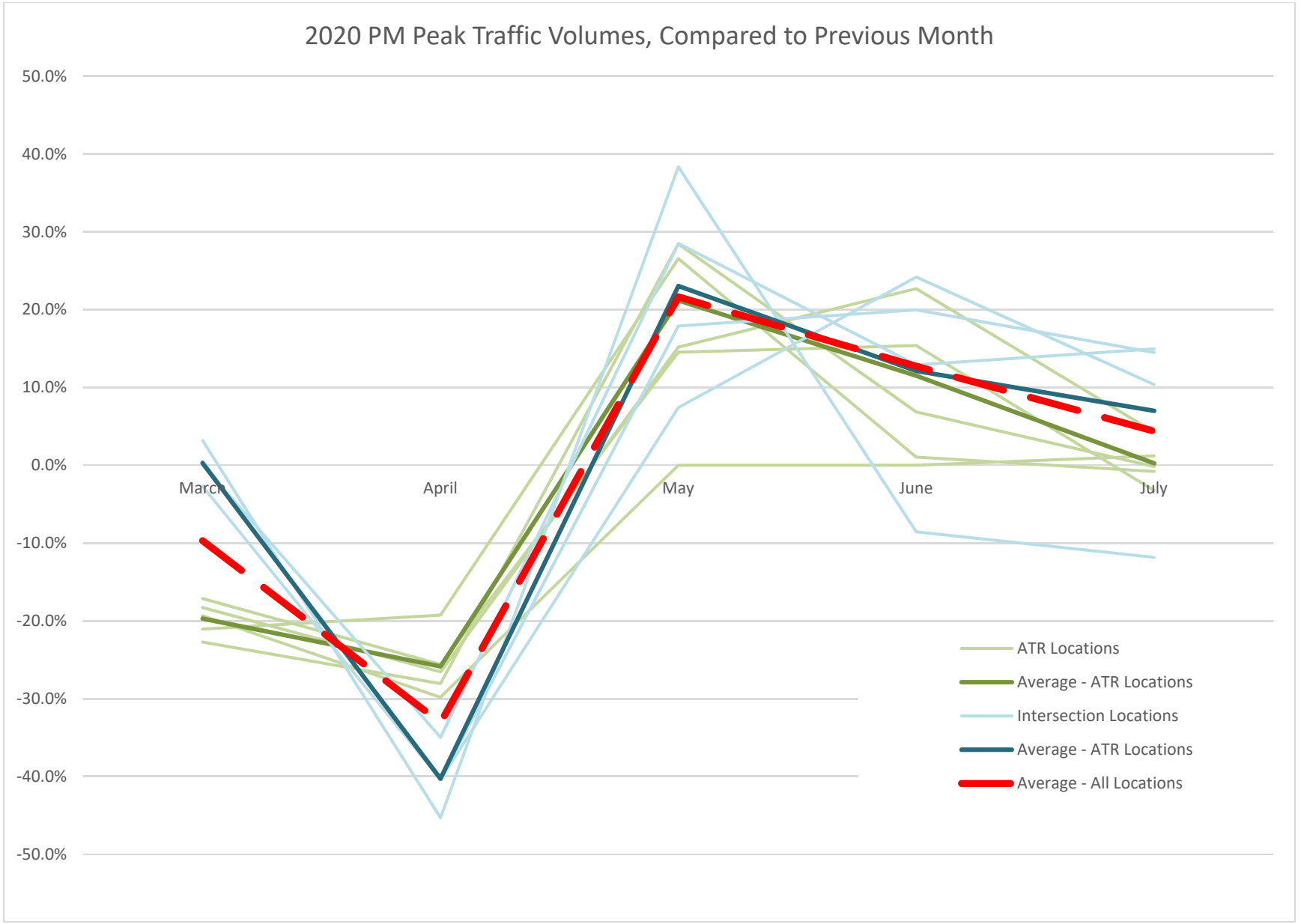
It is unknown what the long-term impacts from the COVID-19 pandemic will be. Professional judgment and thorough documentation of all assumptions will be necessary to support any future traffic volume projections. Coordinate with WisDOT TFS (DOTTrafficForecasting@dot.wi.gov) on the development of future traffic forecasts.

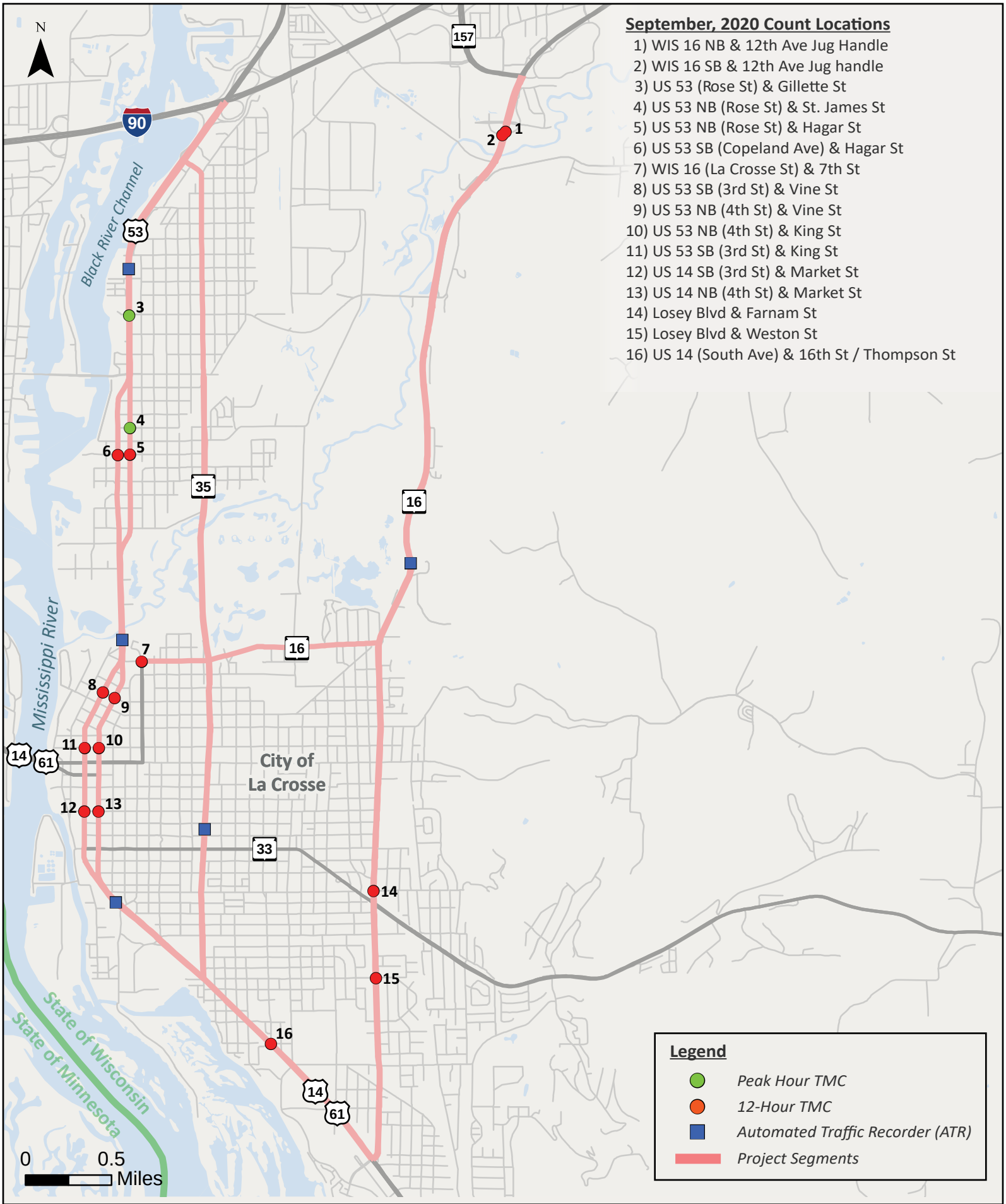
FUTURE EVALUATION

Where possible, projects analyzed under COVID-19 conditions, *should* be reevaluated after traffic conditions reflect the “new” normal and prior to going to construction.

Should you have any questions or require additional information on the COVID-19 Traffic Data Collection Interim Policy, please contact BTO-TASU (DOTTrafficAnalysisModeling@dot.wi.gov).


2020 AM Peak Traffic Volumes, Compared to Previous Month
60.0%
40.0%
20.0%
0.0%
-20.0%
-40.0%
-60.0%
-80.0%
March
April
May
June
July
ATR Locations
Average - ATR Locations
Intersection Locations
Average - Intersection Locations
Average - All Locations


2020 PM Peak Traffic Volumes, Compared to Previous Month
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
-10.0%
-20.0%
-30.0%
-40.0%
-50.0%
March
April
May
June
July
ATR Locations
Average - ATR Locations
Intersection Locations
Average - ATR Locations
Average - All Locations

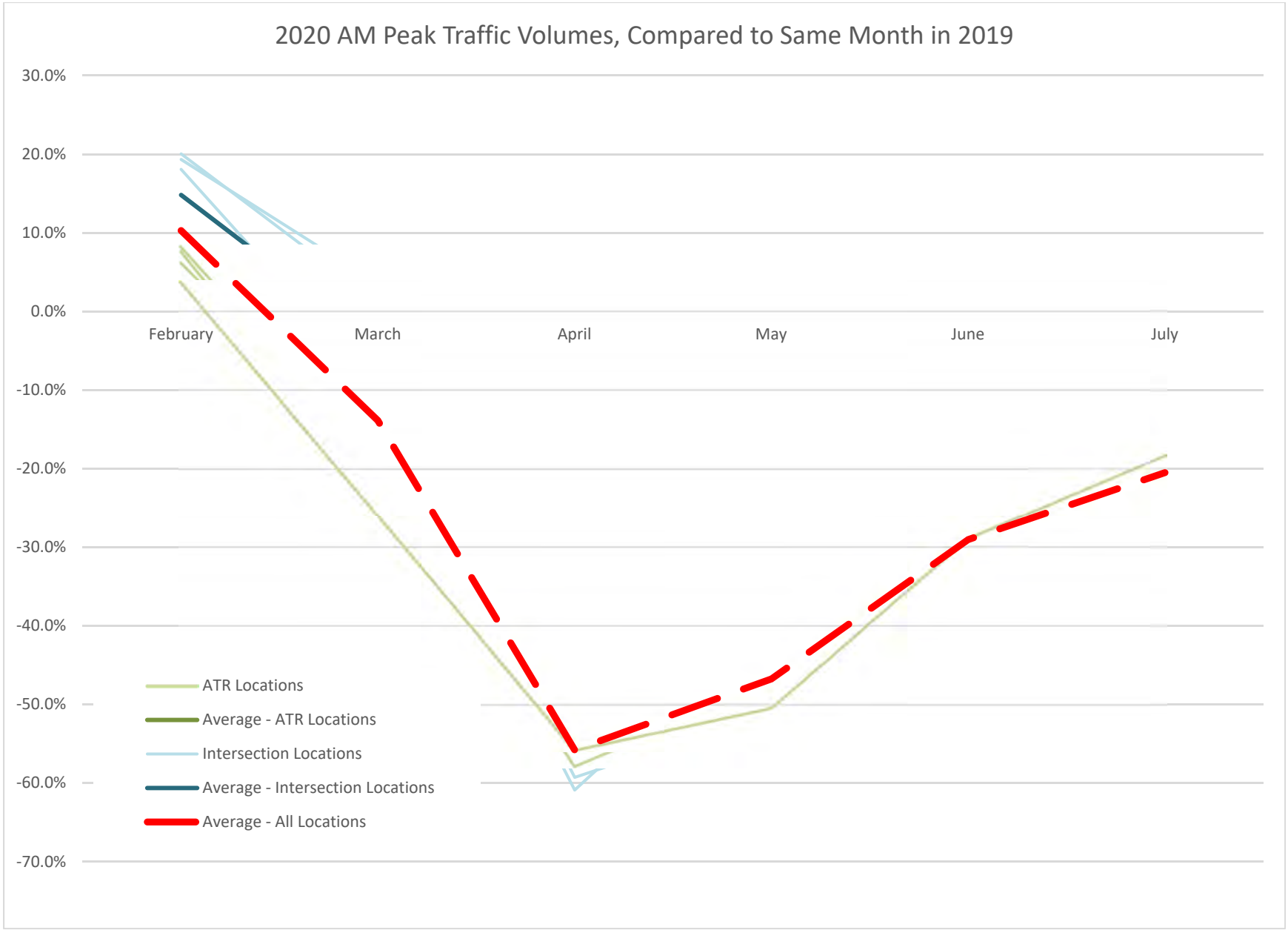


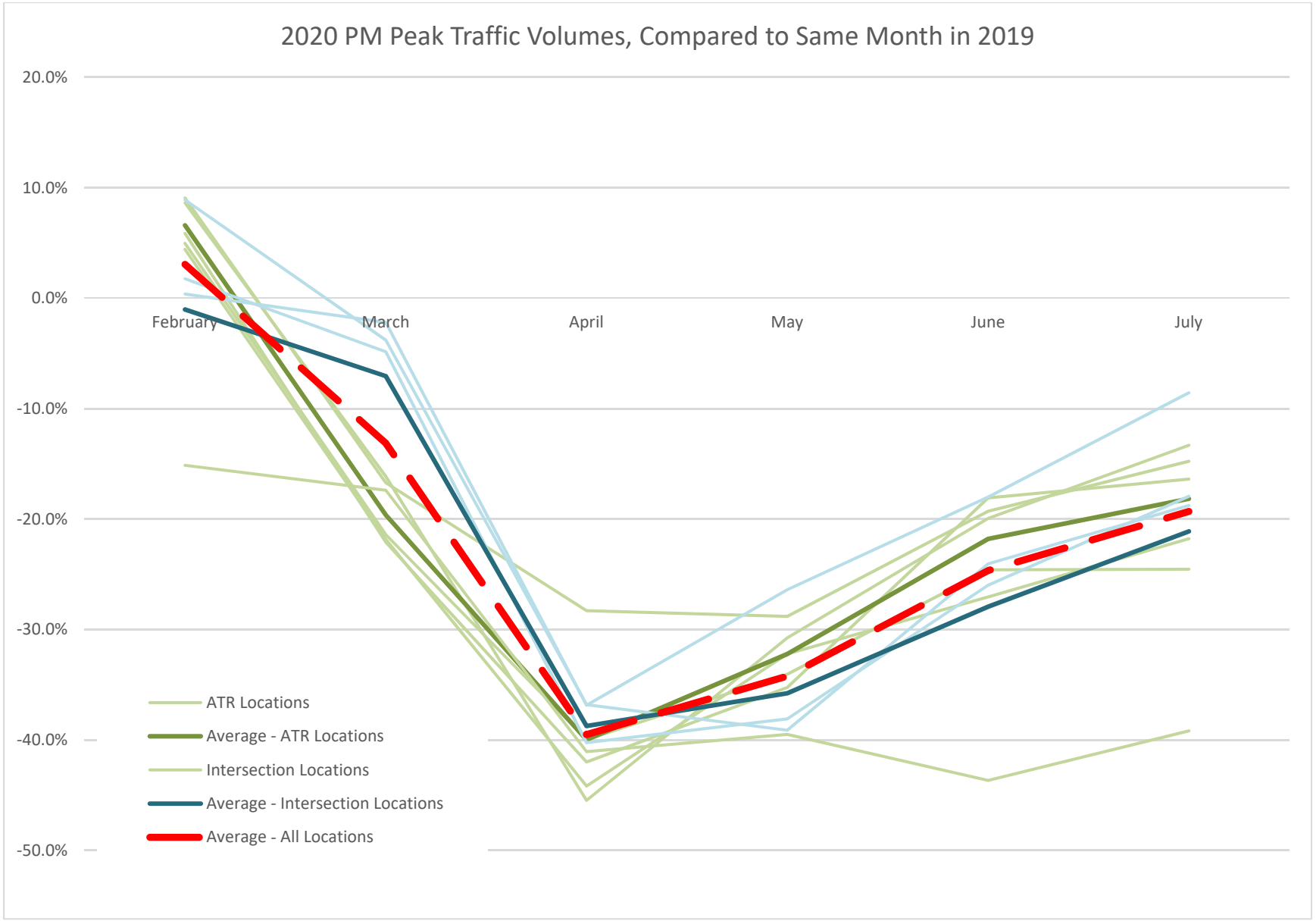
Traffic Count Locations (September, 2020)

La Crosse Safety and Operations Study

December 2021

WisDOT ID: 1630-08-00


2020 AM Peak Traffic Volumes, Compared to Same Month in 2019
30.0%
20.0%
10.0%
0.0%
-10.0%
-20.0%
-30.0%
-40.0%
-50.0%
-60.0%
-70.0%
February
March
April
May
June
July
ATR Locations
Average - ATR Locations
Intersection Locations
Average - Intersection Locations
Average - All Locations

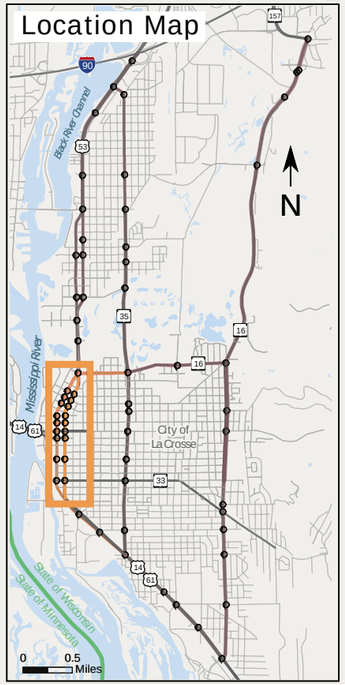

2020 PM Peak Traffic Volumes, Compared to Same Month in 2019
20.0%
10.0%
0.0%
-10.0%
-20.0%
-30.0%
-40.0%
-50.0%
February
March
April
May
June
July
ATR Locations
Average - ATR Locations
Intersection Locations
Average - Intersection Locations
Average - All Locations

Appendix 3: Turning Movement Traffic Volumes

N

Jackson St
Market St
Cameron Ave
Cass St
King St
Jay St
Main St
State St
Vine St
La Crosse St
3rd St
4th St
14
61
53

Location Map



Legend

XXX AM Peak Volume (7:00-8:00 AM)

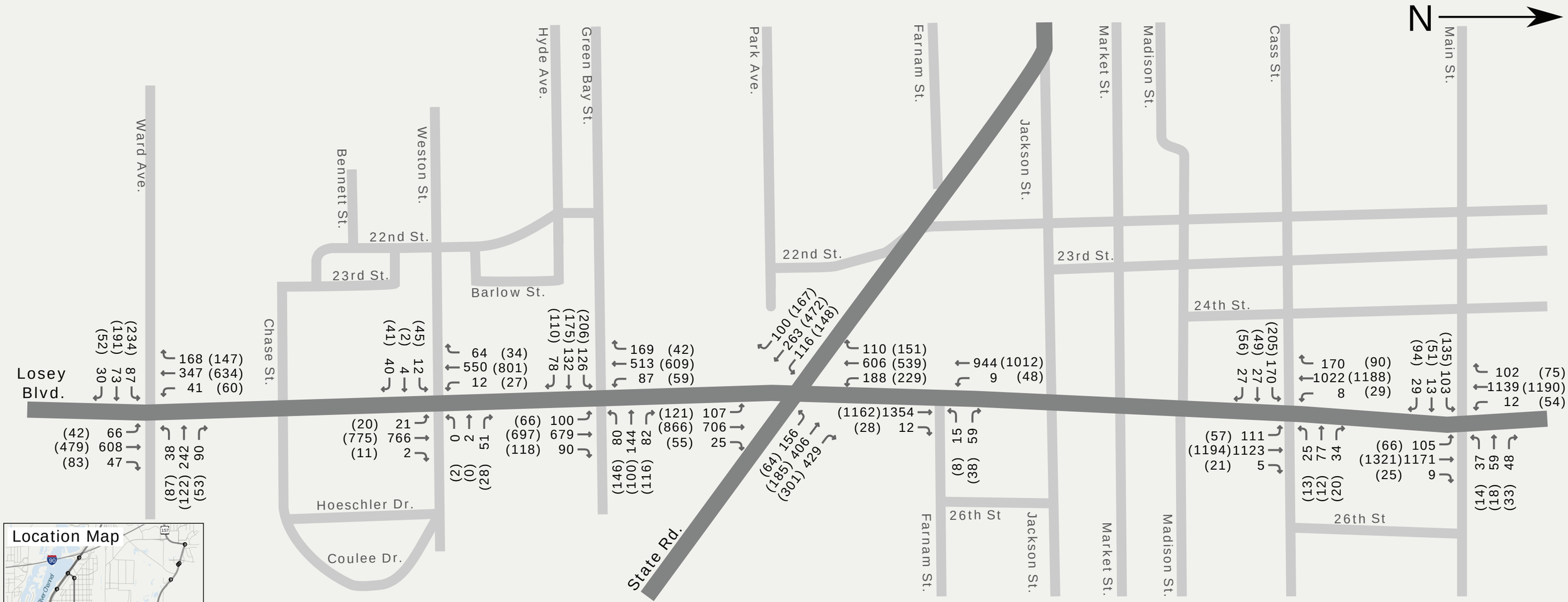
(XXX) PM Peak Volume (4:15-5:15 PM)

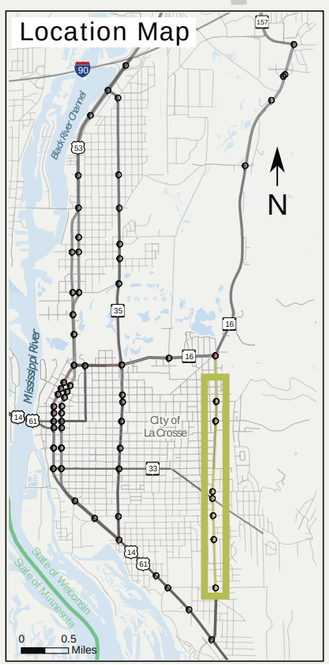
Turning Movement Traffic Volumes
Downtown Segment

La Crosse Safety and Operations Study

December 2021

WisDOT ID: 1630-08-00





Legend

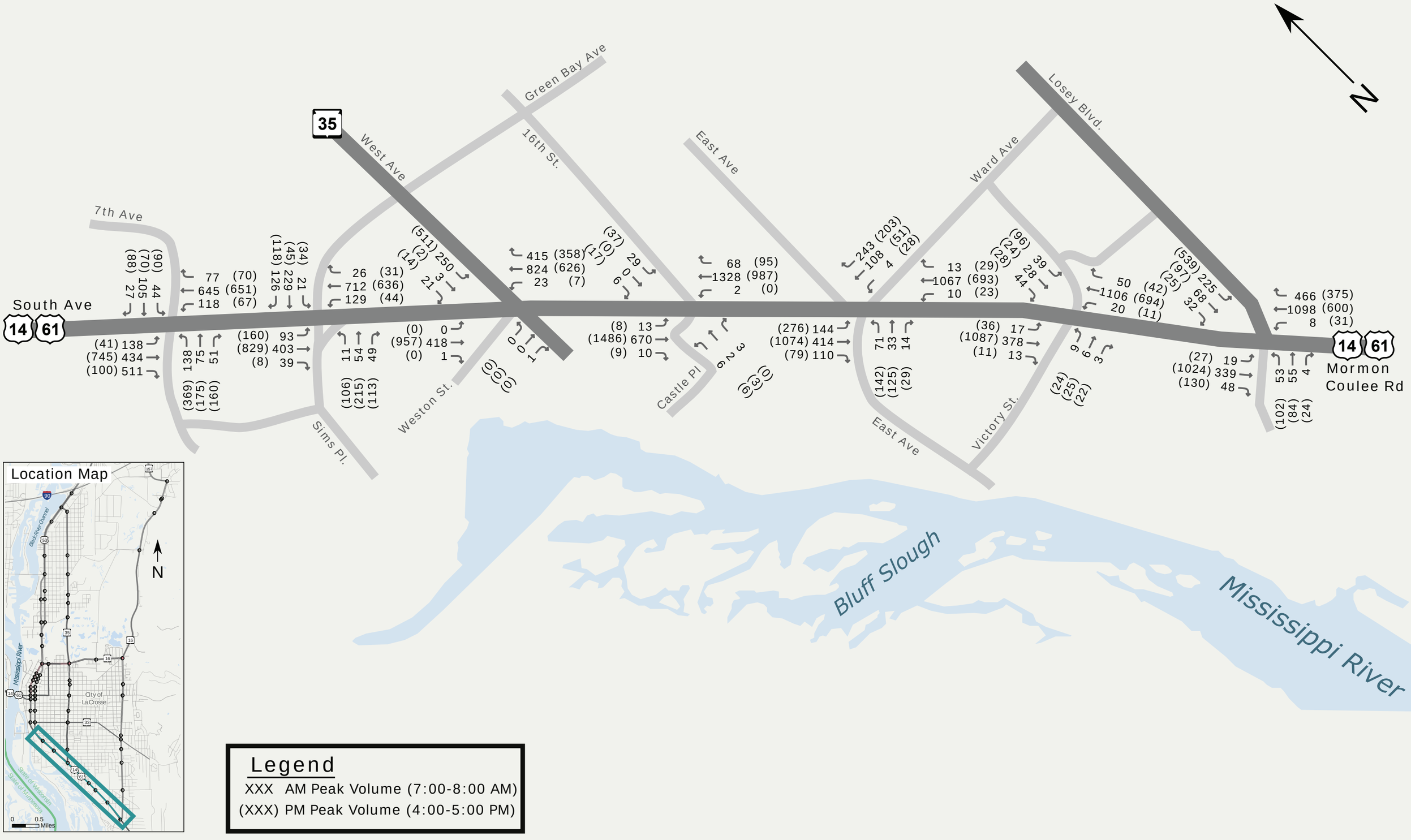
XXX AM Peak Volume (7:00-8:00 AM)

(XXX) PM Peak Volume (3:30-4:30 PM)

Turning Movement Traffic Volumes
Losey Boulevard Segment
La Crosse Safety and Operations Study

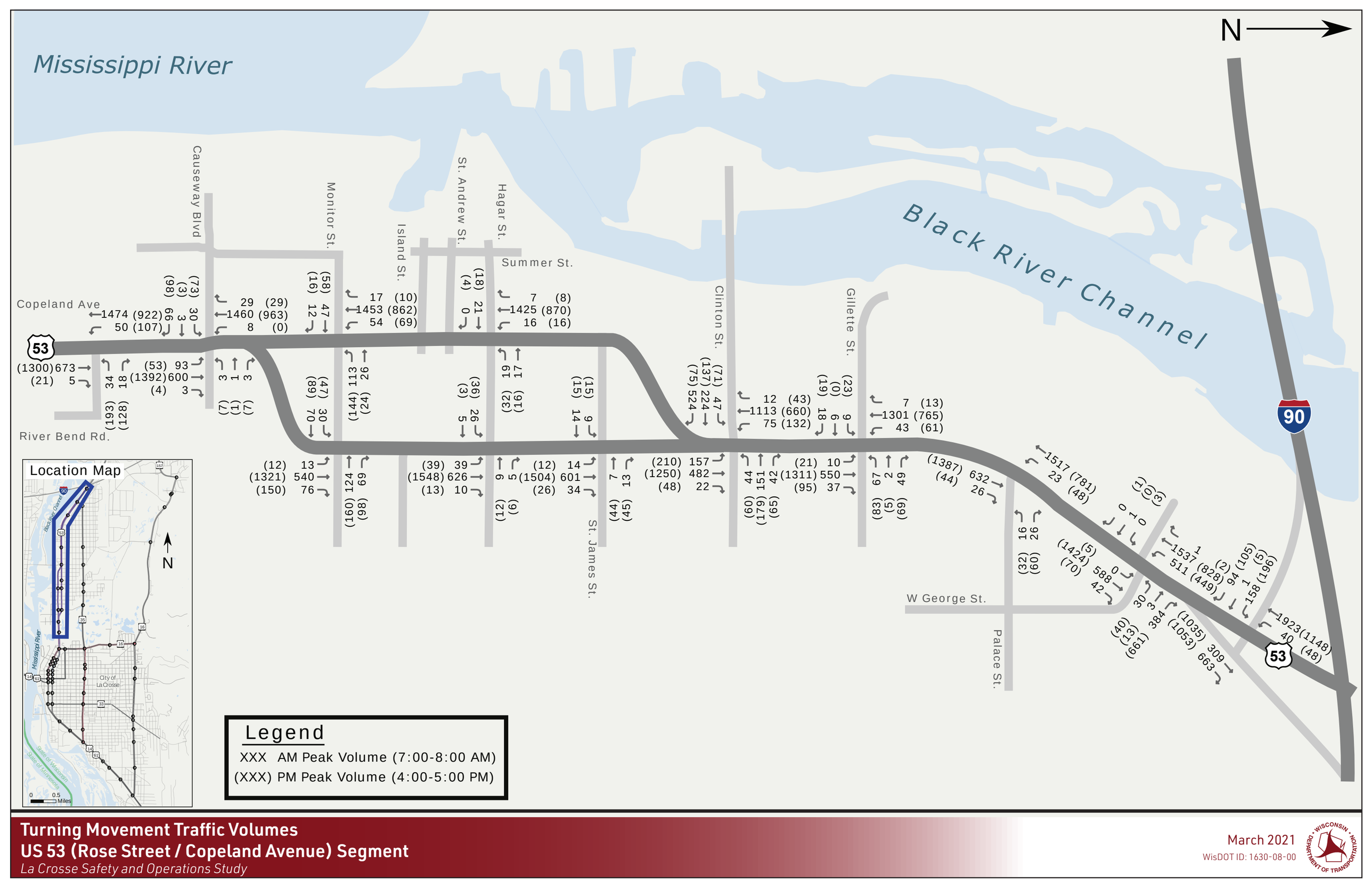
January 2021

WisDOT ID: 1630-08-00



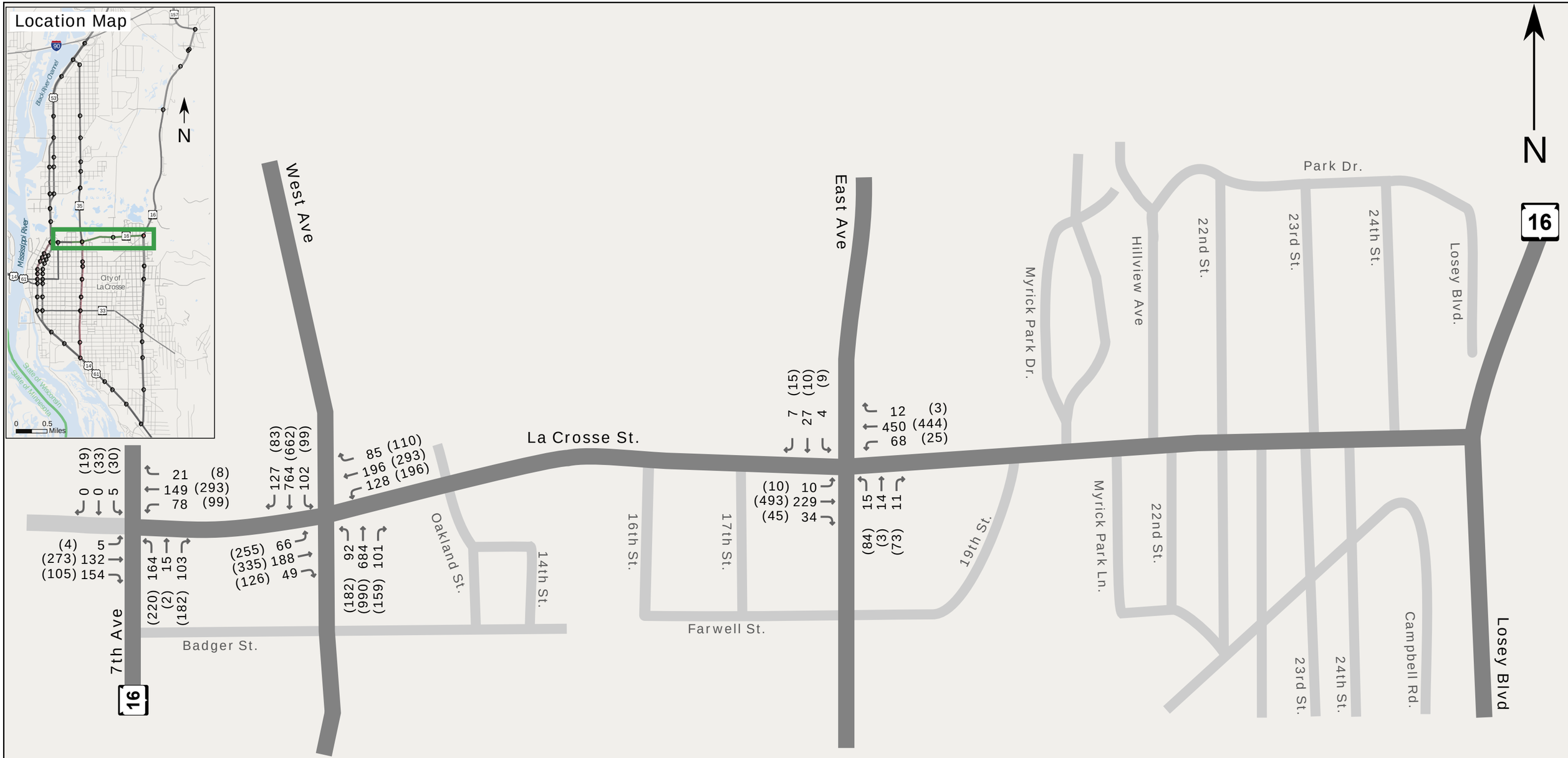
Turning Movement Traffic Volumes
US 14/61 (South Avenue / Mormon Coulee Road) Segment
La Crosse Safety and Operations Study

January 2021
WisDOT ID: 1630-08-00



Turning Movement Traffic Volumes
US 53 (Rose Street / Copeland Avenue) Segment
La Crosse Safety and Operations Study

March 2021
WisDOT ID: 1630-08-00



Legend

XXX AM Peak Volume (7:00-8:00 AM)

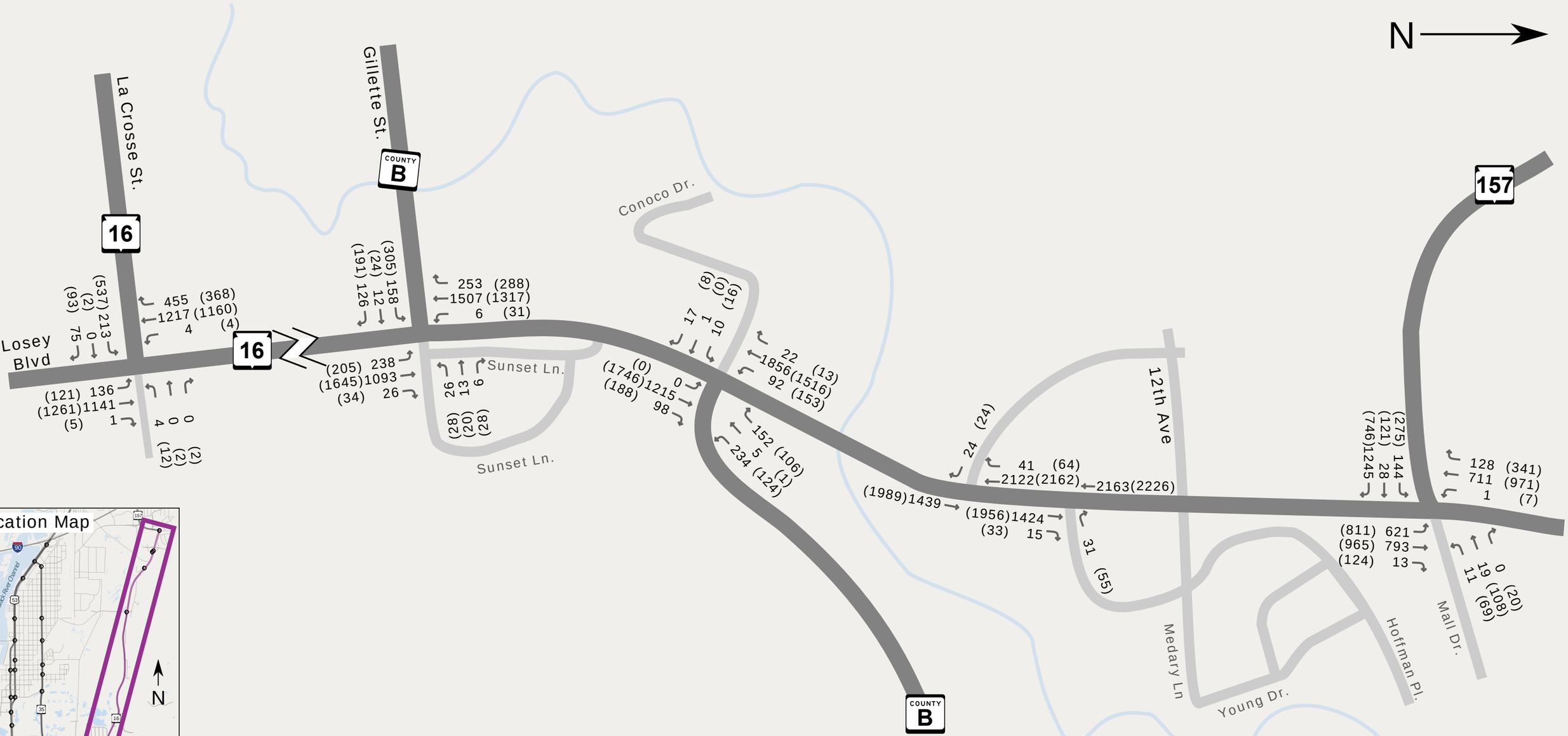
(XXX) PM Peak Volume (4:30-5:30 PM)

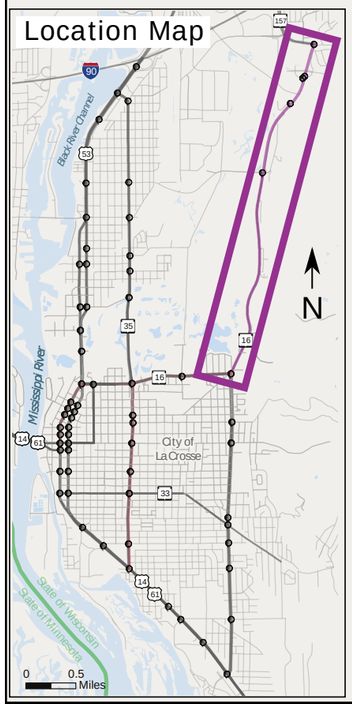
Turning Movement Traffic Volumes
WIS 16 (La Crosse Street) Segment

La Crosse Safety and Operations Study

December 2021

WisDOT ID: 1630-08-00





Legend

XXX AM Peak Volume (7:00-8:00 AM)

(XXX) PM Peak Volume (4:00-5:00 PM)

Turning Movement Traffic Volumes
WIS 16 Segment
La Crosse Safety and Operations Study

December 2021

WisDOT ID: 1630-08-00

N

Monitor St. | Island St. | St. Andrew St. | St. Cloud St. | St. James St. | Wall St. | Windsor St. | Clinton St. | Logan St. | Sill St. | Gillette St. | Rublee St. | North St. | Livingston St. | Moore St. | Hayes St. | Palace St.

Charles St.

Kane St.

George St.

Ranger Dr.

Wood St.

Onalaska Ave.

35

(152) 56 / (122) 64

123 (85) / 978 (742)

(139) 128 / (1185) 699

(30) 22 / (1264) 684 / (42) 27

(49) 44 / (6) 7 / (34) 35

16 (20) / 1055 (769) / 50 (51)

31 5 33 / (47) (7) (54)

(981) 581 / (367) 184

845 (581) / 33 (20)

(268) 289 45 / (42)

(25) 16 / (69) 122 / (152) 196

(223) 132 / (637) 317 / (158) 158

28 (47) / 589 (370) / 1 (2)

95 56 4 / (72) (59) (11)

(45) 44 / (87) 113 / (42) 41

(65) 57 / (593) 280 / (25) 12

42 (28) / 500 (327) / 67 (43)

55 120 63 / (60) (122) (76)

(80) / (14) / (18) 43 13 25

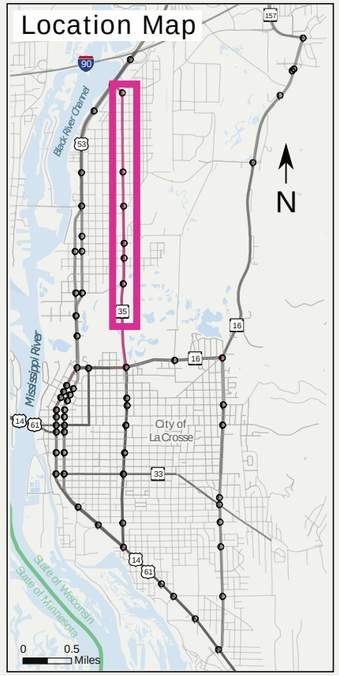
77 (88) / 391 (294) / 86 (130)

(35) 28 / (400) 260 / (64) 76

50 8 8 74 / (76) (19) (60)

George St.

Location Map



Legend

XXX AM Peak Volume (7:00-8:00 AM)

(XXX) PM Peak Volume (4:15-5:15 PM)

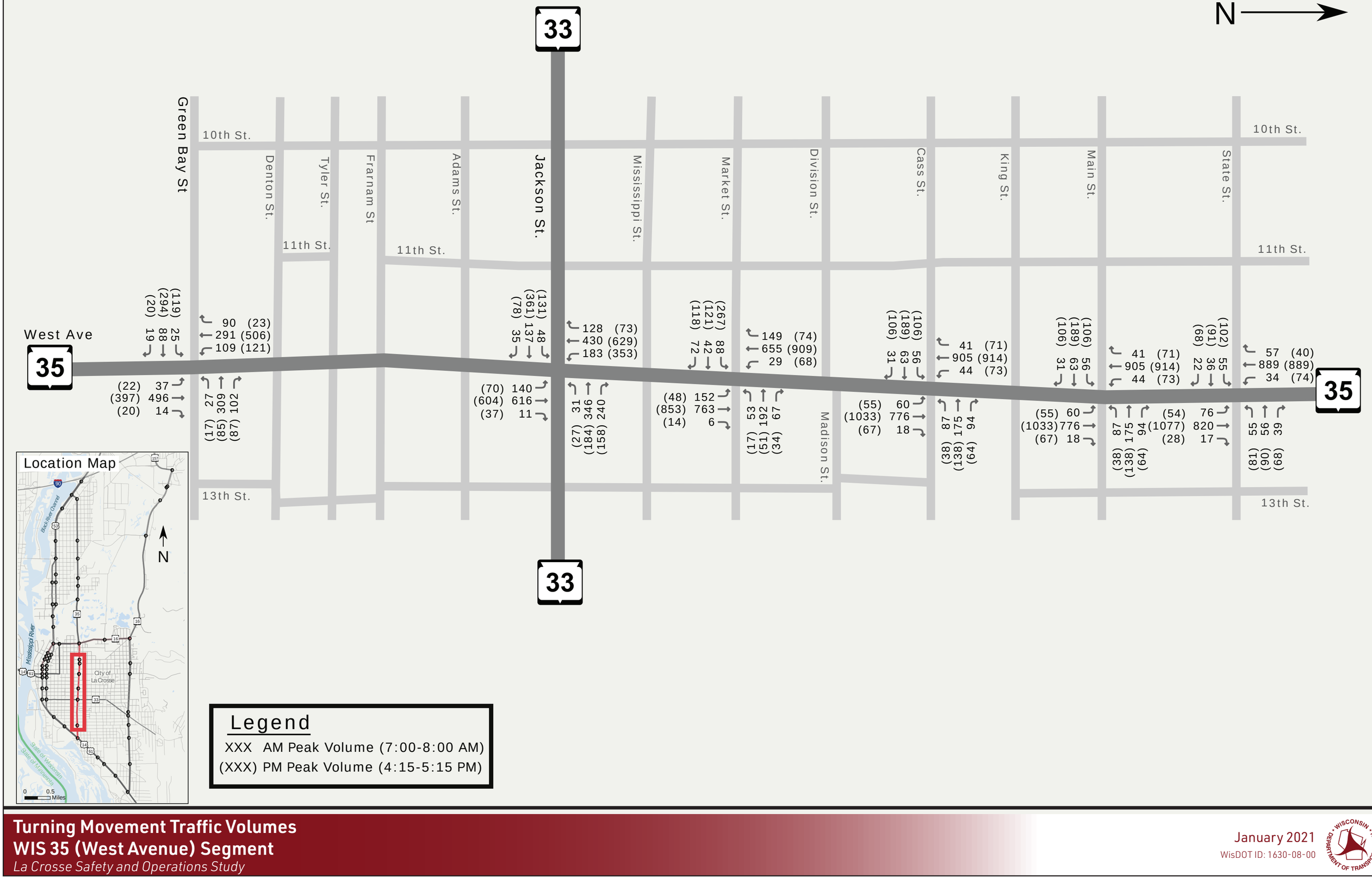
Turning Movement Traffic Volumes
WIS 35 (George Street) Segment

La Crosse Safety and Operations Study

January 2021

WisDOT ID: 1630-08-00

WISCONSIN DEPARTMENT OF TRANSPORTATION



Turning Movement Traffic Volumes
WIS 35 (West Avenue) Segment
La Crosse Safety and Operations Study

January 2021
WisDOT ID: 1630-08-00

Appendix 4: Existing Conditions Traffic Modeling Methodology and Results

AECOM
1350 Deming Way
Middleton, WI 53562
aecom.com

Project name:
La Crosse Safety & Operations Study

Project ref:
1630-08-00

To:
Josh Koebernick, WisDOT
Ruchi Datta, WisDOT

CC:
Rich Cannon, WisDOT
Andy Winga, WisDOT
Michael Hoelker, WisDOT

From:
Jeff Sandberg

Date:
December 8, 2021

Memorandum

Subject: Existing Conditions Traffic Modeling Methodology

AECOM is working with the Wisconsin Department of Transportation (WisDOT) Southwest Region to complete a Safety & Operations Study of major north-south roadways in the City of La Crosse, WI. This study includes development of traffic models to evaluate critical intersections on these project roadways. The purpose of this memo is to document the methodology and results of the Existing Conditions traffic modeling effort.

Project Location

The La Crosse Safety & Operations Study encompasses portions of US 53, WI 35, WI 16, US 14/61, and Losey Blvd. 66 intersections were identified as critical intersections for analysis, including 50 signalized intersections, 12 two-way stop controlled intersections, three roundabout intersections, and one all-way stop controlled intersections. A project location map, which shows project segments and intersections, is attached.

Existing Conditions

This memo documents the existing conditions (2019) traffic modeling effort. "Existing Conditions" is defined as current conditions plus programmed projects. As a result, several intersections were evaluated with updated geometry anticipated to be implemented in future projects. A summary of these intersections includes:

- Project 1641-02-02/72/82 includes the reconstruction of US 14/61 (South Ave) between Ward Ave and Green Bay St. This project includes converting the USH 14/61 intersections with WI 35 (West Ave), 16th St, and Ward Ave to roundabout intersections. This project is scheduled for a 2022 LET.
- Project 7575-07-03/83 includes a reconditioning and TWLTL addition for WIS 16 (La Crosse St) between WIS 35 (West Ave) and Losey Blvd. This project includes lane configuration and geometry changes at the WIS 16 (La Crosse St) intersections with East Ave and Losey Blvd. This project is scheduled for a 2022 LET.
- Project 5120-02-70 includes a reconditioning and road diet for WIS 33 (Jackson St) from US 53 (4th St) to Losey Blvd. While this roadway segment is not included in the study area, its intersection with WIS 35 (West Ave) is included. This project will include changes to lane configuration and geometry at the WIS 33 (Jackson St) & WIS 35 (West Ave) intersection. This project was scheduled for a November, 2020 LET.

Model Development

The existing conditions traffic models include current roadway geometry, traffic control, and signal timing. The process used to develop these traffic models is as follows:

1. Obtain Synchro models from WisDOT that were used in previous planning efforts in the City of La Crosse.
2. Add project intersections that were not included in WisDOT-provided Synchro models.
3. Update the model geometry and traffic control based on a review of aerial mapping, field review, and videos obtained during the field review.
4. Update signal timing parameters based on traffic signal plans and traffic signal timing obtained from WisDOT and the City of La Crosse.
5. Since Synchro is not a WisDOT-approved roundabout analysis model (TEOpS 16-15-20.2.2), HCS models were created for roundabout intersections.

Traffic Volumes

Due to the COVID-19 pandemic, the traffic data collection effort was modified from the original plan to gather new traffic data throughout the project area. Details on the traffic data collection effort are documented in the Traffic Data Collection Plan.

Since this project included the collection of traffic data during the COVID-19 pandemic, traffic count adjustment factors were developed and applied to these traffic volumes so they emulate pre-COVID traffic conditions. The pre-COVID base year chosen for this study is 2019, the most recent year for which traffic data was available for the majority of project intersections. This process is documented in the Traffic Count Adjustment Factors Memo.

With the collection of turning movement traffic counts (TMCs) from a variety of sources, challenges and inconsistencies were discovered. A list of these, including the assumptions and processes used to address them, is below:

1. Peak hours varied widely throughout the project intersections. In an effort to account for this variability while maintaining uniformity with nearby intersections, the peak hours selected at each intersection were selected on a corridor-wide basis. The peak hours for each corridor include:
    a. USH 14/61 (South Ave, Mormon Coulee Rd): 7:00 – 8:00 AM, 4:00 – 5:00 PM
    b. Losey Blvd: 7:00 – 8:00 AM, 3:30 – 4:30 PM
    c. WIS 35 (West Ave) 7:00 – 8:00 AM, 4:00 – 5:00 PM
    d. Downtown: 7:00 – 8:00 AM, 4:15 – 5:15 PM
    e. WIS 16 (La Crosse St): 7:00 – 8:00 AM, 4:30 – 5:30 PM
    f. WIS 16: 7:00 – 8:00 AM, 4:00 – 5:00 PM
    g. WIS 35 (George St): 7:00 – 8:00 AM, 4:15 – 5:15 PM
    h. US 53 (Rose St, Copeland Ave): 7:00 – 8:00 AM, 4:00 – 5:00 PM
2. Heavy vehicle percentages are not available for TMCs obtained from Gridsmart cameras. In these cases, heavy vehicles percentages from nearby intersections were used. If no intersections were nearby. The Synchro default heavy vehicle percentage (2%) was used.
3. The Gridsmart camera at the US 53 (Rose St) & Clinton St intersection was not configured to capture the eastbound right turn volume. The traffic volume for this movement was approximated using 2017 AADT volumes on Clinton Street west of the intersection and turning movement traffic volumes for other movements at the intersection.

4. The TMCs for the US 53 NB (4th St) and US 53 SB (3rd St) intersections with Market Street were completed at a time when Market Street was closed between these two streets. 2014 and 2017 AADT volumes were used to estimate turning movement volumes for the movements not available due to the closure.

5. The three roundabouts on US 14/61 (South Ave), planned for construction as part of project 1641-02-02/72/82, include conversion from a 5-leg or 6-leg intersection to a 4-leg roundabout. Traffic volumes on all legs were redistributed to approximate the volumes of a 4-legged intersection.

6. The TMC for the US 53 (4th St) & La Crosse St intersection were completed at a time when a roadway closure significantly reduced the traffic volumes on the west leg of the intersection. To account for this discrepancy, a 2015 PM peak TMC was used to estimate PM peak turning movements to/from the west leg. Unfortunately, the 2015 TMC didn't include the AM peak, so the 2015 PM peak TMC was used to estimate AM peak volumes to/from the west leg for complementary movements. A new TMC will be completed at this intersection in late summer of 2021 to re-assess the traffic analysis results.

7. The Gridsmart TMC for the WIS 16 & WIS 157 intersection was over-counting through volumes on WIS 16 during the April, 2019 timeframe. A review of historical Gridsmart volumes indicates this issue was fixed in the September, 2019 timeframe. As a result, October, 2019 Gridsmart volumes were used at this intersection.

The turning movement traffic volumes used in the traffic modeling effort are attached.

TEOpS Conformance

All traffic models were developed to be in conformance with TEOpS 16-15. Specific methods used to ensure this conformance are as follows:

1. Right Turn on Red (RTOR) adjustments were made using the growth factor method in all cases except one. The one case where the growth adjustment factor could not be used (due to Synchro not accepting growth factors less than 0.5) is the eastbound right turn movement at the US 53 & I-90 EB Off Ramp intersection. The right turn volume for this movement was adjusted manually using a 0.34 adjustment factor.

2. Saturation flow rates (sat flow) were determined using the WisDOT Sat Flow Spreadsheet for all through and through/right turn lanes. Per guidance in TEOpS 16-15-5.2.2.1, a sat flow rate of 1,750 pc/hr/ln was considered the base sat flow rate and was used for left turn lanes and right turn lanes.

3. Headway values for roundabout analysis were selected from TEOpS 16-15, Table 20.1.

HCM6 Results in Synchro

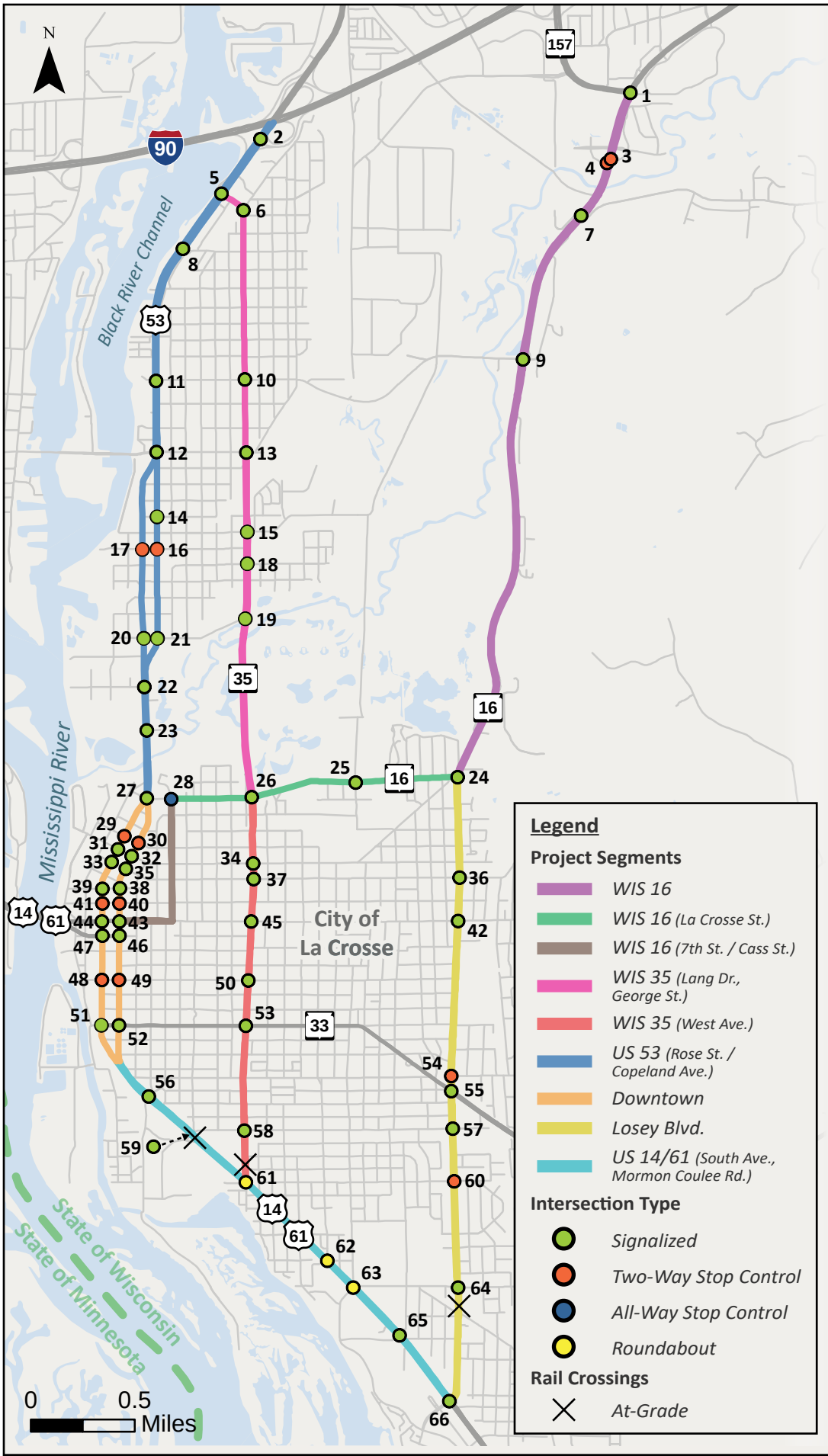
The goal for the traffic modeling effort was to provide HCM6 operational outputs at all intersections. The HCM6 module in Synchro requires operational parameters to be input in a specific format. Any deviation from that format will result in the inability to report HCM6 results. Several issues were discovered that prevented the Synchro models from reporting HCM6 results. A summary of these issues and the methods used to address them are as follows:

1. The phasing scheme in the Synchro HCM6 module must follow NEMA phasing. Several intersections have side road split phasing schemes where phases 3 and 4 are used for the side road approaches instead of phases 4 and 8. In these situations, the phasing scheme was changed so the side road approaches use phases 4 and 8. Intersections where this change was made include:
    a. WIS 16 (La Crosse St) & East Ave
    b. US 53 & WIS 35 (George St)
    c. WIS 35 (Lang Dr) & Clinton St / Ranger Rd
    d. WIS 16 & County B / Conoco Rd
    e. WIS 16 & Gillette St / Sunset Ln
    f. WIS 16 (La Crosse St) & Losey Blvd
    g. US 14/61 (Mormon Coulee Rd) & Losey Blvd

2. Several intersections within coordinated signal systems have pedestrian intervals that exceed the assigned split for that phase. In practice, these signals will fall out of coordination when these pedestrian intervals are called and the signal will have to adjust to re-attain coordination. The Synchro HCM6 module will not allow these outsized pedestrian intervals. In these situations, the pedestrian intervals were turned off to remove this conflict. Intersections where this change was made include:
    a. WIS 35 & George St
    b. WIS 16 & Gillette St / Sunset Ln
    c. US 53 (Rose St) & Palace St
    d. US 53 & Clinton St
    e. US 14/61 (Mormon Coulee Rd) & Losey Blvd
3. Several intersections have side road approaches that include one left turn lane and one shared through/left turn lane. This lane arrangement is not explicitly supported by the Synchro HCM6 module. Synchro offers an algorithm to redistribute traffic volumes in these lanes so that the HCM6 module can produce results. This algorithm was applied at the following intersections:
    a. WIS 35 (Lang Dr) & St Cloud St
    b. WIS 16 & County B / Conoco Rd
    c. WIS 16 & Gillette St / Sunset Ln
    d. US 14/61 (Mormon Coulee Rd) & Losey Blvd
4. The Synchro HCM6 module tends to overestimate delay for side road approaches that include shared through/left turn lanes and permitted left turn phasing. For intersections with these conditions, Synchro model results are reported instead of Synchro HCM6 results. Intersections with this reporting method include:
    a. WIS 35 & George St
    b. US 53 (Rose St) & Gillette St
    c. US 53 (Copeland Ave) & Causeway Blvd
    d. US 14/61 (Mormon Coulee Rd) & Victory St / 21st Pl
5. The Synchro HCM6 module does not report results for intersection approaches that don't have a through lane when the intersection includes two one-way streets. This condition exists at the US 14/61 NB (4th St) & Cameron Ave intersection. Synchro model results are reported at this intersection instead of Synchro HCM6 results.

Traffic Model Reports

Traffic model reports, sorted by intersection number, are attached.



Project Intersections

1) WIS 16 & WIS 157
2) US 53 & I-94 EB On Ramp
3) WIS 16 NB & 12th Ave Jug Handle
4) WIS 16 SB & 12th Ave Jug handle
5) US 53 (Rose St) & WIS 35
6) WIS 35 & George St
7) WIS 16 & County B
8) US 53 (Rose St) & Palace St
9) WIS 16 & Gillette St
10) WIS 35 (George St) & Gillette St
11) US 53 (Rose St) & Gillette St
12) US 53 (Rose St) & Clinton St
13) WIS 35 (George St) & Clinton St
14) US 53 NB (Rose St) & St. James St
15) WIS 35 (George St) & St Cloud St
16) US 53 NB (Rose St) & Hagar St
17) US 53 SB (Copeland Ave) & Hagar St
18) WIS 35 & St. Andrews St
19) WIS 35 (West Ave) & Monitor St
20) US 53 SB (Copeland Ave) & Monitor St
21) US 53 NB (Rose St) & Monitor St
22) US 53 (Copeland Ave) & Causeway Blvd
23) US 53 (Copeland Ave) & River Bend Dr
24) WIS 16 (La Crosse St) & Losey Blvd
25) WIS 16 (La Crosse St) & East Ave
26) WIS 35 (West Ave) & WIS 16 (La Crosse St)
27) US 53 (Copeland Ave) & La Crosse St
28) WIS 16 (La Crosse St) & 7th St
29) US 53 SB (3rd St) & Vine St
30) US 53 NB (4th St) & Vine St
31) US 53 SB (3rd St) & State St
32) US 53 NB (4th St) & State St
33) US 53 SB (3rd St) & Main St
34) WIS 35 (West Ave) & State St
35) US 53 NB (4th St) & Main St
36) Losey Blvd & Main St
37) WIS 35 (West Ave) & Main St
38) US 53 (4th St) & Jay St
39) US 53 (3rd St) & Jay St
40) US 53 NB (4th St) & King St
41) US 53 SB (3rd St) & King St
42) Losey Blvd & Cass St
43) US 53 NB (4th St) & US 14 WB (Cass St)
44) US 53 SB (3rd St) & US 14 WB (Cass St)
45) WIS 35 (West Ave) & Cass St
46) US 53 NB (4th St) & US 14 EB (Cameron Ave)
47) US 53 SB (3rd St) & US 14 EB (Cameron Ave)
48) US 14 SB (3rd St) & Market St
49) US 14 NB (4th St) & Market St
50) WIS 35 (West Ave) & Market St
51) US 14 SB (3rd St) & WIS 33 (Jackson St)
52) US 14 NB (4th St) & WIS 33 (Jackson St)
53) WIS 35 (West Ave) & WIS 33 (Jackson St)
54) Losey Blvd & Farnam St
55) WIS 33 (State Rd) & Losey Blvd
56) US 14 (South Ave) & 7th St
57) Losey Blvd & Green Bay St.
58) WIS 35 (West Ave) & Green Bay St
59) US 14 (South Ave) & Green Bay St
60) Losey Blvd & Weston St
61) US 14 (South Ave) & WIS 35 (West Ave)
62) US 14 (South Ave) & 16th St / Thompson St
63) US 14 (South Ave) & Ward Ave
64) Losey Blvd & Ward Ave
65) US 14 & 21st St / Victory St
66) US 14 (Mormon Coulee Rd) & Losey Blvd

Project Location Map

La Crosse Safety and Operations Study

December 2021

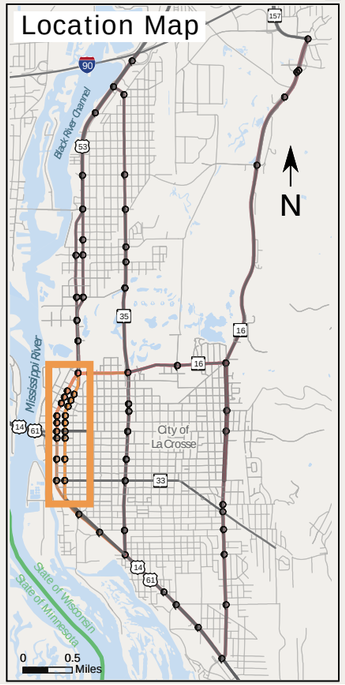
WisDOT ID: 1630-08-00

WISCONSIN DEPARTMENT OF TRANSPORTATION

N

Jackson St
Market St
Cameron Ave
Cass St
King St
Jay St
Main St
State St
Vine St
La Crosse St
3rd St
4th St
14
61
53

Location Map



Legend

XXX AM Peak Volume (7:00-8:00 AM)

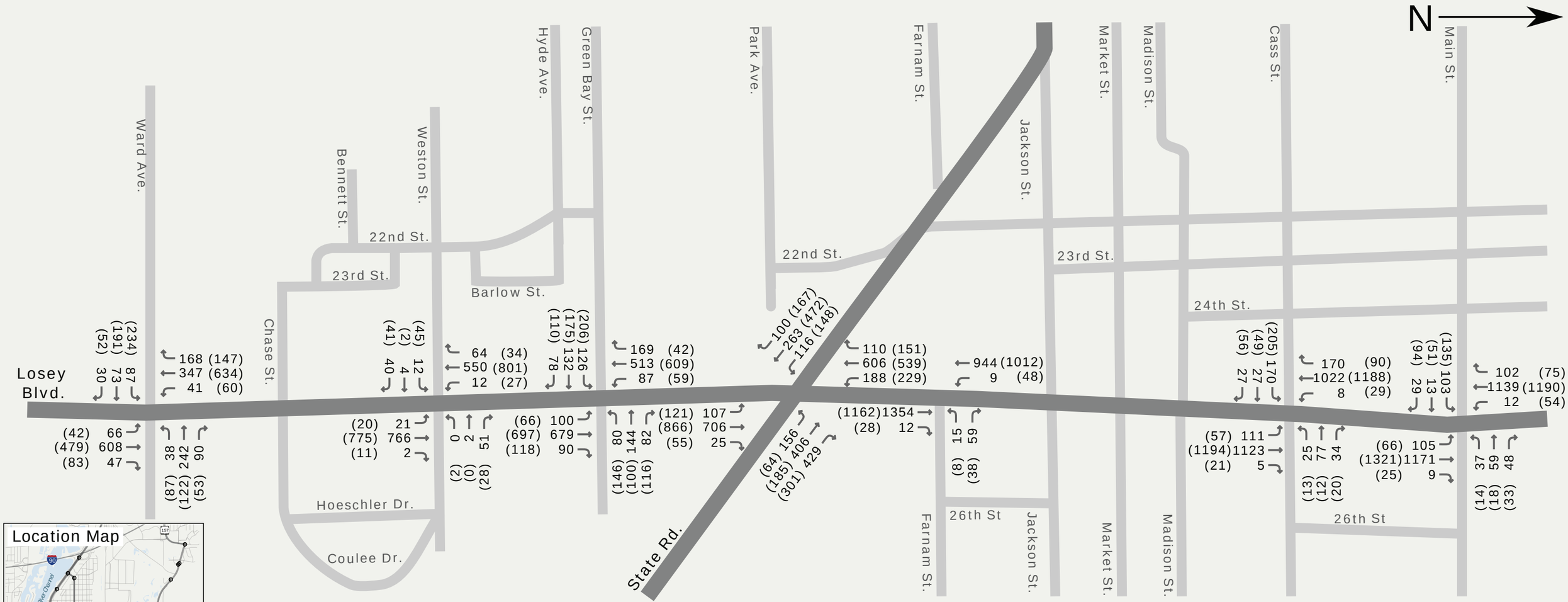
(XXX) PM Peak Volume (4:15-5:15 PM)

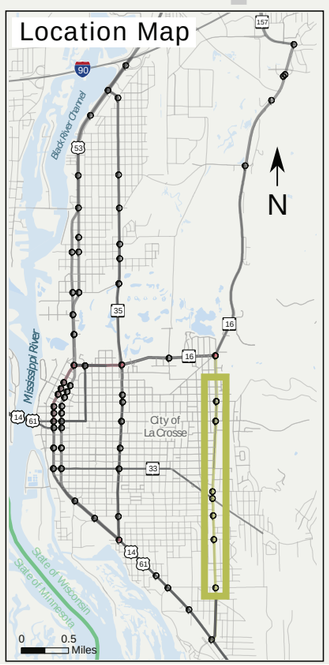
Turning Movement Traffic Volumes
Downtown Segment

La Crosse Safety and Operations Study

December 2021

WisDOT ID: 1630-08-00





Legend

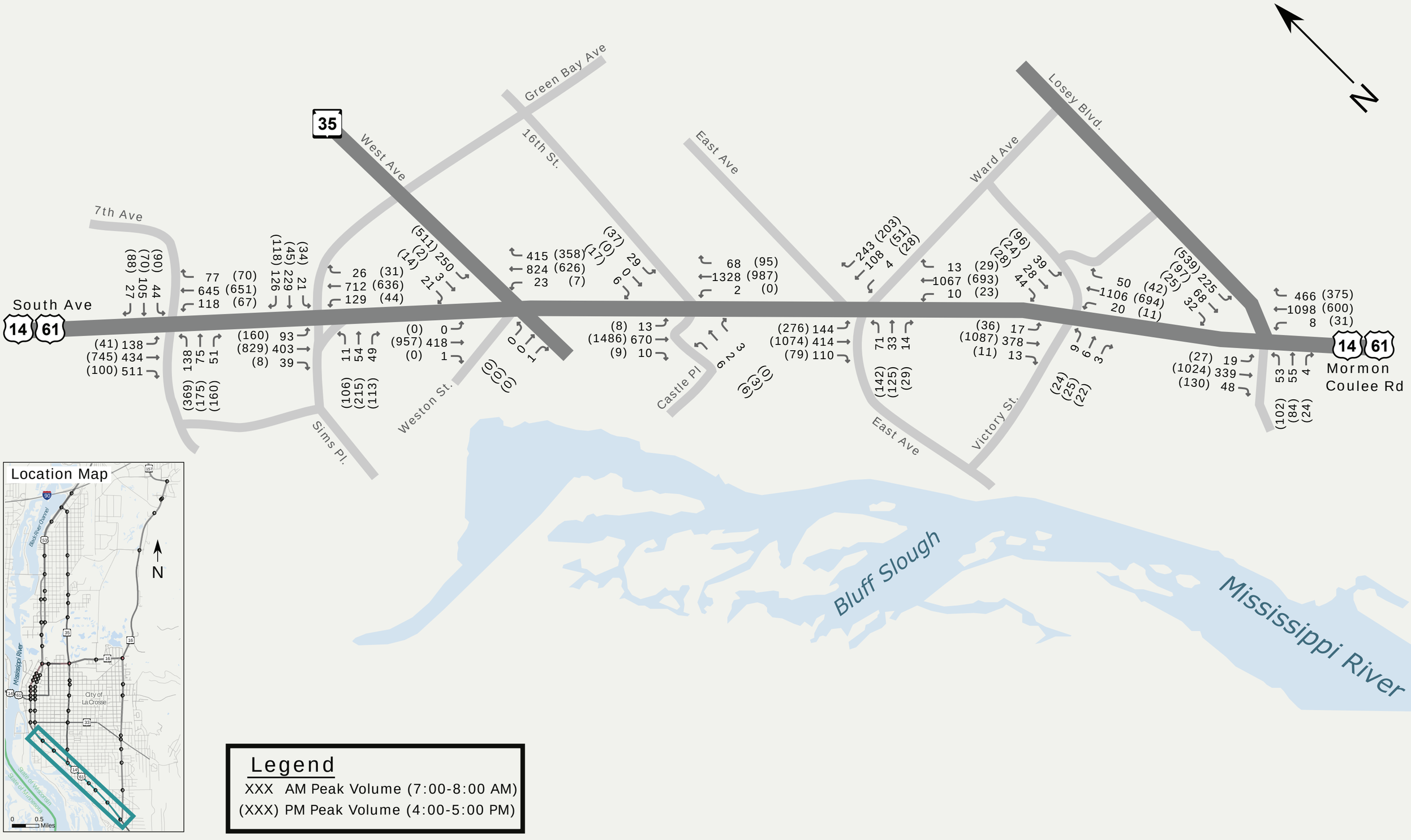
XXX AM Peak Volume (7:00-8:00 AM)

(XXX) PM Peak Volume (3:30-4:30 PM)

Turning Movement Traffic Volumes
Losey Boulevard Segment
La Crosse Safety and Operations Study

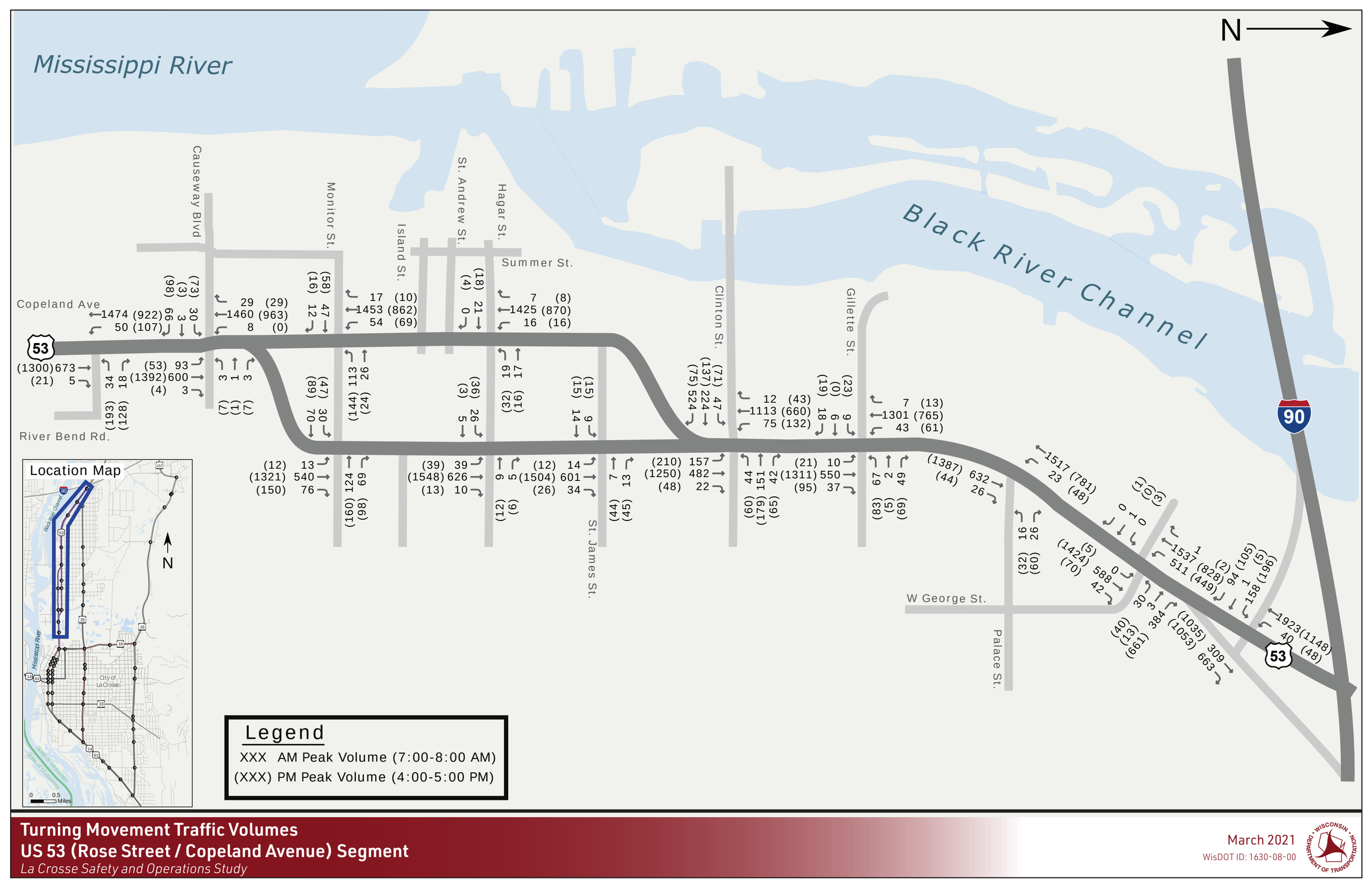
January 2021

WisDOT ID: 1630-08-00



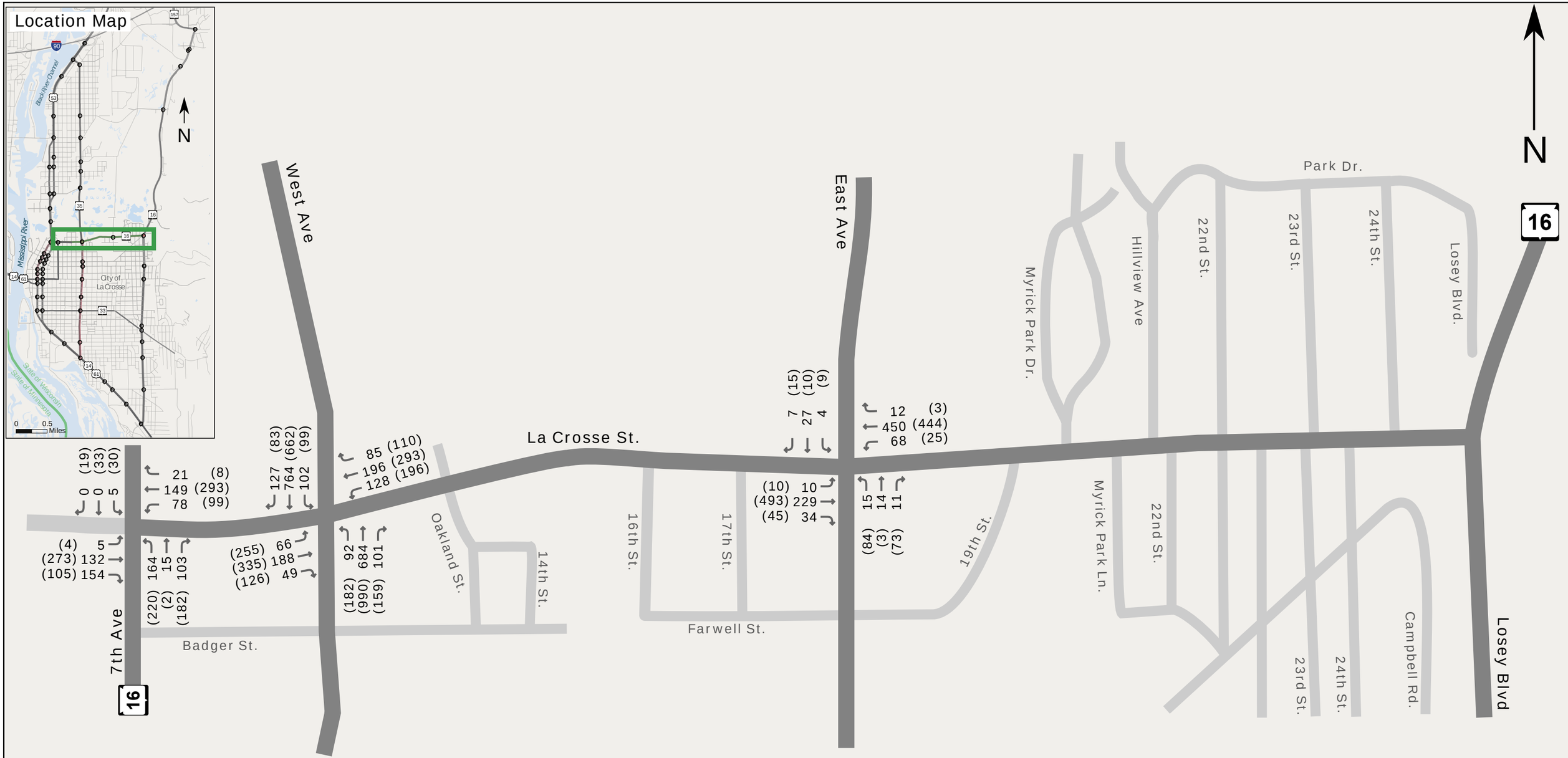
Turning Movement Traffic Volumes
US 14/61 (South Avenue / Mormon Coulee Road) Segment
La Crosse Safety and Operations Study

January 2021
WisDOT ID: 1630-08-00



Turning Movement Traffic Volumes
US 53 (Rose Street / Copeland Avenue) Segment
La Crosse Safety and Operations Study

March 2021
WisDOT ID: 1630-08-00



Legend

XXX AM Peak Volume (7:00-8:00 AM)

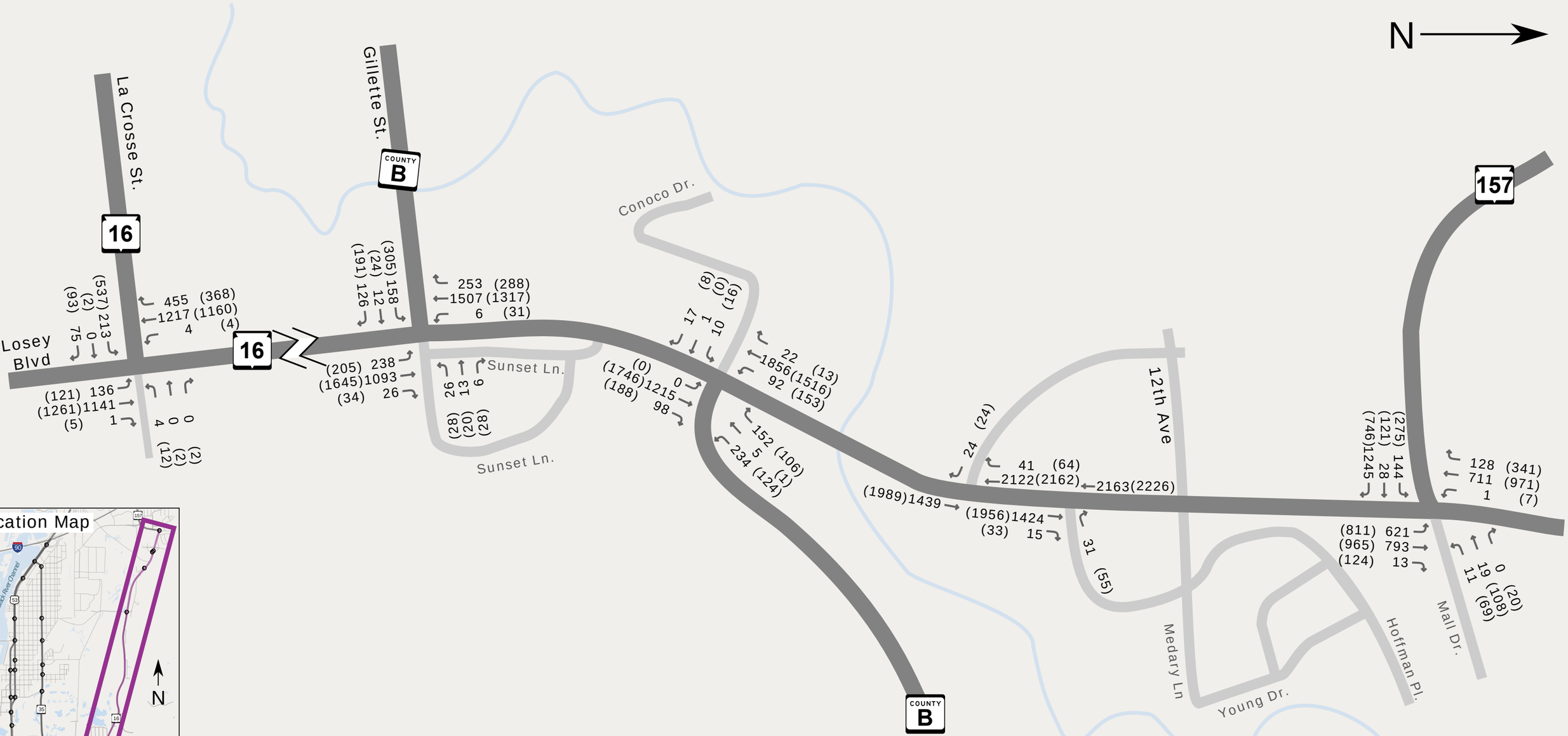
(XXX) PM Peak Volume (4:30-5:30 PM)

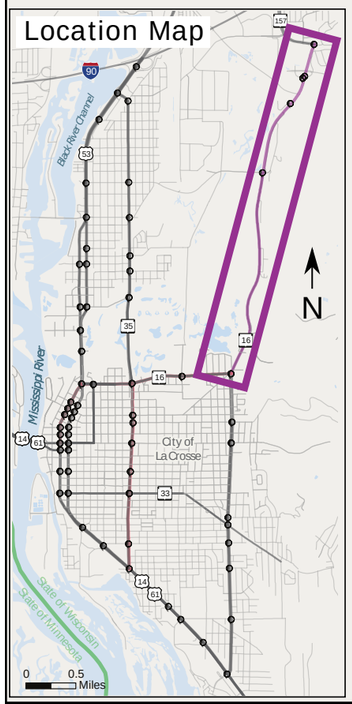
Turning Movement Traffic Volumes
WIS 16 (La Crosse Street) Segment

La Crosse Safety and Operations Study

December 2021

WisDOT ID: 1630-08-00





Legend

XXX AM Peak Volume (7:00-8:00 AM)

(XXX) PM Peak Volume (4:00-5:00 PM)

Turning Movement Traffic Volumes
WIS 16 Segment
La Crosse Safety and Operations Study

December 2021

WisDOT ID: 1630-08-00

N

Monitor St. | Island St. | St. Andrew St. | St. Cloud St. | St. James St. | Wall St. | Windsor St. | Clinton St. | Logan St. | Sill St. | Gillette St. | Rublee St. | North St. | Livingston St. | Moore St. | Hayes St. | Palace St.

Charles St.

Kane St.

George St.

Ranger Dr.

Wood St.

Onalaska Ave.

35

(152) 56 / (122) 64

123 (85) / 978 (742)

(139) 128 / (1185) 699

(30) 22 / (1264) 684 / (42) 27

(49) 44 / (6) 7 / (34) 35

16 (20) / 1055 (769) / 50 (51)

31 5 33 / (47) (7) (54)

(981) 581 / (367) 184

845 (581) / 33 (20)

(268) 289 45 / (42)

(25) 16 / (69) 122 / (152) 196

(223) 132 / (637) 317 / (158) 158

28 (47) / 589 (370) / 1 (2)

95 56 4 / (72) (59) (11)

(45) 44 / (87) 113 / (42) 41

(65) 57 / (593) 280 / (25) 12

42 (28) / 500 (327) / 67 (43)

55 120 63 / (60) (122) (76)

(80) / (14) / (18) 43 13 25

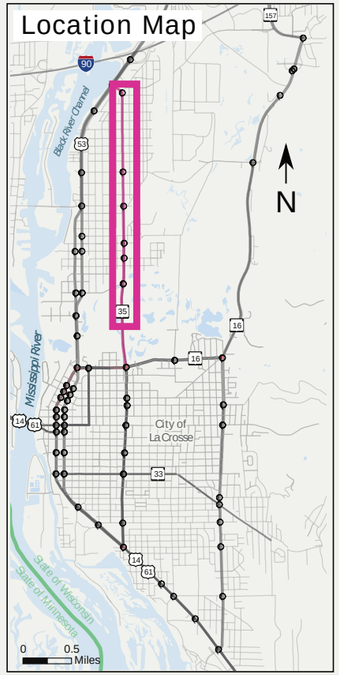
77 (88) / 391 (294) / 86 (130)

(35) 28 / (400) 260 / (64) 76

50 8 8 74 / (76) (19) (60)

George St.

Location Map



Legend

XXX AM Peak Volume (7:00-8:00 AM)

(XXX) PM Peak Volume (4:15-5:15 PM)

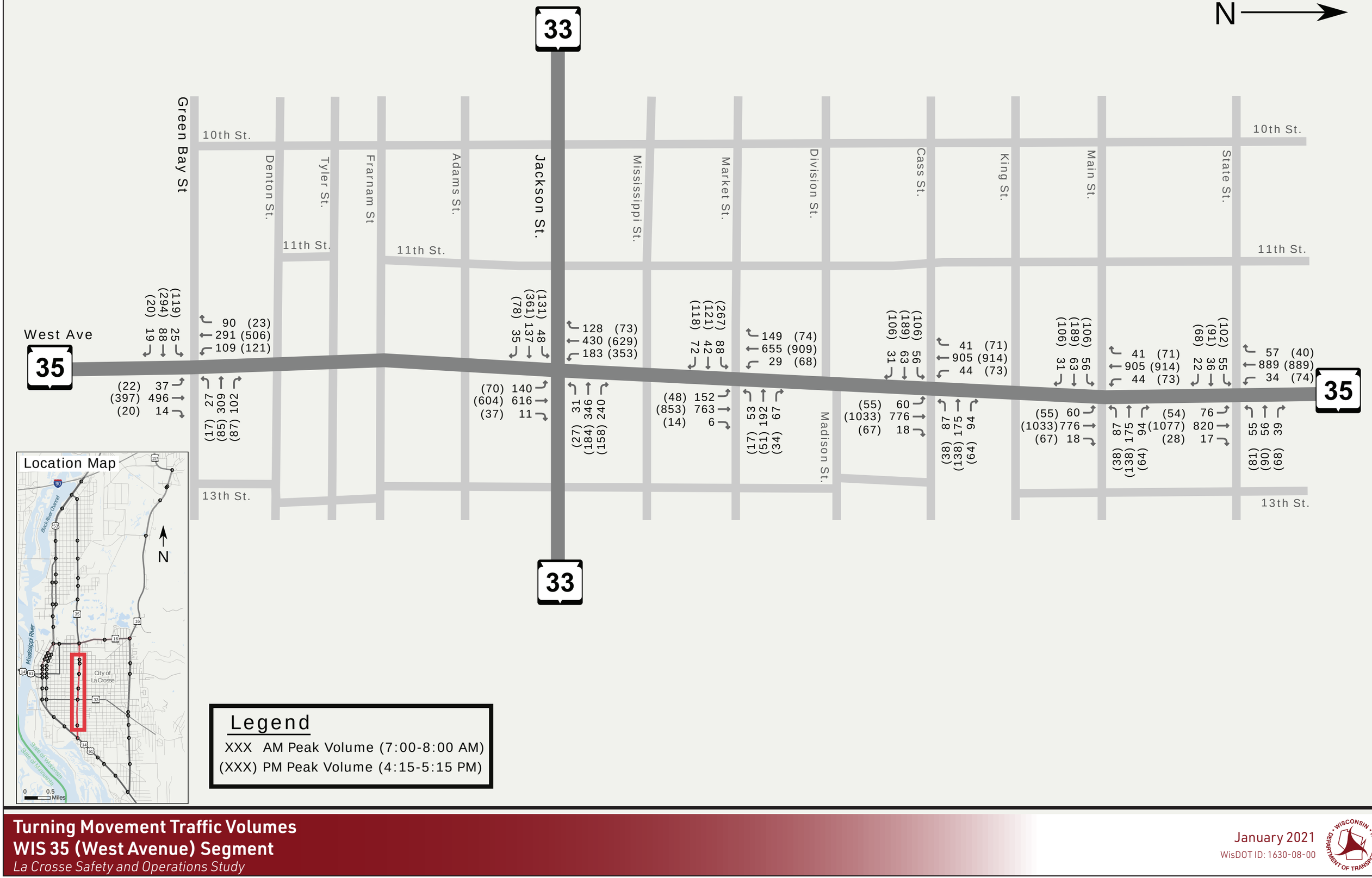
Turning Movement Traffic Volumes
WIS 35 (George Street) Segment

La Crosse Safety and Operations Study

January 2021

WisDOT ID: 1630-08-00

WISCONSIN DEPARTMENT OF TRANSPORTATION



Turning Movement Traffic Volumes
WIS 35 (West Avenue) Segment
La Crosse Safety and Operations Study

January 2021
WisDOT ID: 1630-08-00

HCM 6th Signalized Intersection Summary
1: STH 16 & STH 157/Mall Driveway

12/08/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	144	28	1245	11	19	0	624	793	13	1	711	128
Future Volume (veh/h)	144	28	1245	11	19	0	624	793	13	1	711	128
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1792	1723	1723	1772	1723	1723	1880	1723	1792	1870	1723
Adj Flow Rate, veh/h	153	30	0	12	20	0	664	844	9	1	756	84
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	424	171		188	162	0	784	2094	856	167	1542	725
Arrive On Green	0.06	0.10	0.00	0.01	0.05	0.00	0.25	0.59	0.59	0.10	0.43	0.43
Sat Flow, veh/h	3183	1792	1460	1641	3455	0	3183	3572	1460	1706	3554	1460
Grp Volume(v), veh/h	153	30	0	12	20	0	664	844	9	1	756	84
Grp Sat Flow(s),veh/h/ln	1591	1792	1460	1641	1683	0	1591	1786	1460	1706	1777	1460
Q Serve(g_s), s	5.8	2.0	0.0	0.9	0.7	0.0	25.8	16.6	0.2	0.1	19.9	4.0
Cycle Q Clear(g_c), s	5.8	2.0	0.0	0.9	0.7	0.0	25.8	16.6	0.2	0.1	19.9	4.0
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	424	171		188	162	0	784	2094	856	167	1542	725
V/C Ratio(X)	0.36	0.18		0.06	0.12	0.00	0.85	0.40	0.01	0.01	0.49	0.12
Avail Cap(c_a), veh/h	502	171		293	207	0	972	2094	856	167	1542	725
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.0	54.1	0.0	52.0	59.2	0.0	46.7	14.6	6.0	52.9	26.5	17.5
Incr Delay (d2), s/veh	0.2	0.2	0.0	0.1	0.1	0.0	4.9	0.6	0.0	0.0	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	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	4.2	1.6	0.0	0.6	0.6	0.0	14.6	9.7	0.2	0.1	12.0	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.2	54.3	0.0	52.0	59.4	0.0	51.6	15.2	6.0	52.9	27.6	17.8
LnGrp LOS	D	D		D	E	A	D	B	A	D	C	B
Approach Vol, veh/h		183	A		32			1517			841	
Approach Delay, s/veh		54.2			56.6			31.0			26.6	
Approach LOS		D			E			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	38.3	62.6	14.8	14.3	18.9	82.0	8.7	20.4
Change Period (Y+Rc), s	6.3	* 6.2	* 6.7	8.0	6.2	* 5.8	6.9	8.0
Max Green Setting (Gmax), s	39.7	* 44	* 11	8.0	7.8	* 76	10.1	9.0
Max Q Clear Time (g_c+I1), s	27.8	21.9	7.8	2.7	2.1	18.6	2.9	4.0
Green Ext Time (p_c), s	4.2	11.8	0.3	0.0	0.0	20.2	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	31.6
HCM 6th LOS	C

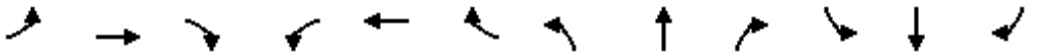
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
1: STH 16 & STH 157/Mall Driveway

12/09/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	275	121	746	69	108	20	811	965	124	7	971	341
Future Volume (veh/h)	275	121	746	69	108	20	811	965	124	7	971	341
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1792	1723	1723	1772	1723	1723	1880	1723	1792	1870	1723
Adj Flow Rate, veh/h	281	123	0	70	110	20	828	985	78	7	991	216
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	472	196		184	151	27	904	2320	948	14	1326	700
Arrive On Green	0.11	0.11	0.00	0.05	0.05	0.05	0.28	0.65	0.65	0.01	0.37	0.37
Sat Flow, veh/h	3183	1792	1460	1641	2856	508	3183	3572	1460	1706	3554	1460
Grp Volume(v), veh/h	281	123	0	70	64	66	828	985	78	7	991	216
Grp Sat Flow(s),veh/h/ln	1591	1792	1460	1641	1683	1681	1591	1786	1460	1706	1777	1460
Q Serve(g_s), s	11.9	9.6	0.0	5.5	5.4	5.7	36.8	19.5	2.9	0.6	35.4	13.2
Cycle Q Clear(g_c), s	11.9	9.6	0.0	5.5	5.4	5.7	36.8	19.5	2.9	0.6	35.4	13.2
Prop In Lane	1.00		1.00	1.00		0.30	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	472	196		184	89	89	904	2320	948	14	1326	700
V/C Ratio(X)	0.60	0.63		0.38	0.72	0.75	0.92	0.42	0.08	0.48	0.75	0.31
Avail Cap(c_a), veh/h	663	209		308	127	127	953	2320	948	79	1326	700
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.7	62.2	0.0	54.4	68.1	68.2	50.6	12.4	9.5	72.1	39.8	23.2
Incr Delay (d2), s/veh	0.4	3.7	0.0	0.5	4.2	6.9	12.4	0.6	0.2	9.0	3.9	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	7.6	7.3	0.0	4.1	4.4	4.7	20.9	10.9	1.7	0.5	20.8	7.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.2	65.9	0.0	54.9	72.3	75.0	63.0	13.0	9.7	81.1	43.7	24.3
LnGrp LOS	E	E		D	E	E	E	B	A	F	D	C
Approach Vol, veh/h		404	A		200			1891			1214	
Approach Delay, s/veh		59.8			67.1			34.7			40.4	
Approach LOS		E			E			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	47.8	60.3	22.2	15.7	7.4	100.6	14.0	24.0
Change Period (Y+Rc), s	6.3	5.8	* 6.7	8.0	* 6.2	5.8	6.9	8.0
Max Green Setting (Gmax), s	43.7	40.2	* 24	11.0	* 6.8	77.2	18.1	17.0
Max Q Clear Time (g_c+I1), s	38.8	37.4	13.9	7.7	2.6	21.5	7.5	11.6
Green Ext Time (p_c), s	2.7	2.4	1.7	0.0	0.0	23.6	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	41.1
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	158	1	94	0	0	0	0	309	0	40	1923	0
Future Volume (veh/h)	158	1	94	0	0	0	0	309	0	40	1923	0
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
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1723	1811	1723				0	1772	0	1723	1831	0
Adj Flow Rate, veh/h	180	1	107				0	351	0	45	2185	0
Peak Hour Factor	0.88	0.88	0.88				0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2				0	2	0	2	2	0
Cap, veh/h	240	1	204				0	2069	0	728	3571	0
Arrive On Green	0.14	0.14	0.14				0.00	0.61	0.00	0.04	0.71	0.00
Sat Flow, veh/h	1716	10	1460				0	3544	0	1641	5163	0
Grp Volume(v), veh/h	181	0	107				0	351	0	45	2185	0
Grp Sat Flow(s),veh/h/ln	1726	0	1460				0	1683	0	1641	1666	0
Q Serve(g_s), s	9.1	0.0	6.1				0.0	4.0	0.0	0.9	20.0	0.0
Cycle Q Clear(g_c), s	9.1	0.0	6.1				0.0	4.0	0.0	0.9	20.0	0.0
Prop In Lane	0.99		1.00				0.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	242	0	204				0	2069	0	728	3571	0
V/C Ratio(X)	0.75	0.00	0.52				0.00	0.17	0.00	0.06	0.61	0.00
Avail Cap(c_a), veh/h	362	0	307				0	2069	0	765	3571	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)	1.00	0.00	1.00				0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	37.2	0.0	35.9				0.0	7.5	0.0	5.7	6.5	0.0
Incr Delay (d2), s/veh	1.7	0.0	0.8				0.0	0.2	0.0	0.0	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 BackOfQ(90%),veh/ln	6.2	0.0	7.9				0.0	2.3	0.0	0.4	8.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.9	0.0	36.7				0.0	7.6	0.0	5.7	7.3	0.0
LnGrp LOS	D	A	D				A	A	A	A	A	A
Approach Vol, veh/h		288						351			2230	
Approach Delay, s/veh		38.1						7.6			7.3	
Approach LOS		D						A			A	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		70.3		19.7	9.0	61.3						
Change Period (Y+Rc), s		6.0		7.1	5.6	6.0						
Max Green Setting (Gmax), s		58.0		18.9	5.4	47.0						
Max Q Clear Time (g_c+I1), s		22.0		11.1	2.9	6.0						
Green Ext Time (p_c), s		35.5		1.5	0.0	8.9						

Intersection Summary												
HCM 6th Ctrl Delay			10.4									
HCM 6th LOS			B									

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	196	5	105	0	0	0	0	1035	0	48	1148	0
Future Volume (veh/h)	196	5	105	0	0	0	0	1035	0	48	1148	0
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
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1723	1811	1723				0	1772	0	1723	1831	0
Adj Flow Rate, veh/h	236	6	127				0	1247	0	58	1383	0
Peak Hour Factor	0.83	0.83	0.83				0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	2	2	2				0	2	0	2	2	0
Cap, veh/h	308	8	267				0	1926	0	290	3373	0
Arrive On Green	0.18	0.18	0.18				0.00	0.57	0.00	0.04	0.67	0.00
Sat Flow, veh/h	1684	43	1460				0	3544	0	1641	5163	0
Grp Volume(v), veh/h	242	0	127				0	1247	0	58	1383	0
Grp Sat Flow(s),veh/h/ln	1727	0	1460				0	1683	0	1641	1666	0
Q Serve(g_s), s	12.3	0.0	7.2				0.0	23.2	0.0	1.3	11.4	0.0
Cycle Q Clear(g_c), s	12.3	0.0	7.2				0.0	23.2	0.0	1.3	11.4	0.0
Prop In Lane	0.98		1.00				0.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	316	0	267				0	1926	0	290	3373	0
V/C Ratio(X)	0.77	0.00	0.48				0.00	0.65	0.00	0.20	0.41	0.00
Avail Cap(c_a), veh/h	467	0	395				0	1926	0	371	3373	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)	1.00	0.00	1.00				0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	35.7	0.0	33.7				0.0	13.4	0.0	10.5	6.7	0.0
Incr Delay (d2), s/veh	2.1	0.0	0.5				0.0	1.7	0.0	0.1	0.4	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 BackOfQ(90%),veh/ln	7.9	0.0	9.0				0.0	11.6	0.0	0.7	5.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.8	0.0	34.1				0.0	15.1	0.0	10.6	7.1	0.0
LnGrp LOS	D	A	C				A	B	A	B	A	A
Approach Vol, veh/h		369						1247			1441	
Approach Delay, s/veh		36.5						15.1			7.2	
Approach LOS		D						B			A	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		68.1		23.9	9.5	58.6						
Change Period (Y+Rc), s		6.0		7.1	5.6	6.0						
Max Green Setting (Gmax), s		54.0		24.9	8.4	40.0						
Max Q Clear Time (g_c+I1), s		13.4		14.3	3.3	25.2						
Green Ext Time (p_c), s		34.3		2.6	0.0	13.4						

Intersection Summary												
HCM 6th Ctrl Delay			14.0									
HCM 6th LOS			B									

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	31	1424	15	0	2163
Future Vol, veh/h	0	31	1424	15	0	2163
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	Free	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	34	1548	16	0	2351

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	774	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	341	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	341	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	341	-
HCM Lane V/C Ratio	-	0.099	-
HCM Control Delay (s)	-	16.7	-
HCM Lane LOS	-	C	-
HCM 95th %tile Q(veh)	-	0.3	-

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	55	1956	33	0	2225
Future Vol, veh/h	0	55	1956	33	0	2225
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	Free	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	60	2126	36	0	2418

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1063	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	219	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	219	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	27.5	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	219	-
HCM Lane V/C Ratio	-	0.273	-
HCM Control Delay (s)	-	27.5	-
HCM Lane LOS	-	D	-
HCM 95th %tile Q(veh)	-	1.1	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	24	0	1439	2122	41
Future Vol, veh/h	0	24	0	1439	2122	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	Free
Storage Length	-	0	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	26	0	1564	2307	45

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	1154	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	190	0	-	-	0
Stage 1	0	-	0	-	-	0
Stage 2	0	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	-	190	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	26.9	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT
Capacity (veh/h)	-	190	-
HCM Lane V/C Ratio	-	0.137	-
HCM Control Delay (s)	-	26.9	-
HCM Lane LOS	-	D	-
HCM 95th %tile Q(veh)	-	0.5	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	24	0	1989	2162	64
Future Vol, veh/h	0	24	0	1989	2162	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	Free
Storage Length	-	0	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	26	0	2162	2350	70

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	1175	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	184	0	-	-	0
Stage 1	0	-	0	-	-	0
Stage 2	0	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	-	184	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	27.8	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT
Capacity (veh/h)	-	184	-
HCM Lane V/C Ratio	-	0.142	-
HCM Control Delay (s)	-	27.8	-
HCM Lane LOS	-	D	-
HCM 95th %tile Q(veh)	-	0.5	-

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	0	588	42	511	1537	1	0	1	0	30	3	384
Future Volume (veh/h)	0	588	42	511	1537	1	0	1	0	30	3	384
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1841	1723	1723	1831	1723	1723	1723	1723	1723	1723	1723
Adj Flow Rate, veh/h	0	639	28	555	1671	1	0	1	0	33	3	292
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	204	1797	522	877	1883	1	0	2	0	136	12	939
Arrive On Green	0.00	0.36	0.36	0.28	0.53	0.53	0.00	0.00	0.00	0.09	0.09	0.09
Sat Flow, veh/h	1641	5025	1460	3183	3568	2	0	1723	0	1510	137	2569
Grp Volume(v), veh/h	0	639	28	555	815	857	0	1	0	36	0	292
Grp Sat Flow(s),veh/h/ln	1641	1675	1460	1591	1739	1831	0	1723	0	1647	0	1285
Q Serve(g_s), s	0.0	8.4	1.1	13.8	37.4	37.4	0.0	0.1	0.0	1.8	0.0	7.3
Cycle Q Clear(g_c), s	0.0	8.4	1.1	13.8	37.4	37.4	0.0	0.1	0.0	1.8	0.0	7.3
Prop In Lane	1.00		1.00	1.00		0.00	0.00		0.00	0.92		1.00
Lane Grp Cap(c), veh/h	204	1797	522	877	918	966	0	2	0	148	0	939
V/C Ratio(X)	0.00	0.36	0.05	0.63	0.89	0.89	0.00	0.42	0.00	0.24	0.00	0.31
Avail Cap(c_a), veh/h	204	1797	522	877	918	966	0	103	0	148	0	939
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	21.3	18.9	28.6	18.9	18.9	0.0	44.9	0.0	38.1	0.0	20.4
Incr Delay (d2), s/veh	0.0	0.6	0.2	3.5	12.4	11.9	0.0	38.9	0.0	0.3	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	0.0	5.5	0.7	8.4	21.3	22.1	0.0	0.1	0.0	1.4	0.0	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	21.8	19.1	32.1	31.3	30.8	0.0	83.8	0.0	38.4	0.0	20.5
LnGrp LOS	A	C	B	C	C	C	A	F	A	D	A	C
Approach Vol, veh/h		667			2227			1			328	
Approach Delay, s/veh		21.7			31.3			83.8			22.5	
Approach LOS		C			C			F			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	17.3	53.0		5.7	32.0	38.3		14.0				
Change Period (Y+Rc), s	6.1	5.5		* 5.6	7.2	* 6.1		5.9				
Max Green Setting (Gmax), s	5.9	47.5		* 5.4	24.8	* 28		8.1				
Max Q Clear Time (g_c+I1), s	0.0	39.4		2.1	15.8	10.4		9.3				
Green Ext Time (p_c), s	0.0	7.9		0.0	0.8	9.8		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		28.4	
HCM 6th LOS		C	

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	5	1424	70	449	828	2	3	0	1	40	13	661
Future Volume (veh/h)	5	1424	70	449	828	2	3	0	1	40	13	661
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1841	1723	1723	1831	1723	1723	1723	1723	1723	1723	1723
Adj Flow Rate, veh/h	5	1483	45	468	862	2	3	0	1	42	14	482
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	193	2284	664	443	1761	4	6	0	2	164	55	695
Arrive On Green	0.12	0.45	0.45	0.14	0.49	0.49	0.01	0.00	0.01	0.13	0.13	0.13
Sat Flow, veh/h	1641	5025	1460	3183	3561	8	1194	0	398	1245	415	2569
Grp Volume(v), veh/h	5	1483	45	468	421	443	4	0	0	56	0	482
Grp Sat Flow(s),veh/h/ln	1641	1675	1460	1591	1739	1829	1591	0	0	1660	0	1285
Q Serve(g_s), s	0.2	21.0	1.6	12.8	14.9	14.9	0.2	0.0	0.0	2.8	0.0	12.1
Cycle Q Clear(g_c), s	0.2	21.0	1.6	12.8	14.9	14.9	0.2	0.0	0.0	2.8	0.0	12.1
Prop In Lane	1.00		1.00	1.00		0.00	0.75		0.25	0.75		1.00
Lane Grp Cap(c), veh/h	193	2284	664	443	860	905	8	0	0	218	0	695
V/C Ratio(X)	0.03	0.65	0.07	1.06	0.49	0.49	0.48	0.00	0.00	0.26	0.00	0.69
Avail Cap(c_a), veh/h	193	2284	664	443	860	905	93	0	0	218	0	695
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.99	0.00	0.99
Uniform Delay (d), s/veh	35.9	19.4	14.1	39.6	15.5	15.5	45.6	0.0	0.0	35.9	0.0	30.1
Incr Delay (d2), s/veh	0.0	1.4	0.2	58.6	2.0	1.9	14.7	0.0	0.0	0.2	0.0	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	0.2	11.3	1.0	12.4	8.9	9.2	0.2	0.0	0.0	2.1	0.0	7.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.0	20.9	14.3	98.2	17.5	17.4	60.3	0.0	0.0	36.1	0.0	32.6
LnGrp LOS	D	C	B	F	B	B	E	A	A	D	A	C
Approach Vol, veh/h		1533			1332			4			538	
Approach Delay, s/veh		20.7			45.8			60.3			33.0	
Approach LOS		C			D			E			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	16.9	51.0		6.1	20.0	47.9		18.0				
Change Period (Y+Rc), s	6.1	5.5		* 5.6	7.2	* 6.1		5.9				
Max Green Setting (Gmax), s	5.9	45.5		* 5.4	12.8	* 38		12.1				
Max Q Clear Time (g_c+I1), s	2.2	16.9		2.2	14.8	23.0		14.1				
Green Ext Time (p_c), s	0.0	18.5		0.0	0.0	13.6		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		32.5
HCM 6th LOS		C

Notes

User approved pedestrian interval to be less than phase max green.

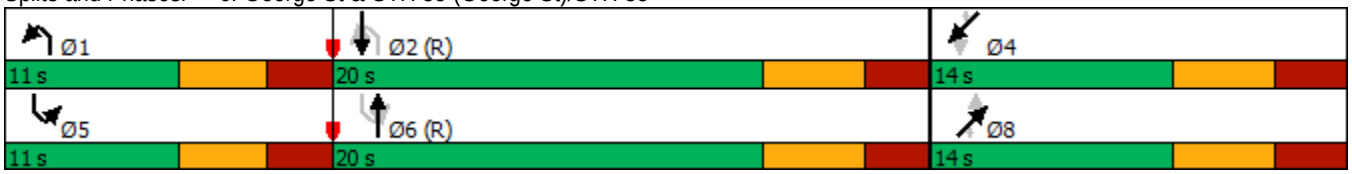
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	28	260	76	86	391	77	43	13	25	74	8	50
Future Volume (vph)	28	260	76	86	391	77	43	13	25	74	8	50
Satd. Flow (prot)	1630	3260	1458	1630	3260	1458	0	1652	1458	0	1642	1458
Flt Permitted	0.504			0.578				0.738			0.791	
Satd. Flow (perm)	865	3260	1458	992	3260	1458	0	1266	1458	0	1357	1458
Satd. Flow (RTOR)												
Lane Group Flow (vph)	30	283	83	93	425	84	0	61	17	0	89	34
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases	2		6	6		2	8		8	4		4
Total Split (s)	11.0	20.0	20.0	11.0	20.0	20.0	14.0	14.0	14.0	14.0	14.0	14.0
Total Lost Time (s)	5.2	5.6	5.6	5.2	5.6	5.6		5.9	5.9		5.9	5.9
Act Effct Green (s)	30.4	26.8	26.8	28.3	31.2	31.2		8.0	8.0		8.0	8.0
Actuated g/C Ratio	0.68	0.60	0.60	0.63	0.69	0.69		0.18	0.18		0.18	0.18
v/c Ratio	0.04	0.15	0.10	0.13	0.19	0.08		0.27	0.07		0.37	0.13
Control Delay	4.5	9.4	10.6	4.1	4.1	5.0		19.5	16.1		21.2	17.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	4.5	9.4	10.6	4.1	4.1	5.0		19.5	16.1		21.2	17.0
LOS	A	A	B	A	A	A		B	B		C	B
Approach Delay		9.3			4.2			18.8			20.0	
Approach LOS		A			A			B			C	
Queue Length 50th (ft)	3	26	15	7	16	6		14	4		21	8
Queue Length 95th (ft)	10	50	39	37	72	38		39	16		52	25
Internal Link Dist (ft)		281			557			284			255	
Turn Bay Length (ft)	160		30	200		150			100			100
Base Capacity (vph)	685	1943	869	709	2260	1011		227	262		244	262
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	0
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	0
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	0
Reduced v/c Ratio	0.04	0.15	0.10	0.13	0.19	0.08		0.27	0.06		0.36	0.13

Intersection Summary

Cycle Length: 45
Actuated Cycle Length: 45
Offset: 16 (36%), Referenced to phase 2:NBSB and 6:NBSB, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.37
Intersection Signal Delay: 8.4 Intersection LOS: A
Intersection Capacity Utilization 43.2% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 6: George St & STH 35 (George St)/STH 35

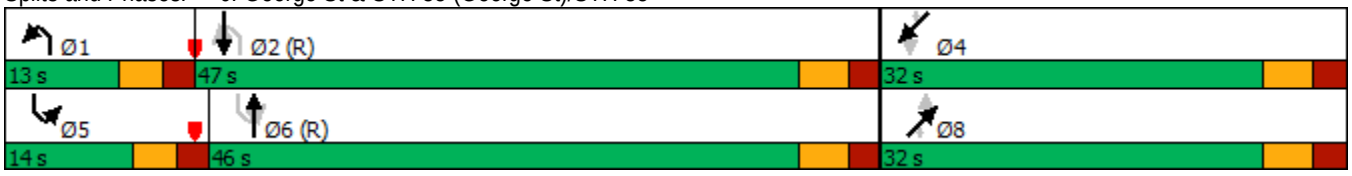


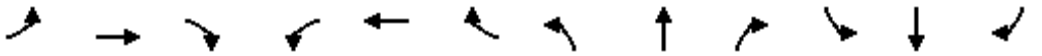
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	35	400	64	130	294	88	80	14	18	60	19	76
Future Volume (vph)	35	400	64	130	294	88	80	14	18	60	19	76
Satd. Flow (prot)	1630	3260	1458	1630	3260	1458	0	1645	1458	0	1654	1458
Flt Permitted	0.558			0.499				0.698			0.713	
Satd. Flow (perm)	957	3260	1458	856	3260	1458	0	1198	1458	0	1223	1458
Satd. Flow (RTOR)												
Lane Group Flow (vph)	38	435	70	141	320	96	0	102	12	0	86	51
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases	2		6	6		2	8		8	4		4
Total Split (s)	13.0	46.0	46.0	14.0	47.0	47.0	32.0	32.0	32.0	32.0	32.0	32.0
Total Lost Time (s)	5.2	5.6	5.6	5.2	5.6	5.6		5.9	5.9		5.9	5.9
Act Effct Green (s)	68.3	59.4	59.4	66.2	65.9	65.9		12.2	12.2		12.2	12.2
Actuated g/C Ratio	0.74	0.65	0.65	0.72	0.72	0.72		0.13	0.13		0.13	0.13
v/c Ratio	0.05	0.21	0.07	0.21	0.14	0.09		0.64	0.06		0.53	0.26
Control Delay	4.2	8.6	9.0	2.5	1.0	1.2		55.2	32.8		48.0	37.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	4.2	8.6	9.0	2.5	1.0	1.2		55.2	32.8		48.0	37.6
LOS	A	A	A	A	A	A		E	C		D	D
Approach Delay		8.3			1.4			52.8			44.1	
Approach LOS		A			A			D			D	
Queue Length 50th (ft)	5	52	15	3	5	3		58	6		48	27
Queue Length 95th (ft)	16	97	41	m29	7	m5		103	21		89	57
Internal Link Dist (ft)		281			557			284			255	
Turn Bay Length (ft)	160		30	200		150			100			100
Base Capacity (vph)	783	2103	940	712	2335	1044		339	413		346	413
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	0
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	0
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	0
Reduced v/c Ratio	0.05	0.21	0.07	0.20	0.14	0.09		0.30	0.03		0.25	0.12

Intersection Summary

Cycle Length: 92
Actuated Cycle Length: 92
Offset: 14 (15%), Referenced to phase 2:NBSB and 6:NBSB, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 12.9 Intersection LOS: B
Intersection Capacity Utilization 46.5% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: George St & STH 35 (George St)/STH 35





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	1	17	234	5	152	0	1215	98	92	1856	22
Future Volume (veh/h)	10	1	17	234	5	152	0	1215	98	92	1856	22
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1723	1723	1723	1772	1723	1792	1870	1723	1792	1870	1723
Adj Flow Rate, veh/h	11	1	12	273	0	108	0	1397	70	106	2133	16
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	40	4	39	322	0	143	149	2127	874	128	2083	856
Arrive On Green	0.03	0.03	0.03	0.10	0.00	0.10	0.00	0.60	0.60	0.08	0.59	0.59
Sat Flow, veh/h	1510	137	1460	3281	0	1460	1706	3554	1460	1706	3554	1460
Grp Volume(v), veh/h	12	0	12	273	0	108	0	1397	70	106	2133	16
Grp Sat Flow(s),veh/h/ln	1647	0	1460	1641	0	1460	1706	1777	1460	1706	1777	1460
Q Serve(g_s), s	0.9	0.0	1.0	10.6	0.0	9.4	0.0	33.8	2.6	8.0	76.2	0.6
Cycle Q Clear(g_c), s	0.9	0.0	1.0	10.6	0.0	9.4	0.0	33.8	2.6	8.0	76.2	0.6
Prop In Lane	0.92		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	44	0	39	322	0	143	149	2127	874	128	2083	856
V/C Ratio(X)	0.27	0.00	0.31	0.85	0.00	0.76	0.00	0.66	0.08	0.83	1.02	0.02
Avail Cap(c_a), veh/h	105	0	93	331	0	147	149	2127	874	160	2083	856
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	62.0	0.0	62.1	57.7	0.0	57.1	0.0	17.3	11.0	59.3	26.9	11.3
Incr Delay (d2), s/veh	1.2	0.0	1.6	17.1	0.0	17.1	0.0	1.6	0.2	20.1	26.1	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	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	0.7	0.0	0.7	8.1	0.0	6.8	0.0	17.7	1.5	6.7	44.9	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.2	0.0	63.7	74.8	0.0	74.3	0.0	18.9	11.2	79.4	53.0	11.3
LnGrp LOS	E	A	E	E	A	E	A	B	B	E	F	B
Approach Vol, veh/h		24			381			1467			2255	
Approach Delay, s/veh		63.5			74.6			18.5			53.9	
Approach LOS		E			E			B			D	

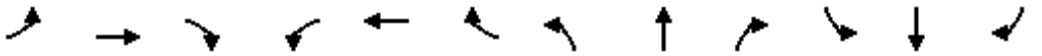
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	17.2	82.0		20.6	15.6	83.6		10.2				
Change Period (Y+Rc), s	5.8	* 5.8		* 7.9	* 5.8	5.8		6.7				
Max Green Setting (Gmax), s	6.2	* 76		* 13	* 12	70.2		8.3				
Max Q Clear Time (g_c+I1), s	0.0	78.2		12.6	10.0	35.8		3.0				
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	31.2		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			43.3									
HCM 6th LOS			D									

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	0	8	124	1	106	0	1746	188	153	1516	13
Future Volume (veh/h)	16	0	8	124	1	106	0	1746	188	153	1516	13
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1723	1723	1723	1772	1723	1792	1870	1723	1792	1870	1723
Adj Flow Rate, veh/h	17	0	5	132	0	69	0	1838	123	161	1596	8
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	40	0	35	202	0	90	200	2229	916	183	2195	902
Arrive On Green	0.02	0.00	0.02	0.06	0.00	0.06	0.00	0.63	0.63	0.11	0.62	0.62
Sat Flow, veh/h	1641	0	1460	3281	0	1460	1706	3554	1460	1706	3554	1460
Grp Volume(v), veh/h	17	0	5	132	0	69	0	1838	123	161	1596	8
Grp Sat Flow(s),veh/h/ln	1641	0	1460	1641	0	1460	1706	1777	1460	1706	1777	1460
Q Serve(g_s), s	1.5	0.0	0.5	5.7	0.0	6.8	0.0	58.3	5.0	13.6	45.5	0.3
Cycle Q Clear(g_c), s	1.5	0.0	0.5	5.7	0.0	6.8	0.0	58.3	5.0	13.6	45.5	0.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	40	0	35	202	0	90	200	2229	916	183	2195	902
V/C Ratio(X)	0.43	0.00	0.14	0.65	0.00	0.77	0.00	0.82	0.13	0.88	0.73	0.01
Avail Cap(c_a), veh/h	127	0	113	249	0	111	200	2229	916	306	2195	902
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	70.2	0.0	69.7	67.0	0.0	67.5	0.0	21.0	11.1	64.2	19.4	10.7
Incr Delay (d2), s/veh	2.7	0.0	0.7	2.2	0.0	17.3	0.0	3.6	0.3	7.9	2.1	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	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	1.2	0.0	0.3	4.4	0.0	5.2	0.0	29.3	2.9	9.4	23.4	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.9	0.0	70.4	69.2	0.0	84.8	0.0	24.6	11.4	72.1	21.5	10.7
LnGrp LOS	E	A	E	E	A	F	A	C	B	E	C	B
Approach Vol, veh/h		22			201			1961			1765	
Approach Delay, s/veh		72.3			74.6			23.8			26.1	
Approach LOS		E			E			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	22.9	96.0		16.9	21.5	97.4		10.2				
Change Period (Y+Rc), s	5.8	* 5.8		* 7.9	* 5.8	5.8		6.7				
Max Green Setting (Gmax), s	7.2	* 90		* 11	* 26	71.2		11.3				
Max Q Clear Time (g_c+I1), s	0.0	47.5		8.8	15.6	60.3		3.5				
Green Ext Time (p_c), s	0.0	39.5		0.2	0.1	10.8		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			27.7									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (veh/h)	16	26	632	26	23	1517
Future Volume (veh/h)	16	26	632	26	23	1517
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1723	1792	1811	1723	1723	1811
Adj Flow Rate, veh/h	17	0	687	18	25	1649
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	50		2558	1085	627	2865
Arrive On Green	0.03	0.00	0.74	0.74	0.03	0.83
Sat Flow, veh/h	1641	1518	3532	1460	1641	3532
Grp Volume(v), veh/h	17	0	687	18	25	1649
Grp Sat Flow(s),veh/h/ln	1641	1518	1721	1460	1641	1721
Q Serve(g_s), s	0.9	0.0	5.8	0.3	0.3	13.9
Cycle Q Clear(g_c), s	0.9	0.0	5.8	0.3	0.3	13.9
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	50		2558	1085	627	2865
V/C Ratio(X)	0.34		0.27	0.02	0.04	0.58
Avail Cap(c_a), veh/h	151		2558	1085	681	2865
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.7	0.0	3.7	3.0	2.6	2.4
Incr Delay (d2), s/veh	1.4	0.0	0.3	0.0	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	0.7	0.0	2.5	0.1	0.1	3.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	44.2	0.0	4.0	3.0	2.6	3.3
LnGrp LOS	D		A	A	A	A
Approach Vol, veh/h	17	A	705			1674
Approach Delay, s/veh	44.2		3.9			3.3
Approach LOS	D		A			A

Timer - Assigned Phs		2			5	6	8
Phs Duration (G+Y+Rc), s		81.5			8.0	73.5	8.5
Change Period (Y+Rc), s		6.6			5.7	6.6	5.7
Max Green Setting (Gmax), s		69.4			5.3	58.4	8.3
Max Q Clear Time (g_c+I1), s		15.9			2.3	7.8	2.9
Green Ext Time (p_c), s		49.4			0.0	20.6	0.0

Intersection Summary	
HCM 6th Ctrl Delay	3.7
HCM 6th LOS	A

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

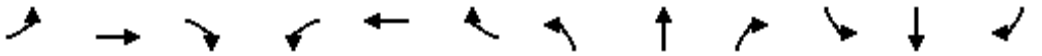
Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (veh/h)	32	60	1387	44	48	781
Future Volume (veh/h)	32	60	1387	44	48	781
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1723	1792	1811	1723	1723	1811
Adj Flow Rate, veh/h	33	0	1445	28	50	814
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	81		2463	1045	326	2811
Arrive On Green	0.05	0.00	0.72	0.72	0.04	0.82
Sat Flow, veh/h	1641	1518	3532	1460	1641	3532
Grp Volume(v), veh/h	33	0	1445	28	50	814
Grp Sat Flow(s),veh/h/ln	1641	1518	1721	1460	1641	1721
Q Serve(g_s), s	1.8	0.0	18.9	0.5	0.7	5.2
Cycle Q Clear(g_c), s	1.8	0.0	18.9	0.5	0.7	5.2
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	81		2463	1045	326	2811
V/C Ratio(X)	0.41		0.59	0.03	0.15	0.29
Avail Cap(c_a), veh/h	166		2463	1045	374	2811
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.4	0.0	6.4	3.8	5.1	2.0
Incr Delay (d2), s/veh	1.2	0.0	1.0	0.0	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	1.3	0.0	8.2	0.2	0.3	1.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	43.6	0.0	7.4	3.8	5.2	2.3
LnGrp LOS	D		A	A	A	A
Approach Vol, veh/h	33	A	1473			864
Approach Delay, s/veh	43.6		7.4			2.5
Approach LOS	D		A			A

Timer - Assigned Phs		2			5	6	8
Phs Duration (G+Y+Rc), s		81.7			9.3	72.4	10.3
Change Period (Y+Rc), s		6.6			5.7	6.6	5.7
Max Green Setting (Gmax), s		70.4			6.3	58.4	9.3
Max Q Clear Time (g_c+I1), s		7.2			2.7	20.9	3.8
Green Ext Time (p_c), s		28.6			0.0	33.5	0.0

Intersection Summary	
HCM 6th Ctrl Delay	6.1
HCM 6th LOS	A

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	158	12	126	26	13	6	238	1093	26	6	1507	253
Future Volume (veh/h)	158	12	126	26	13	6	238	1093	26	6	1507	253
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1811	1792	1723	1723	1723	1723	1880	1723	1777	1856	1709
Adj Flow Rate, veh/h	183	0	86	29	14	7	262	1201	18	7	1656	172
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	3	3	3
Cap, veh/h	234	0	307	53	35	17	417	2304	942	65	1958	908
Arrive On Green	0.07	0.00	0.07	0.03	0.03	0.03	0.13	0.64	0.64	0.04	0.56	0.56
Sat Flow, veh/h	3281	0	1518	1641	1083	542	3183	3572	1460	1693	3526	1448
Grp Volume(v), veh/h	183	0	86	29	0	21	262	1201	18	7	1656	172
Grp Sat Flow(s),veh/h/ln	1641	0	1518	1641	0	1625	1591	1786	1460	1693	1763	1448
Q Serve(g_s), s	7.1	0.0	0.0	2.3	0.0	1.6	10.1	23.4	0.6	0.5	51.2	6.5
Cycle Q Clear(g_c), s	7.1	0.0	0.0	2.3	0.0	1.6	10.1	23.4	0.6	0.5	51.2	6.5
Prop In Lane	1.00		1.00	1.00		0.33	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	234	0	307	53	0	52	417	2304	942	65	1958	908
V/C Ratio(X)	0.78	0.00	0.28	0.55	0.00	0.40	0.63	0.52	0.02	0.11	0.85	0.19
Avail Cap(c_a), veh/h	300	0	338	91	0	90	417	2304	942	76	1958	908
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.4	0.0	43.8	62.0	0.0	61.7	53.5	12.3	8.3	60.3	24.2	10.3
Incr Delay (d2), s/veh	7.2	0.0	0.2	3.3	0.0	1.8	2.3	0.8	0.0	0.3	4.7	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	5.4	0.0	4.3	1.8	0.0	1.3	6.7	12.4	0.3	0.4	26.7	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.6	0.0	44.0	65.3	0.0	63.5	55.7	13.2	8.3	60.6	29.0	10.7
LnGrp LOS	E	A	D	E	A	E	E	B	A	E	C	B
Approach Vol, veh/h		269			50			1481			1835	
Approach Delay, s/veh		59.4			64.5			20.7			27.4	
Approach LOS		E			E			C			C	

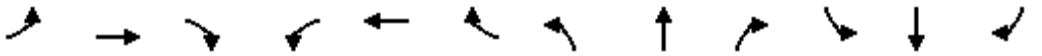
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	23.6	78.0		17.4	11.2	90.4		11.0				
Change Period (Y+Rc), s	6.6	* 5.8		* 8.1	* 6.2	* 6.6		6.8				
Max Green Setting (Gmax), s	11.4	* 72		* 12	* 5.8	* 78		7.2				
Max Q Clear Time (g_c+I1), s	12.1	53.2		9.1	2.5	25.4		4.3				
Green Ext Time (p_c), s	0.0	18.3		0.1	0.0	39.9		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			27.5									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	305	24	191	28	20	28	205	1645	34	31	1317	288
Future Volume (veh/h)	305	24	191	28	20	28	205	1645	34	31	1317	288
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1811	1792	1723	1723	1723	1723	1880	1723	1806	1885	1736
Adj Flow Rate, veh/h	347	0	127	30	22	30	220	1769	23	33	1416	192
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	1	1	1
Cap, veh/h	515	0	446	74	30	41	436	2051	838	59	1698	928
Arrive On Green	0.16	0.00	0.16	0.05	0.05	0.05	0.14	0.57	0.57	0.03	0.47	0.47
Sat Flow, veh/h	3281	0	1518	1641	660	900	3183	3572	1460	1720	3582	1471
Grp Volume(v), veh/h	347	0	127	30	0	52	220	1769	23	33	1416	192
Grp Sat Flow(s),veh/h/ln	1641	0	1518	1641	0	1561	1591	1786	1460	1720	1791	1471
Q Serve(g_s), s	14.6	0.0	0.0	2.6	0.0	4.8	9.4	61.0	1.0	2.8	50.2	8.1
Cycle Q Clear(g_c), s	14.6	0.0	0.0	2.6	0.0	4.8	9.4	61.0	1.0	2.8	50.2	8.1
Prop In Lane	1.00		1.00	1.00		0.58	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	515	0	446	74	0	70	436	2051	838	59	1698	928
V/C Ratio(X)	0.67	0.00	0.28	0.41	0.00	0.74	0.50	0.86	0.03	0.56	0.83	0.21
Avail Cap(c_a), veh/h	515	0	446	103	0	98	436	2051	838	80	1698	928
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.0	0.0	39.7	67.8	0.0	68.9	58.4	26.2	13.5	69.4	33.4	11.4
Incr Delay (d2), s/veh	6.9	0.0	1.6	1.3	0.0	9.0	0.4	5.1	0.1	3.1	5.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	9.7	0.0	6.3	2.0	0.0	3.8	6.2	31.9	0.6	2.2	28.0	6.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.9	0.0	41.3	69.1	0.0	77.8	58.8	31.3	13.5	72.5	38.4	11.9
LnGrp LOS	E	A	D	E	A	E	E	C	B	E	D	B
Approach Vol, veh/h		474			82			2012			1641	
Approach Delay, s/veh		58.6			74.6			34.1			36.0	
Approach LOS		E			E			C			D	

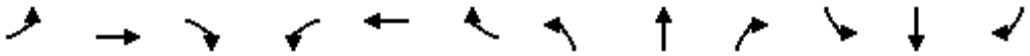
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	26.6	75.0		31.0	11.2	90.4		13.4				
Change Period (Y+Rc), s	6.6	* 5.8		* 8.1	* 6.2	* 6.6		6.8				
Max Green Setting (Gmax), s	17.4	* 69		* 23	* 6.8	* 80		9.2				
Max Q Clear Time (g_c+I1), s	11.4	52.2		16.6	4.8	63.0		6.8				
Green Ext Time (p_c), s	0.2	15.8		0.6	0.0	16.8		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			38.4									
HCM 6th LOS			D									

Notes

User approved volume balancing among the lanes for turning movement.

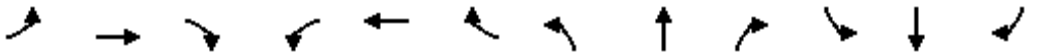
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	113	41	55	120	63	57	280	12	67	500	42
Future Volume (veh/h)	44	113	41	55	120	63	57	280	12	67	500	42
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1641	1575	1641	1654	1588	1654	1695	1628	1695	1723	1654	1723
Adj Flow Rate, veh/h	48	124	45	60	132	69	63	308	13	74	549	46
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	8	8	8	7	7	7	4	4	4	2	2	2
Cap, veh/h	258	191	69	290	177	93	310	674	28	536	662	55
Arrive On Green	0.05	0.17	0.17	0.05	0.18	0.18	0.06	0.43	0.43	0.06	0.44	0.44
Sat Flow, veh/h	1563	1103	400	1576	982	513	1615	1550	65	1641	1505	126
Grp Volume(v), veh/h	48	0	169	60	0	201	63	0	321	74	0	595
Grp Sat Flow(s),veh/h/ln	1563	0	1503	1576	0	1496	1615	0	1616	1641	0	1631
Q Serve(g_s), s	1.4	0.0	6.0	1.8	0.0	7.3	1.2	0.0	8.1	1.4	0.0	18.5
Cycle Q Clear(g_c), s	1.4	0.0	6.0	1.8	0.0	7.3	1.2	0.0	8.1	1.4	0.0	18.5
Prop In Lane	1.00		0.27	1.00		0.34	1.00		0.04	1.00		0.08
Lane Grp Cap(c), veh/h	258	0	261	290	0	270	310	0	702	536	0	717
V/C Ratio(X)	0.19	0.00	0.65	0.21	0.00	0.74	0.20	0.00	0.46	0.14	0.00	0.83
Avail Cap(c_a), veh/h	1000	0	1567	753	0	1560	389	0	1685	608	0	1701
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.5	0.0	22.1	18.2	0.0	22.3	10.9	0.0	11.5	8.3	0.0	14.2
Incr Delay (d2), s/veh	0.1	0.0	1.0	0.1	0.0	1.5	0.1	0.0	0.3	0.0	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	0.9	0.0	3.7	1.1	0.0	4.6	0.7	0.0	4.7	0.8	0.0	9.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.6	0.0	23.1	18.3	0.0	23.8	11.0	0.0	11.8	8.3	0.0	16.1
LnGrp LOS	B	A	C	B	A	C	B	A	B	A	A	B
Approach Vol, veh/h		217			261			384			669	
Approach Delay, s/veh		22.1			22.6			11.7			15.3	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.2	30.3	6.1	15.0	6.5	30.0	5.7	15.4
Change Period (Y+Rc), s	3.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0
Max Green Setting (Gmax), s	6.0	60.0	20.0	60.0	6.0	60.0	30.0	60.0
Max Q Clear Time (g_c+I1), s	3.2	20.5	3.8	8.0	3.4	10.1	3.4	9.3
Green Ext Time (p_c), s	0.0	4.4	0.1	0.8	0.0	2.7	0.1	1.0

Intersection Summary	
HCM 6th Ctrl Delay	16.6
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	87	42	60	122	76	65	593	25	43	327	28
Future Volume (veh/h)	45	87	42	60	122	76	65	593	25	43	327	28
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1682	1614	1682	1695	1628	1695	1723	1654	1723	1709	1641	1709
Adj Flow Rate, veh/h	50	97	47	67	136	84	72	659	28	48	363	31
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	5	5	5	4	4	4	2	2	2	3	3	3
Cap, veh/h	228	180	87	300	173	107	509	779	33	274	721	62
Arrive On Green	0.04	0.18	0.18	0.05	0.18	0.18	0.05	0.49	0.49	0.04	0.48	0.48
Sat Flow, veh/h	1602	1027	498	1615	941	581	1641	1575	67	1628	1490	127
Grp Volume(v), veh/h	50	0	144	67	0	220	72	0	687	48	0	394
Grp Sat Flow(s),veh/h/ln	1602	0	1525	1615	0	1523	1641	0	1642	1628	0	1618
Q Serve(g_s), s	1.7	0.0	5.9	2.3	0.0	9.5	1.5	0.0	24.9	1.0	0.0	11.4
Cycle Q Clear(g_c), s	1.7	0.0	5.9	2.3	0.0	9.5	1.5	0.0	24.9	1.0	0.0	11.4
Prop In Lane	1.00		0.33	1.00		0.38	1.00		0.04	1.00		0.08
Lane Grp Cap(c), veh/h	228	0	268	300	0	279	509	0	812	274	0	783
V/C Ratio(X)	0.22	0.00	0.54	0.22	0.00	0.79	0.14	0.00	0.85	0.17	0.00	0.50
Avail Cap(c_a), veh/h	858	0	1335	686	0	1333	563	0	1437	346	0	1416
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.1	0.0	25.7	21.6	0.0	26.7	8.7	0.0	15.0	12.4	0.0	12.1
Incr Delay (d2), s/veh	0.2	0.0	0.6	0.1	0.0	1.9	0.0	0.0	1.9	0.1	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	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	1.1	0.0	3.8	1.5	0.0	5.8	0.8	0.0	12.4	0.6	0.0	6.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.3	0.0	26.4	21.7	0.0	28.6	8.7	0.0	16.9	12.5	0.0	12.4
LnGrp LOS	C	A	C	C	A	C	A	A	B	B	A	B
Approach Vol, veh/h		194			287			759			442	
Approach Delay, s/veh		25.3			27.0			16.2			12.4	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.7	38.2	6.6	17.0	6.0	38.9	6.1	17.6
Change Period (Y+Rc), s	3.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0
Max Green Setting (Gmax), s	6.0	60.0	20.0	60.0	6.0	60.0	30.0	60.0
Max Q Clear Time (g_c+I1), s	3.5	13.4	4.3	7.9	3.0	26.9	3.7	11.5
Green Ext Time (p_c), s	0.1	2.6	0.2	0.7	0.0	7.0	0.2	1.1

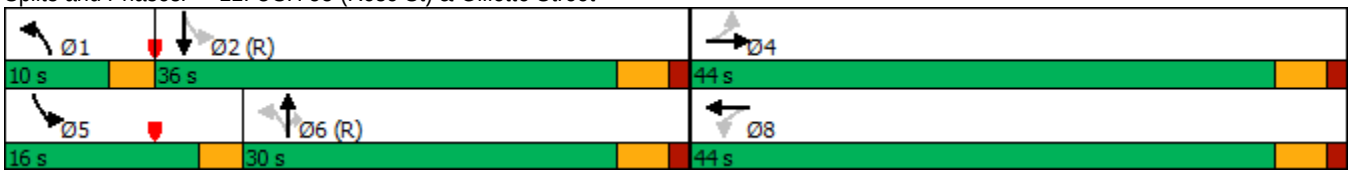
Intersection Summary	
HCM 6th Ctrl Delay	18.1
HCM 6th LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	6	18	67	2	49	10	550	37	43	1301	7
Future Volume (vph)	9	6	18	67	2	49	10	550	37	43	1301	7
Satd. Flow (prot)	0	1777	0	1448	1351	0	1488	3140	1377	1560	3253	0
Flt Permitted		0.911		0.730			0.117			0.361		
Satd. Flow (perm)	0	1640	0	1113	1351	0	183	3140	1377	593	3253	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	42	0	84	64	0	13	688	29	54	1635	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4			8			6		6	2		
Total Split (s)	44.0	44.0		44.0	44.0		10.0	30.0	30.0	16.0	36.0	
Total Lost Time (s)		5.0		5.0	5.0		3.0	5.0	5.0	3.0	5.0	
Act Effct Green (s)		12.2		12.2	12.2		70.2	65.2	65.2	72.3	70.2	
Actuated g/C Ratio		0.14		0.14	0.14		0.78	0.72	0.72	0.80	0.78	
v/c Ratio		0.19		0.56	0.35		0.06	0.30	0.03	0.10	0.64	
Control Delay		35.2		50.0	39.7		2.0	4.7	2.7	0.9	3.1	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		35.2		50.0	39.7		2.0	4.7	2.7	0.9	3.1	
LOS		D		D	D		A	A	A	A	A	
Approach Delay		35.2			45.5			4.5			3.0	
Approach LOS		D			D			A			A	
Queue Length 50th (ft)		22		46	34		0	43	1	1	20	
Queue Length 95th (ft)		43		76	60		m1	148	m7	m1	124	
Internal Link Dist (ft)		163			303			1438			1458	
Turn Bay Length (ft)				60			80		100	130		
Base Capacity (vph)		710		482	585		247	2273	997	619	2536	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.06		0.17	0.11		0.05	0.30	0.03	0.09	0.64	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 23 (26%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 6.4 Intersection LOS: A
Intersection Capacity Utilization 58.0% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: USH 53 (Rose St) & Gillette Street

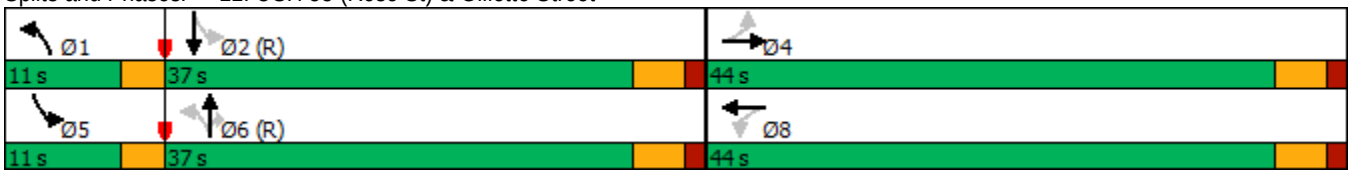


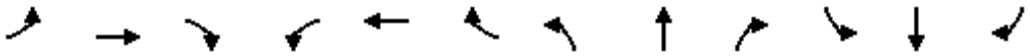
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	0	19	83	5	69	21	1311	95	61	765	13
Future Volume (vph)	23	0	19	83	5	69	21	1311	95	61	765	13
Satd. Flow (prot)	0	1777	0	1448	1356	0	1488	3140	1377	1560	3249	0
Flt Permitted		0.807		0.815			0.275			0.088		
Satd. Flow (perm)	0	1473	0	1242	1356	0	431	3140	1377	145	3249	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	53	0	104	92	0	26	1639	74	76	972	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4			8			6		6	2		
Total Split (s)	44.0	44.0		44.0	44.0		11.0	37.0	37.0	11.0	37.0	
Total Lost Time (s)		5.0		5.0	5.0		3.0	5.0	5.0	3.0	5.0	
Act Effct Green (s)		13.7		13.7	13.7		67.4	61.4	61.4	69.5	65.0	
Actuated g/C Ratio		0.15		0.15	0.15		0.73	0.67	0.67	0.76	0.71	
v/c Ratio		0.24		0.56	0.46		0.07	0.78	0.08	0.39	0.42	
Control Delay		35.5		47.3	41.9		1.3	13.9	2.7	14.6	5.7	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		35.5		47.3	41.9		1.3	13.9	2.7	14.6	5.7	
LOS		D		D	D		A	B	A	B	A	
Approach Delay		35.5			44.8			13.3			6.3	
Approach LOS		D			D			B			A	
Queue Length 50th (ft)		28		58	50		0	443	7	7	52	
Queue Length 95th (ft)		50		88	79		m1	515	m7	17	137	
Internal Link Dist (ft)		163			303			1438			1458	
Turn Bay Length (ft)				60			80		100	130		
Base Capacity (vph)		624		526	574		418	2094	918	233	2295	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.08		0.20	0.16		0.06	0.78	0.08	0.33	0.42	

Intersection Summary

Cycle Length: 92
Actuated Cycle Length: 92
Offset: 40 (43%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 13.3 Intersection LOS: B
Intersection Capacity Utilization 63.7% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: USH 53 (Rose St) & Gillette Street

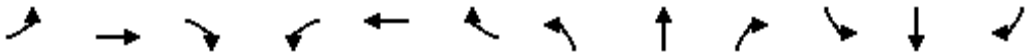




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	224	524	44	151	42	157	482	22	75	1113	12
Future Volume (veh/h)	47	224	524	44	151	42	157	482	22	75	1113	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1737	1723	1723	1723	1723	1723	1737	1723	1723	1723	1723
Adj Flow Rate, veh/h	52	246	357	48	166	46	173	530	24	82	1223	13
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	262	458	385	196	342	95	303	1748	79	547	1735	18
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.07	0.54	0.54	0.05	0.52	0.52
Sat Flow, veh/h	1170	1737	1460	816	1298	360	1641	3216	145	1641	3318	35
Grp Volume(v), veh/h	52	246	357	48	0	212	173	272	282	82	603	633
Grp Sat Flow(s),veh/h/ln	1170	1737	1460	816	0	1658	1641	1651	1711	1641	1637	1716
Q Serve(g_s), s	3.5	10.9	21.4	4.8	0.0	9.7	4.2	8.1	8.1	2.0	25.1	25.1
Cycle Q Clear(g_c), s	13.2	10.9	21.4	15.8	0.0	9.7	4.2	8.1	8.1	2.0	25.1	25.1
Prop In Lane	1.00		1.00	1.00		0.22	1.00		0.08	1.00		0.02
Lane Grp Cap(c), veh/h	262	458	385	196	0	437	303	897	930	547	856	898
V/C Ratio(X)	0.20	0.54	0.93	0.24	0.00	0.48	0.57	0.30	0.30	0.15	0.70	0.71
Avail Cap(c_a), veh/h	279	483	406	208	0	461	354	897	930	631	856	898
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.6	28.4	32.3	35.2	0.0	28.0	14.1	11.2	11.2	8.9	16.2	16.2
Incr Delay (d2), s/veh	0.1	0.4	25.9	0.2	0.0	0.3	0.6	0.9	0.8	0.0	4.8	4.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	1.8	7.2	14.2	1.7	0.0	6.3	2.5	5.2	5.3	1.2	13.8	14.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.7	28.9	58.2	35.4	0.0	28.3	14.7	12.1	12.1	9.0	21.1	20.9
LnGrp LOS	C	C	E	D	A	C	B	B	B	A	C	C
Approach Vol, veh/h		655			260			727			1318	
Approach Delay, s/veh		45.2			29.6			12.7			20.2	
Approach LOS		D			C			B			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.2	52.1		28.7	7.4	53.9		28.7				
Change Period (Y+Rc), s	3.0	5.0		5.0	3.0	5.0		5.0				
Max Green Setting (Gmax), s	9.0	43.0		25.0	9.0	43.0		25.0				
Max Q Clear Time (g_c+I1), s	6.2	0.0		23.4	4.0	10.1		17.8				
Green Ext Time (p_c), s	0.0	0.0		0.3	0.0	9.0		0.4				

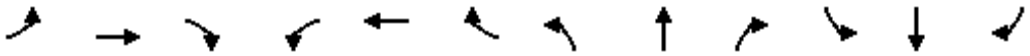
Intersection Summary			
HCM 6th Ctrl Delay		24.7	
HCM 6th LOS		C	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	137	75	60	179	65	210	1250	48	132	660	43
Future Volume (veh/h)	71	137	75	60	179	65	210	1250	48	132	660	43
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1737	1723	1723	1723	1723	1723	1737	1723	1723	1723	1723
Adj Flow Rate, veh/h	77	149	51	65	195	71	228	1359	52	143	717	47
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	182	417	350	278	289	105	493	1811	69	268	1670	109
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.08	0.56	0.56	0.06	0.54	0.54
Sat Flow, veh/h	1113	1737	1460	1182	1205	439	1641	3242	124	1641	3118	204
Grp Volume(v), veh/h	77	149	51	65	0	266	228	691	720	143	376	388
Grp Sat Flow(s),veh/h/ln	1113	1737	1460	1182	0	1644	1641	1651	1715	1641	1637	1686
Q Serve(g_s), s	6.2	6.6	2.5	4.4	0.0	13.5	5.5	29.2	29.4	3.6	12.7	12.8
Cycle Q Clear(g_c), s	19.7	6.6	2.5	11.0	0.0	13.5	5.5	29.2	29.4	3.6	12.7	12.8
Prop In Lane	1.00		1.00	1.00		0.27	1.00		0.07	1.00		0.12
Lane Grp Cap(c), veh/h	182	417	350	278	0	395	493	922	958	268	877	903
V/C Ratio(X)	0.42	0.36	0.15	0.23	0.00	0.67	0.46	0.75	0.75	0.53	0.43	0.43
Avail Cap(c_a), veh/h	266	548	460	367	0	518	660	922	958	473	877	903
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.6	29.1	27.5	33.6	0.0	31.7	8.8	15.4	15.4	14.7	12.9	12.9
Incr Delay (d2), s/veh	0.6	0.2	0.1	0.2	0.0	1.0	0.3	5.6	5.4	0.6	1.5	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	3.1	4.8	1.6	2.3	0.0	8.3	3.2	15.7	16.2	2.2	7.6	7.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.2	29.2	27.6	33.8	0.0	32.7	9.1	21.0	20.8	15.3	14.4	14.4
LnGrp LOS	D	C	C	C	A	C	A	C	C	B	B	B
Approach Vol, veh/h		277			331			1639			907	
Approach Delay, s/veh		32.3			32.9			19.3			14.5	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.6	54.3		27.1	8.5	56.4		27.1				
Change Period (Y+Rc), s	3.0	5.0		5.0	3.0	5.0		5.0				
Max Green Setting (Gmax), s	17.0	33.0		29.0	17.0	33.0		29.0				
Max Q Clear Time (g_c+I1), s	7.5	0.0		21.7	5.6	31.4		15.5				
Green Ext Time (p_c), s	0.2	0.0		0.4	0.1	1.5		0.6				

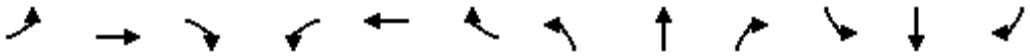
Intersection Summary			
HCM 6th Ctrl Delay		20.5	
HCM 6th LOS		C	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	122	196	95	56	4	132	317	158	1	589	28
Future Volume (veh/h)	16	122	196	95	56	4	132	317	158	1	589	28
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1695	1695	1628	1682	1682	1614	1695	1695	1695	1636	1636	1636
Adj Flow Rate, veh/h	19	142	141	110	65	3	153	369	114	1	685	33
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	4	4	4	5	5	5	4	4	4	2	2	2
Cap, veh/h	30	226	209	143	84	191	363	1634	729	49	1182	57
Arrive On Green	0.15	0.15	0.15	0.14	0.14	0.14	0.07	0.51	0.51	0.40	0.40	0.40
Sat Flow, veh/h	199	1487	1379	1025	606	1368	1615	3221	1437	1	2956	142
Grp Volume(v), veh/h	161	0	141	175	0	3	153	369	114	379	0	340
Grp Sat Flow(s),veh/h/ln	1685	0	1379	1631	0	1368	1615	1611	1437	1635	0	1463
Q Serve(g_s), s	6.7	0.0	7.2	7.7	0.0	0.1	3.9	4.7	3.2	0.0	0.0	13.5
Cycle Q Clear(g_c), s	6.7	0.0	7.2	7.7	0.0	0.1	3.9	4.7	3.2	13.5	0.0	13.5
Prop In Lane	0.12		1.00	0.63		1.00	1.00		1.00	0.00		0.10
Lane Grp Cap(c), veh/h	256	0	209	227	0	191	363	1634	729	703	0	585
V/C Ratio(X)	0.63	0.00	0.67	0.77	0.00	0.02	0.42	0.23	0.16	0.54	0.00	0.58
Avail Cap(c_a), veh/h	792	0	648	766	0	643	363	1946	868	1036	0	884
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.6	0.0	29.8	30.9	0.0	27.7	12.6	10.2	9.8	17.5	0.0	17.5
Incr Delay (d2), s/veh	2.5	0.0	3.7	5.4	0.0	0.0	0.9	0.1	0.2	1.4	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	5.0	0.0	4.6	5.6	0.0	0.1	2.5	2.9	1.8	8.0	0.0	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.2	0.0	33.6	36.4	0.0	27.7	13.5	10.4	10.0	18.8	0.0	19.4
LnGrp LOS	C	A	C	D	A	C	B	B	B	B	A	B
Approach Vol, veh/h		302			178			636			719	
Approach Delay, s/veh		32.8			36.2			11.1			19.1	
Approach LOS		C			D			B			B	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	8.0	34.8		15.4		42.8		16.3				
Change Period (Y+Rc), s	3.0	5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s	5.0	45.0		35.0		45.0		35.0				
Max Q Clear Time (g_c+I1), s	5.9	15.5		9.7		6.7		9.2				
Green Ext Time (p_c), s	0.0	14.3		0.9		6.3		2.1				

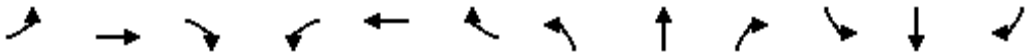
Intersection Summary			
HCM 6th Ctrl Delay		20.2	
HCM 6th LOS		C	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	69	152	72	59	11	223	637	158	2	370	47
Future Volume (veh/h)	25	69	152	72	59	11	223	637	158	2	370	47
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1723	1654	1723	1723	1654	1709	1709	1709	1622	1622	1622
Adj Flow Rate, veh/h	27	76	104	79	65	7	245	700	108	2	407	52
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	3	3	3	3	3	3
Cap, veh/h	70	197	220	137	113	209	433	1467	654	59	868	110
Arrive On Green	0.16	0.16	0.16	0.15	0.15	0.15	0.08	0.45	0.45	0.32	0.32	0.32
Sat Flow, veh/h	446	1255	1402	920	757	1402	1628	3247	1448	2	2691	340
Grp Volume(v), veh/h	103	0	104	144	0	7	245	700	108	245	0	216
Grp Sat Flow(s),veh/h/ln	1700	0	1402	1677	0	1402	1628	1624	1448	1619	0	1415
Q Serve(g_s), s	3.4	0.0	4.2	5.0	0.0	0.3	5.0	9.3	2.7	0.0	0.0	7.6
Cycle Q Clear(g_c), s	3.4	0.0	4.2	5.0	0.0	0.3	5.0	9.3	2.7	7.5	0.0	7.6
Prop In Lane	0.26		1.00	0.55		1.00	1.00		1.00	0.01		0.24
Lane Grp Cap(c), veh/h	267	0	220	250	0	209	433	1467	654	581	0	457
V/C Ratio(X)	0.39	0.00	0.47	0.57	0.00	0.03	0.57	0.48	0.17	0.42	0.00	0.47
Avail Cap(c_a), veh/h	960	0	792	947	0	792	433	2358	1052	1227	0	1027
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.5	0.0	23.8	24.5	0.0	22.5	14.1	11.9	10.1	16.7	0.0	16.8
Incr Delay (d2), s/veh	0.9	0.0	1.6	2.1	0.0	0.1	1.9	0.5	0.3	1.0	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	2.5	0.0	2.6	3.7	0.0	0.2	4.1	5.4	1.5	4.9	0.0	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.4	0.0	25.4	26.6	0.0	22.6	16.0	12.4	10.3	17.8	0.0	18.4
LnGrp LOS	C	A	C	C	A	C	B	B	B	B	A	B
Approach Vol, veh/h		207			151			1053			461	
Approach Delay, s/veh		24.9			26.4			13.0			18.1	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	8.0	25.0		14.3		33.0		14.7				
Change Period (Y+Rc), s	3.0	5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s	5.0	45.0		35.0		45.0		35.0				
Max Q Clear Time (g_c+I1), s	7.0	9.6		7.0		11.3		6.2				
Green Ext Time (p_c), s	0.0	9.6		0.8		14.2		1.4				

Intersection Summary												
HCM 6th Ctrl Delay			16.7									
HCM 6th LOS			B									

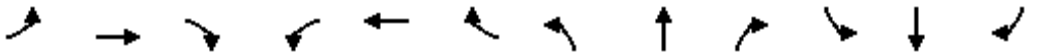


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	14	0	0	7	13	14	601	34	0	0	0
Future Volume (veh/h)	9	14	0	0	7	13	14	601	34	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1723	1654	0	0	1654	1654	1723	1723	1723			
Adj Flow Rate, veh/h	10	15	0	0	8	9	15	653	37			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	282	80	0	0	80	68	43	1934	115			
Arrive On Green	0.05	0.05	0.00	0.00	0.05	0.05	0.61	0.61	0.61			
Sat Flow, veh/h	1396	1654	0	0	1654	1402	69	3151	188			
Grp Volume(v), veh/h	10	15	0	0	8	9	372	0	333			
Grp Sat Flow(s),veh/h/ln	1396	1654	0	0	1654	1402	1719	0	1689			
Q Serve(g_s), s	0.2	0.3	0.0	0.0	0.2	0.2	3.5	0.0	3.1			
Cycle Q Clear(g_c), s	0.4	0.3	0.0	0.0	0.2	0.2	3.5	0.0	3.1			
Prop In Lane	1.00		0.00	0.00		1.00	0.04		0.11			
Lane Grp Cap(c), veh/h	282	80	0	0	80	68	1055	0	1037			
V/C Ratio(X)	0.04	0.19	0.00	0.00	0.10	0.13	0.35	0.00	0.32			
Avail Cap(c_a), veh/h	1500	1523	0	0	1523	1290	1530	0	1503			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	15.0	14.9	0.0	0.0	14.8	14.8	3.1	0.0	3.0			
Incr Delay (d2), s/veh	0.1	1.1	0.0	0.0	0.5	0.9	0.2	0.0	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 BackOfQ(90%),veh/ln	0.1	0.2	0.0	0.0	0.1	0.1	0.6	0.0	0.5			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.0	16.0	0.0	0.0	15.4	15.7	3.3	0.0	3.2			
LnGrp LOS	B	B	A	A	B	B	A	A	A			
Approach Vol, veh/h		25			17			705				
Approach Delay, s/veh		15.6			15.5			3.3				
Approach LOS		B			B			A				
Timer - Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		26.0		6.6				6.6				
Change Period (Y+Rc), s		6.0		5.0				5.0				
Max Green Setting (Gmax), s		29.0		30.0				30.0				
Max Q Clear Time (g_c+I1), s		5.5		2.4				2.2				
Green Ext Time (p_c), s		6.6		0.0				0.0				

Intersection Summary	
HCM 6th Ctrl Delay	3.9
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	15	0	0	44	45	12	1504	26	0	0	0
Future Volume (veh/h)	15	15	0	0	44	45	12	1504	26	0	0	0
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			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1723	1654	0	0	1654	1654	1723	1723	1723			
Adj Flow Rate, veh/h	16	16	0	0	48	30	13	1635	28			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	119	97	0	0	97	82	21	2751	49			
Arrive On Green	0.06	0.06	0.00	0.00	0.06	0.06	0.82	0.82	0.82			
Sat Flow, veh/h	1321	1654	0	0	1654	1402	25	3348	60			
Grp Volume(v), veh/h	16	16	0	0	48	30	879	0	797			
Grp Sat Flow(s),veh/h/ln	1321	1654	0	0	1654	1402	1721	0	1712			
Q Serve(g_s), s	1.1	0.8	0.0	0.0	2.6	1.9	17.1	0.0	14.3			
Cycle Q Clear(g_c), s	3.7	0.8	0.0	0.0	2.6	1.9	17.1	0.0	14.3			
Prop In Lane	1.00		0.00	0.00		1.00	0.01		0.04			
Lane Grp Cap(c), veh/h	119	97	0	0	97	82	1415	0	1407			
V/C Ratio(X)	0.13	0.16	0.00	0.00	0.49	0.36	0.62	0.00	0.57			
Avail Cap(c_a), veh/h	429	485	0	0	485	411	1415	0	1407			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	43.8	41.2	0.0	0.0	42.0	41.7	3.0	0.0	2.7			
Incr Delay (d2), s/veh	0.5	0.8	0.0	0.0	3.9	2.7	2.1	0.0	1.7			
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 BackOfQ(90%),veh/ln	0.7	0.7	0.0	0.0	2.1	1.3	6.3	0.0	5.4			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.3	42.0	0.0	0.0	45.8	44.3	5.0	0.0	4.4			
LnGrp LOS	D	D	A	A	D	D	A	A	A			
Approach Vol, veh/h		32			78			1676				
Approach Delay, s/veh		43.1			45.3			4.7				
Approach LOS		D			D			A				
Timer - Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		81.6		10.4				10.4				
Change Period (Y+Rc), s		6.0		5.0				5.0				
Max Green Setting (Gmax), s		54.0		27.0				27.0				
Max Q Clear Time (g_c+I1), s		19.1		5.7				4.6				
Green Ext Time (p_c), s		24.0		0.1				0.3				
Intersection Summary												
HCM 6th Ctrl Delay			7.2									
HCM 6th LOS			A									

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	289	45	581	184	33	845
Future Volume (veh/h)	289	45	581	184	33	845
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1513	1513	1609	1609	1622	1622
Adj Flow Rate, veh/h	373	0	653	128	37	949
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	11	11	4	4	3	3
Cap, veh/h	554	246	1778	1055	467	2041
Arrive On Green	0.19	0.00	0.58	0.58	0.04	0.66
Sat Flow, veh/h	2882	1282	3137	1363	1545	3163
Grp Volume(v), veh/h	373	0	653	128	37	949
Grp Sat Flow(s),veh/h/ln	1441	1282	1528	1363	1545	1541
Q Serve(g_s), s	8.3	0.0	7.8	1.6	0.6	10.3
Cycle Q Clear(g_c), s	8.3	0.0	7.8	1.6	0.6	10.3
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	554	246	1778	1055	467	2041
V/C Ratio(X)	0.67	0.00	0.37	0.12	0.08	0.46
Avail Cap(c_a), veh/h	1467	653	2890	1551	859	2914
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.8	0.0	7.6	1.9	5.1	5.7
Incr Delay (d2), s/veh	1.4	0.0	0.3	0.1	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	5.0	0.0	4.1	1.4	0.3	4.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	27.2	0.0	7.9	2.0	5.1	6.0
LnGrp LOS	C	A	A	A	A	A
Approach Vol, veh/h	373		781			986
Approach Delay, s/veh	27.2		7.0			6.0
Approach LOS	C		A			A

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		50.5		18.2	5.5	45.0
Change Period (Y+Rc), s		5.0		5.0	3.0	5.0
Max Green Setting (Gmax), s		65.0		35.0	20.0	65.0
Max Q Clear Time (g_c+I1), s		12.3		10.3	2.6	9.8
Green Ext Time (p_c), s		23.4		3.0	0.0	17.8

Intersection Summary	
HCM 6th Ctrl Delay	10.0
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	268	42	981	367	20	581
Future Volume (veh/h)	268	42	981	367	20	581
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1595	1595	1636	1636	1636	1636
Adj Flow Rate, veh/h	327	0	1044	242	21	618
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	5	5	2	2	2	2
Cap, veh/h	497	221	1970	1105	319	2172
Arrive On Green	0.16	0.00	0.63	0.63	0.02	0.70
Sat Flow, veh/h	3038	1352	3190	1386	1558	3190
Grp Volume(v), veh/h	327	0	1044	242	21	618
Grp Sat Flow(s),veh/h/ln	1519	1352	1554	1386	1558	1554
Q Serve(g_s), s	7.3	0.0	13.5	3.1	0.3	5.4
Cycle Q Clear(g_c), s	7.3	0.0	13.5	3.1	0.3	5.4
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	497	221	1970	1105	319	2172
V/C Ratio(X)	0.66	0.00	0.53	0.22	0.07	0.28
Avail Cap(c_a), veh/h	1463	651	2780	1467	711	2780
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.5	0.0	7.3	1.8	5.4	4.1
Incr Delay (d2), s/veh	1.5	0.0	0.5	0.2	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	4.8	0.0	6.1	2.5	0.1	2.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	30.0	0.0	7.8	2.0	5.4	4.3
LnGrp LOS	C	A	A	A	A	A
Approach Vol, veh/h	327		1286			639
Approach Delay, s/veh	30.0		6.7			4.3
Approach LOS	C		A			A

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		55.8		16.9	4.7	51.1
Change Period (Y+Rc), s		5.0		5.0	3.0	5.0
Max Green Setting (Gmax), s		65.0		35.0	20.0	65.0
Max Q Clear Time (g_c+I1), s		7.4		9.3	2.3	15.5
Green Ext Time (p_c), s		12.8		2.6	0.0	30.6

Intersection Summary	
HCM 6th Ctrl Delay	9.4
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	5	0	0	9	5	39	626	10	0	0	0
Future Vol, veh/h	26	5	0	0	9	5	39	626	10	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	28	5	0	0	10	5	42	680	11	0	0	0

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	429	775	-	-	770	346	0	0	0
Stage 1	0	0	-	-	770	-	-	-	-
Stage 2	429	775	-	-	0	-	-	-	-
Critical Hdwy	7.54	6.54	-	-	6.54	6.94	4.14	-	-
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	-	-	4.02	3.32	2.22	-	-
Pot Cap-1 Maneuver	510	327	0	0	330	650	-	-	-
Stage 1	-	-	0	0	408	-	-	-	-
Stage 2	574	406	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	494	327	-	-	330	650	-	-	-
Mov Cap-2 Maneuver	494	327	-	-	330	-	-	-	-
Stage 1	-	-	-	-	408	-	-	-	-
Stage 2	556	406	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	13.5	14.4	
HCM LOS	B	B	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	-	-	-	456	400
HCM Lane V/C Ratio	-	-	-	0.074	0.038
HCM Control Delay (s)	-	-	-	13.5	14.4
HCM Lane LOS	-	-	-	B	B
HCM 95th %tile Q(veh)	-	-	-	0.2	0.1

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	36	3	0	0	12	6	39	1548	13	0	0	0
Future Vol, veh/h	36	3	0	0	12	6	39	1548	13	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	39	3	0	0	13	7	42	1683	14	0	0	0

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	932	1781	-	-	1774	849	0	0	0
Stage 1	0	0	-	-	1774	-	-	-	-
Stage 2	932	1781	-	-	0	-	-	-	-
Critical Hdwy	7.54	6.54	-	-	6.54	6.94	4.14	-	-
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	-	-	4.02	3.32	2.22	-	-
Pot Cap-1 Maneuver	221	81	0	0	82	304	-	-	-
Stage 1	-	-	0	0	134	-	-	-	-
Stage 2	287	133	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	190	81	-	-	82	304	-	-	-
Mov Cap-2 Maneuver	190	81	-	-	82	-	-	-	-
Stage 1	-	-	-	-	134	-	-	-	-
Stage 2	254	133	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	32.6	45.6	
HCM LOS	D	E	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	-	-	-	172	108
HCM Lane V/C Ratio	-	-	-	0.246	0.181
HCM Control Delay (s)	-	-	-	32.6	45.6
HCM Lane LOS	-	-	-	D	E
HCM 95th %tile Q(veh)	-	-	-	0.9	0.6

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	21	0	19	17	0	0	0	0	16	1425	7
Future Vol, veh/h	0	21	0	19	17	0	0	0	0	16	1425	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	23	0	21	18	0	0	0	0	17	1549	8

Major/Minor	Minor2			Minor1					Major2		
Conflicting Flow All	-	1587	779	820	1591	-			0	0	0
Stage 1	-	1587	-	0	0	-			-	-	-
Stage 2	-	0	-	820	1591	-			-	-	-
Critical Hdwy	-	6.54	6.94	7.54	6.54	-			4.14	-	-
Critical Hdwy Stg 1	-	5.54	-	-	-	-			-	-	-
Critical Hdwy Stg 2	-	-	-	6.54	5.54	-			-	-	-
Follow-up Hdwy	-	4.02	3.32	3.52	4.02	-			2.22	-	-
Pot Cap-1 Maneuver	0	107	339	267	106	0			-	-	-
Stage 1	0	166	-	-	-	0			-	-	-
Stage 2	0	-	-	335	166	0			-	-	-
Platoon blocked, %										-	-
Mov Cap-1 Maneuver	-	107	339	223	106	-			-	-	-
Mov Cap-2 Maneuver	-	107	-	223	106	-			-	-	-
Stage 1	-	166	-	-	-	-			-	-	-
Stage 2	-	-	-	289	166	-			-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	47.5	38.1	
HCM LOS	E	E	

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	107	147	-	-	-
HCM Lane V/C Ratio	0.213	0.266	-	-	-
HCM Control Delay (s)	47.5	38.1	-	-	-
HCM Lane LOS	E	E	-	-	-
HCM 95th %tile Q(veh)	0.8	1	-	-	-

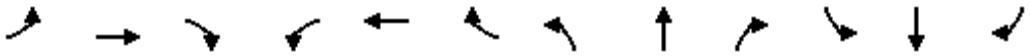
Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	18	4	32	16	0	0	0	0	16	870	8
Future Vol, veh/h	0	18	4	32	16	0	0	0	0	16	870	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	20	4	35	17	0	0	0	0	17	946	9

Major/Minor	Minor2			Minor1					Major2		
Conflicting Flow All	-	985	478	517	989	-			0	0	0
Stage 1	-	985	-	0	0	-			-	-	-
Stage 2	-	0	-	517	989	-			-	-	-
Critical Hdwy	-	6.54	6.94	7.54	6.54	-			4.14	-	-
Critical Hdwy Stg 1	-	5.54	-	-	-	-			-	-	-
Critical Hdwy Stg 2	-	-	-	6.54	5.54	-			-	-	-
Follow-up Hdwy	-	4.02	3.32	3.52	4.02	-			2.22	-	-
Pot Cap-1 Maneuver	0	247	534	441	245	0			-	-	-
Stage 1	0	324	-	-	-	0			-	-	-
Stage 2	0	-	-	509	323	0			-	-	-
Platoon blocked, %										-	-
Mov Cap-1 Maneuver	-	247	534	411	245	-			-	-	-
Mov Cap-2 Maneuver	-	247	-	411	245	-			-	-	-
Stage 1	-	324	-	-	-	-			-	-	-
Stage 2	-	-	-	474	323	-			-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	19.4	17.7	
HCM LOS	C	C	

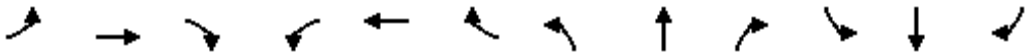
Minor Lane/Major Mvmt	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	274	335	-	-	-
HCM Lane V/C Ratio	0.087	0.156	-	-	-
HCM Control Delay (s)	19.4	17.7	-	-	-
HCM Lane LOS	C	C	-	-	-
HCM 95th %tile Q(veh)	0.3	0.5	-	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	7	35	31	5	33	22	684	27	50	1055	16
Future Volume (veh/h)	44	7	35	31	5	33	22	684	27	50	1055	16
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1627	1627	1627	1709	1709	1709	1695	1695	1695	1695	1695	1695
Adj Flow Rate, veh/h	48	8	38	34	5	36	24	752	18	55	1159	18
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	9	9	9	3	3	3	4	4	4	4	4	4
Cap, veh/h	317	41	196	319	30	217	317	1696	756	477	1786	28
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.03	0.53	0.53	0.05	0.55	0.55
Sat Flow, veh/h	1290	246	1170	1349	180	1296	1615	3221	1437	1615	3247	50
Grp Volume(v), veh/h	48	0	46	34	0	41	24	752	18	55	575	602
Grp Sat Flow(s),veh/h/ln	1290	0	1417	1349	0	1476	1615	1611	1437	1615	1611	1686
Q Serve(g_s), s	1.8	0.0	1.5	1.2	0.0	1.3	0.4	7.9	0.3	0.8	13.8	13.8
Cycle Q Clear(g_c), s	3.1	0.0	1.5	2.8	0.0	1.3	0.4	7.9	0.3	0.8	13.8	13.8
Prop In Lane	1.00		0.83	1.00		0.88	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	317	0	238	319	0	248	317	1696	756	477	886	928
V/C Ratio(X)	0.15	0.00	0.19	0.11	0.00	0.17	0.08	0.44	0.02	0.12	0.65	0.65
Avail Cap(c_a), veh/h	803	0	771	828	0	804	858	2046	913	980	1023	1071
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.0	0.0	19.7	20.9	0.0	19.6	7.0	8.1	6.3	5.6	8.7	8.7
Incr Delay (d2), s/veh	0.2	0.0	0.4	0.1	0.0	0.3	0.0	0.3	0.0	0.0	1.3	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	1.0	0.0	0.9	0.7	0.0	0.8	0.2	3.9	0.1	0.4	6.4	6.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.2	0.0	20.1	21.0	0.0	19.9	7.1	8.3	6.3	5.7	10.0	9.9
LnGrp LOS	C	A	C	C	A	B	A	A	A	A	A	A
Approach Vol, veh/h		94			75			794			1232	
Approach Delay, s/veh		20.7			20.4			8.2			9.8	
Approach LOS		C			C			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.5	35.8		14.7	5.8	34.5		14.7				
Change Period (Y+Rc), s	3.0	5.5		5.5	3.0	5.5		5.5				
Max Green Setting (Gmax), s	20.0	35.0		30.0	20.0	35.0		30.0				
Max Q Clear Time (g_c+I1), s	2.4	15.8		4.8	2.8	9.9		5.1				
Green Ext Time (p_c), s	0.0	14.5		0.3	0.1	12.9		0.4				

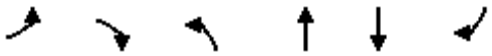
Intersection Summary			
HCM 6th Ctrl Delay		10.0	
HCM 6th LOS		B	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	6	34	47	7	54	30	1264	42	51	769	20
Future Volume (veh/h)	49	6	34	47	7	54	30	1264	42	51	769	20
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1750	1709	1709	1709	1723	1723	1723	1723	1723	1723
Adj Flow Rate, veh/h	51	6	35	49	7	56	31	1317	27	53	801	21
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	3	3	3	2	2	2	2	2	2
Cap, veh/h	290	36	210	309	27	212	462	1814	809	304	1856	49
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.03	0.55	0.55	0.05	0.57	0.57
Sat Flow, veh/h	1360	222	1295	1355	164	1310	1641	3273	1460	1641	3258	85
Grp Volume(v), veh/h	51	0	41	49	0	63	31	1317	27	53	402	420
Grp Sat Flow(s),veh/h/ln	1360	0	1517	1355	0	1473	1641	1637	1460	1641	1637	1707
Q Serve(g_s), s	2.0	0.0	1.4	1.9	0.0	2.2	0.5	17.9	0.5	0.8	8.4	8.4
Cycle Q Clear(g_c), s	4.3	0.0	1.4	3.3	0.0	2.2	0.5	17.9	0.5	0.8	8.4	8.4
Prop In Lane	1.00		0.85	1.00		0.89	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	290	0	246	309	0	239	462	1814	809	304	932	973
V/C Ratio(X)	0.18	0.00	0.17	0.16	0.00	0.26	0.07	0.73	0.03	0.17	0.43	0.43
Avail Cap(c_a), veh/h	754	0	763	771	0	741	957	1921	857	774	960	1002
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.7	0.0	21.5	23.0	0.0	21.9	5.6	9.9	6.0	7.9	7.3	7.3
Incr Delay (d2), s/veh	0.3	0.0	0.3	0.2	0.0	0.6	0.0	1.5	0.0	0.1	0.4	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	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	1.2	0.0	0.9	1.1	0.0	1.4	0.2	8.3	0.2	0.4	4.2	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.0	0.0	21.8	23.2	0.0	22.5	5.7	11.4	6.1	8.0	7.7	7.7
LnGrp LOS	C	A	C	C	A	C	A	B	A	A	A	A
Approach Vol, veh/h		92			112			1375			875	
Approach Delay, s/veh		23.1			22.8			11.1			7.7	
Approach LOS		C			C			B			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.0	39.5		15.2	5.9	38.6		15.2				
Change Period (Y+Rc), s	3.0	5.5		5.5	3.0	5.5		5.5				
Max Green Setting (Gmax), s	20.0	35.0		30.0	20.0	35.0		30.0				
Max Q Clear Time (g_c+I1), s	2.5	10.4		5.3	2.8	19.9		6.3				
Green Ext Time (p_c), s	0.0	12.5		0.5	0.0	13.2		0.4				

Intersection Summary			
HCM 6th Ctrl Delay		10.9	
HCM 6th LOS		B	



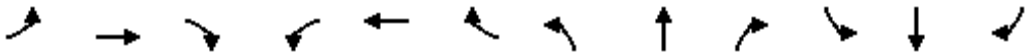
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	56	64	128	699	978	123
Future Volume (veh/h)	56	64	128	699	978	123
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1654	1654	1709	1709	1695	1695
Adj Flow Rate, veh/h	62	44	142	777	1087	85
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	7	7	3	3	4	4
Cap, veh/h	124	111	440	2246	1742	777
Arrive On Green	0.08	0.08	0.09	0.69	0.54	0.54
Sat Flow, veh/h	1576	1402	1628	3333	3306	1437
Grp Volume(v), veh/h	62	44	142	777	1087	85
Grp Sat Flow(s),veh/h/ln	1576	1402	1628	1624	1611	1437
Q Serve(g_s), s	1.8	1.4	1.5	4.6	11.2	1.4
Cycle Q Clear(g_c), s	1.8	1.4	1.5	4.6	11.2	1.4
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	124	111	440	2246	1742	777
V/C Ratio(X)	0.50	0.40	0.32	0.35	0.62	0.11
Avail Cap(c_a), veh/h	986	877	975	2370	2351	1049
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.2	21.0	5.4	3.0	7.6	5.4
Incr Delay (d2), s/veh	3.1	2.3	0.2	0.1	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	1.3	0.9	0.4	1.0	4.9	0.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	24.3	23.3	5.6	3.1	8.2	5.5
LnGrp LOS	C	C	A	A	A	A
Approach Vol, veh/h	106			919	1172	
Approach Delay, s/veh	23.9			3.5	8.0	
Approach LOS	C			A	A	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	7.2	31.4				38.7	9.3
Change Period (Y+Rc), s	3.0	5.5				5.5	5.5
Max Green Setting (Gmax), s	20.0	35.0				35.0	30.0
Max Q Clear Time (g_c+I1), s	3.5	13.2				6.6	3.8
Green Ext Time (p_c), s	0.2	12.7				12.2	0.6

Intersection Summary	
HCM 6th Ctrl Delay	6.9
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.



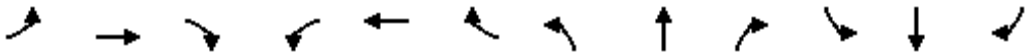
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	152	0	122	0	0	0	139	1185	0	0	742	85
Future Volume (veh/h)	152	0	122	0	0	0	139	1185	0	0	742	85
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1709	0	1709				1723	1723	0	0	1723	1723
Adj Flow Rate, veh/h	157	0	78				143	1222	0	0	765	54
Peak Hour Factor	0.97	0.92	0.97				0.97	0.97	0.92	0.92	0.97	0.97
Percent Heavy Veh, %	3	0	3				2	2	0	0	2	2
Cap, veh/h	257	0	228				494	2000	0	0	1501	669
Arrive On Green	0.16	0.00	0.16				0.09	0.61	0.00	0.00	0.46	0.46
Sat Flow, veh/h	1628	0	1448				1641	3359	0	0	3359	1460
Grp Volume(v), veh/h	157	0	78				143	1222	0	0	765	54
Grp Sat Flow(s),veh/h/ln	1628	0	1448				1641	1637	0	0	1637	1460
Q Serve(g_s), s	4.3	0.0	2.3				1.9	11.0	0.0	0.0	7.9	1.0
Cycle Q Clear(g_c), s	4.3	0.0	2.3				1.9	11.0	0.0	0.0	7.9	1.0
Prop In Lane	1.00		1.00				1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h	257	0	228				494	2000	0	0	1501	669
V/C Ratio(X)	0.61	0.00	0.34				0.29	0.61	0.00	0.00	0.51	0.08
Avail Cap(c_a), veh/h	1027	0	914				1038	2410	0	0	2410	1075
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	18.7	0.0	17.8				5.7	5.7	0.0	0.0	9.1	7.2
Incr Delay (d2), s/veh	2.4	0.0	0.9				0.1	0.4	0.0	0.0	0.4	0.1
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 BackOfQ(90%),veh/ln	2.9	0.0	1.4				0.7	3.8	0.0	0.0	4.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.0	0.0	18.7				5.8	6.2	0.0	0.0	9.5	7.3
LnGrp LOS	C	A	B				A	A	A	A	A	A
Approach Vol, veh/h		235						1365			819	
Approach Delay, s/veh		20.2						6.2			9.3	
Approach LOS		C						A			A	

Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	7.2	27.3				34.5		13.0				
Change Period (Y+Rc), s	3.0	5.5				5.5		5.5				
Max Green Setting (Gmax), s	20.0	35.0				35.0		30.0				
Max Q Clear Time (g_c+I1), s	3.9	9.9				13.0		6.3				
Green Ext Time (p_c), s	0.2	9.4				16.0		1.6				

Intersection Summary	
HCM 6th Ctrl Delay	8.6
HCM 6th LOS	A

Notes

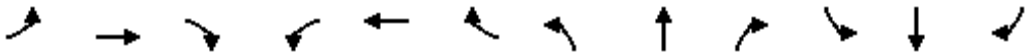
User approved pedestrian interval to be less than phase max green.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	47	12	113	26	0	0	0	0	54	1453	17
Future Volume (veh/h)	0	47	12	113	26	0	0	0	0	54	1453	17
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
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1559	1559	1600	1600	0				1723	1723	1723
Adj Flow Rate, veh/h	0	55	14	133	31	0				64	1709	20
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85				0.85	0.85	0.85
Percent Heavy Veh, %	0	14	14	11	11	0				2	2	2
Cap, veh/h	0	296	75	381	394	0				69	1918	24
Arrive On Green	0.00	0.25	0.25	0.25	0.25	0.00				0.59	0.59	0.59
Sat Flow, veh/h	0	1199	305	1237	1600	0				117	3275	40
Grp Volume(v), veh/h	0	0	69	133	31	0				939	0	854
Grp Sat Flow(s),veh/h/ln	0	0	1504	1237	1600	0				1717	0	1715
Q Serve(g_s), s	0.0	0.0	2.2	5.7	0.9	0.0				29.8	0.0	24.5
Cycle Q Clear(g_c), s	0.0	0.0	2.2	7.8	0.9	0.0				29.8	0.0	24.5
Prop In Lane	0.00		0.20	1.00		0.00				0.07		0.02
Lane Grp Cap(c), veh/h	0	0	371	381	394	0				1005	0	1005
V/C Ratio(X)	0.00	0.00	0.19	0.35	0.08	0.00				0.93	0.00	0.85
Avail Cap(c_a), veh/h	0	0	884	803	940	0				1009	0	1008
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	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	17.7	20.8	17.2	0.0				11.3	0.0	10.2
Incr Delay (d2), s/veh	0.0	0.0	0.5	1.2	0.2	0.0				15.4	0.0	7.6
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 BackOfQ(90%),veh/ln	0.0	0.0	1.4	3.0	0.6	0.0				17.0	0.0	12.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	18.2	22.0	17.4	0.0				26.7	0.0	17.8
LnGrp LOS	A	A	B	C	B	A				C	A	B
Approach Vol, veh/h		69			164						1793	
Approach Delay, s/veh		18.2			21.1						22.5	
Approach LOS		B			C						C	

Timer - Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				19.7		39.9		19.7				
Change Period (Y+Rc), s				5.0		5.0		5.0				
Max Green Setting (Gmax), s				35.0		35.0		35.0				
Max Q Clear Time (g_c+I1), s				4.2		31.8		9.8				
Green Ext Time (p_c), s				0.7		3.1		1.3				

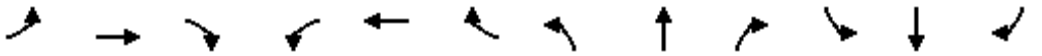
Intersection Summary												
HCM 6th Ctrl Delay			22.2									
HCM 6th LOS			C									



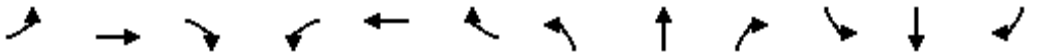
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	58	16	144	24	0	0	0	0	69	862	10
Future Volume (veh/h)	0	58	16	144	24	0	0	0	0	69	862	10
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1682	1682	1668	1668	0				1709	1709	1709
Adj Flow Rate, veh/h	0	61	17	152	25	0				73	907	11
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	5	5	6	6	0				3	3	3
Cap, veh/h	0	374	104	478	493	0				120	1565	20
Arrive On Green	0.00	0.30	0.30	0.30	0.30	0.00				0.50	0.50	0.50
Sat Flow, veh/h	0	1266	353	1279	1668	0				239	3120	40
Grp Volume(v), veh/h	0	0	78	152	25	0				518	0	473
Grp Sat Flow(s),veh/h/ln	0	0	1618	1279	1668	0				1697	0	1702
Q Serve(g_s), s	0.0	0.0	1.8	4.9	0.5	0.0				10.8	0.0	9.4
Cycle Q Clear(g_c), s	0.0	0.0	1.8	6.7	0.5	0.0				10.8	0.0	9.4
Prop In Lane	0.00		0.22	1.00		0.00				0.14		0.02
Lane Grp Cap(c), veh/h	0	0	478	478	493	0				851	0	854
V/C Ratio(X)	0.00	0.00	0.16	0.32	0.05	0.00				0.61	0.00	0.55
Avail Cap(c_a), veh/h	0	0	1150	1010	1186	0				1206	0	1210
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	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	12.8	15.3	12.4	0.0				8.8	0.0	8.5
Incr Delay (d2), s/veh	0.0	0.0	0.3	0.8	0.1	0.0				1.5	0.0	1.2
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 BackOfQ(90%),veh/ln	0.0	0.0	1.1	2.5	0.3	0.0				5.6	0.0	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	13.2	16.1	12.5	0.0				10.3	0.0	9.7
LnGrp LOS	A	A	B	B	B	A				B	A	A
Approach Vol, veh/h		78			177						991	
Approach Delay, s/veh		13.2			15.6						10.0	
Approach LOS		B			B						B	

Timer - Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				19.5		29.7		19.5				
Change Period (Y+Rc), s				5.0		5.0		5.0				
Max Green Setting (Gmax), s				35.0		35.0		35.0				
Max Q Clear Time (g_c+I1), s				3.8		12.8		8.7				
Green Ext Time (p_c), s				0.8		11.9		1.4				

Intersection Summary												
HCM 6th Ctrl Delay			11.0									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	70	0	0	124	69	13	540	76	0	0	0
Future Volume (veh/h)	30	70	0	0	124	69	13	540	76	0	0	0
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			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1668	1668	0	0	1709	1709	1695	1695	1695			
Adj Flow Rate, veh/h	35	82	0	0	146	81	15	635	89			
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85			
Percent Heavy Veh, %	6	6	0	0	3	3	4	4	4			
Cap, veh/h	349	344	0	0	424	223	34	1498	222			
Arrive On Green	0.21	0.21	0.00	0.00	0.21	0.21	0.53	0.53	0.53			
Sat Flow, veh/h	1117	1668	0	0	2143	1081	64	2829	419			
Grp Volume(v), veh/h	35	82	0	0	114	113	394	0	345			
Grp Sat Flow(s),veh/h/ln	1117	1668	0	0	1624	1514	1692	0	1620			
Q Serve(g_s), s	1.0	1.6	0.0	0.0	2.3	2.4	5.4	0.0	4.8			
Cycle Q Clear(g_c), s	3.5	1.6	0.0	0.0	2.3	2.4	5.4	0.0	4.8			
Prop In Lane	1.00		0.00	0.00		0.71	0.04		0.26			
Lane Grp Cap(c), veh/h	349	344	0	0	334	312	896	0	858			
V/C Ratio(X)	0.10	0.24	0.00	0.00	0.34	0.36	0.44	0.00	0.40			
Avail Cap(c_a), veh/h	1301	1766	0	0	1719	1603	2687	0	2573			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	14.4	12.5	0.0	0.0	12.8	12.9	5.5	0.0	5.3			
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.2	0.3	0.3	0.0	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 BackOfQ(90%),veh/ln	0.4	0.9	0.0	0.0	1.3	1.3	2.0	0.0	1.7			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.4	12.7	0.0	0.0	13.0	13.1	5.8	0.0	5.6			
LnGrp LOS	B	B	A	A	B	B	A	A	A			
Approach Vol, veh/h		117			227			739				
Approach Delay, s/veh		13.2			13.1			5.7				
Approach LOS		B			B			A				
Timer - Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		25.0		12.8				12.8				
Change Period (Y+Rc), s		5.0		5.0				5.0				
Max Green Setting (Gmax), s		60.0		40.0				40.0				
Max Q Clear Time (g_c+I1), s		7.4		5.5				4.4				
Green Ext Time (p_c), s		10.3		0.5				1.7				
Intersection Summary												
HCM 6th Ctrl Delay			8.1									
HCM 6th LOS			A									

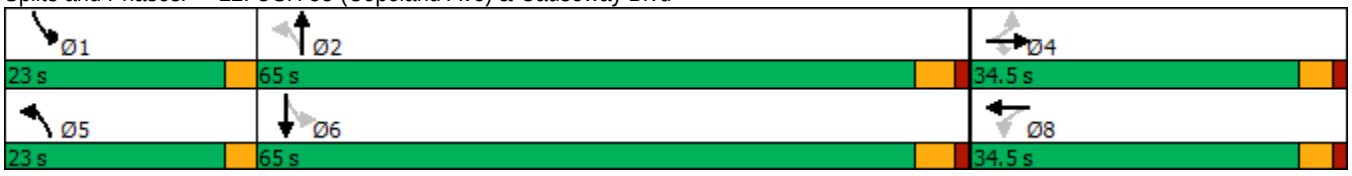


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	89	0	0	160	98	12	1321	150	0	0	0
Future Volume (veh/h)	47	89	0	0	160	98	12	1321	150	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1682	1682	0	0	1682	1682	1723	1723	1723			
Adj Flow Rate, veh/h	48	92	0	0	165	101	12	1362	155			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	5	5	0	0	5	5	2	2	2			
Cap, veh/h	194	274	0	0	318	184	18	2066	247			
Arrive On Green	0.16	0.16	0.00	0.00	0.16	0.16	0.69	0.69	0.69			
Sat Flow, veh/h	1087	1682	0	0	2031	1129	25	2997	358			
Grp Volume(v), veh/h	48	92	0	0	134	132	810	0	719			
Grp Sat Flow(s),veh/h/ln	1087	1682	0	0	1598	1478	1721	0	1658			
Q Serve(g_s), s	2.9	3.3	0.0	0.0	5.2	5.6	18.7	0.0	16.1			
Cycle Q Clear(g_c), s	8.5	3.3	0.0	0.0	5.2	5.6	18.7	0.0	16.1			
Prop In Lane	1.00		0.00	0.00		0.76	0.01		0.22			
Lane Grp Cap(c), veh/h	194	274	0	0	261	241	1187	0	1143			
V/C Ratio(X)	0.25	0.34	0.00	0.00	0.51	0.55	0.68	0.00	0.63			
Avail Cap(c_a), veh/h	657	991	0	0	942	872	1522	0	1466			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	30.0	25.1	0.0	0.0	25.9	26.1	6.2	0.0	5.8			
Incr Delay (d2), s/veh	0.2	0.3	0.0	0.0	0.6	0.7	0.9	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 BackOfQ(90%),veh/ln	1.3	2.3	0.0	0.0	3.5	3.5	7.6	0.0	6.5			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.2	25.4	0.0	0.0	26.5	26.8	7.0	0.0	6.3			
LnGrp LOS	C	C	A	A	C	C	A	A	A			
Approach Vol, veh/h		140			266			1529				
Approach Delay, s/veh		27.1			26.7			6.7				
Approach LOS		C			C			A				
Timer - Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		51.8		16.1				16.1				
Change Period (Y+Rc), s		5.0		5.0				5.0				
Max Green Setting (Gmax), s		60.0		40.0				40.0				
Max Q Clear Time (g_c+I1), s		20.7		10.5				7.6				
Green Ext Time (p_c), s		26.1		0.6				1.9				
Intersection Summary												
HCM 6th Ctrl Delay			10.9									
HCM 6th LOS			B									

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	3	66	3	1	3	93	600	3	8	1460	29
Future Volume (vph)	30	3	66	3	1	3	93	600	3	8	1460	29
Satd. Flow (prot)	0	1442	1282	0	1614	0	1425	3191	0	1453	3246	0
Flt Permitted		0.747			0.912		0.080			0.394		
Satd. Flow (perm)	0	1127	1282	0	1503	0	120	3191	0	602	3246	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	37	46	0	7	0	104	677	0	9	1673	0
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Total Split (s)	34.5	34.5	34.5	34.5	34.5		23.0	65.0		23.0	65.0	
Total Lost Time (s)		4.5	4.5		4.5		3.0	5.0		3.0	5.0	
Act Effct Green (s)		13.4	13.4		13.4		80.0	77.6		71.7	64.0	
Actuated g/C Ratio		0.14	0.14		0.14		0.82	0.79		0.73	0.65	
v/c Ratio		0.24	0.26		0.03		0.43	0.27		0.02	0.79	
Control Delay		41.6	41.6		36.5		14.5	5.3		4.6	19.1	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		41.6	41.6		36.5		14.5	5.3		4.6	19.1	
LOS		D	D		D		B	A		A	B	
Approach Delay		41.6			36.5			6.5			19.1	
Approach LOS		D			D			A			B	
Queue Length 50th (ft)		20	25		4		9	42		1	337	
Queue Length 95th (ft)		52	60		17		71	169		7	#857	
Internal Link Dist (ft)		294			130			398			385	
Turn Bay Length (ft)							100			100		
Base Capacity (vph)		349	397		466		368	2531		667	2123	
Starvation Cap Reductn		0	0		0		0	0		0	0	
Spillback Cap Reductn		0	0		0		0	0		0	0	
Storage Cap Reductn		0	0		0		0	0		0	0	
Reduced v/c Ratio		0.11	0.12		0.02		0.28	0.27		0.01	0.79	

Intersection Summary			
Cycle Length: 122.5			
Actuated Cycle Length: 97.8			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 16.0		Intersection LOS: B	
Intersection Capacity Utilization 72.8%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

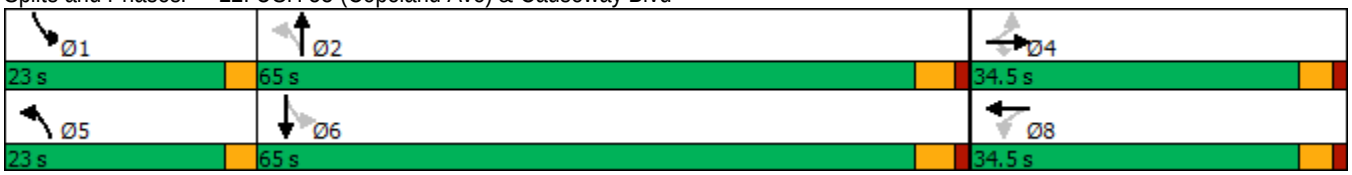
Splits and Phases: 22: USH 53 (Copeland Ave) & Causeway Blvd

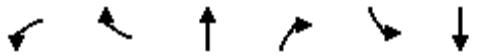


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	3	98	7	1	7	53	1392	4	0	963	29
Future Volume (vph)	73	3	98	7	1	7	53	1392	4	0	963	29
Satd. Flow (prot)	0	1605	1430	0	1624	0	1481	3320	0	1529	3243	0
Flt Permitted		0.730			0.878		0.201					
Satd. Flow (perm)	0	1228	1430	0	1467	0	313	3320	0	1529	3243	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	78	101	0	12	0	55	1439	0	0	1023	0
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Total Split (s)	34.5	34.5	34.5	34.5	34.5		23.0	65.0		23.0	65.0	
Total Lost Time (s)		4.5	4.5		4.5		3.0	5.0		3.0	5.0	
Act Effct Green (s)		13.5	13.5		13.5		44.3	42.2			36.0	
Actuated g/C Ratio		0.21	0.21		0.21		0.68	0.64			0.55	
v/c Ratio		0.31	0.34		0.04		0.16	0.67			0.58	
Control Delay		26.3	26.3		22.3		6.0	10.3			13.6	
Queue Delay		0.0	0.0		0.0		0.0	0.0			0.0	
Total Delay		26.3	26.3		22.3		6.0	10.3			13.6	
LOS		C	C		C		A	B			B	
Approach Delay		26.3			22.3			10.2			13.6	
Approach LOS		C			C			B			B	
Queue Length 50th (ft)		25	33		4		5	125			130	
Queue Length 95th (ft)		71	87		18		28	397			320	
Internal Link Dist (ft)		294			130			398			385	
Turn Bay Length (ft)							100					
Base Capacity (vph)		588	685		703		584	3040			2970	
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		0.13	0.15		0.02		0.09	0.47			0.34	

Intersection Summary	
Cycle Length: 122.5	
Actuated Cycle Length: 65.6	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 12.6	Intersection LOS: B
Intersection Capacity Utilization 64.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 22: USH 53 (Copeland Ave) & Causeway Blvd





Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	34	18	673	5	50	1474
Future Volume (veh/h)	34	18	673	5	50	1474
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1641	1641	1682	1682	1709	1724
Adj Flow Rate, veh/h	39	13	774	6	57	1694
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	8	8	5	5	3	3
Cap, veh/h	238	211	1475	11	507	2152
Arrive On Green	0.15	0.15	0.45	0.45	0.11	0.66
Sat Flow, veh/h	1563	1391	3334	25	1628	3361
Grp Volume(v), veh/h	39	13	381	399	57	1694
Grp Sat Flow(s),veh/h/ln	1563	1391	1598	1677	1628	1638
Q Serve(g_s), s	1.1	0.4	8.9	8.9	0.8	19.2
Cycle Q Clear(g_c), s	1.1	0.4	8.9	8.9	0.8	19.2
Prop In Lane	1.00	1.00		0.02	1.00	
Lane Grp Cap(c), veh/h	238	211	725	761	507	2152
V/C Ratio(X)	0.16	0.06	0.52	0.52	0.11	0.79
Avail Cap(c_a), veh/h	746	664	1068	1121	1109	2189
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.3	19.0	10.2	10.2	5.6	6.4
Incr Delay (d2), s/veh	0.7	0.3	1.3	1.2	0.1	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	0.8	0.3	4.9	5.1	0.3	7.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.0	19.3	11.5	11.4	5.7	8.7
LnGrp LOS	B	B	B	B	A	A
Approach Vol, veh/h	52		780			1751
Approach Delay, s/veh	19.8		11.5			8.6
Approach LOS	B		B			A

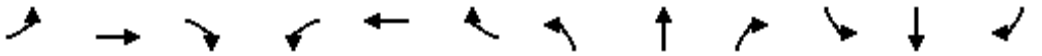
Timer - Assigned Phs		2			5	6	8
Phs Duration (G+Y+Rc), s		39.4			10.6	28.8	13.0
Change Period (Y+Rc), s		5.0			5.0	5.0	5.0
Max Green Setting (Gmax), s		35.0			25.0	35.0	25.0
Max Q Clear Time (g_c+I1), s		21.2			2.8	10.9	3.1
Green Ext Time (p_c), s		13.2			0.2	12.8	0.2

Intersection Summary	
HCM 6th Ctrl Delay	9.7
HCM 6th LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	193	128	1300	21	107	922
Future Volume (veh/h)	193	128	1300	21	107	922
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1750	1750	1736	1736	1723	1737
Adj Flow Rate, veh/h	195	80	1313	21	108	931
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	0	1	1	2	2
Cap, veh/h	340	303	1560	25	348	2176
Arrive On Green	0.20	0.20	0.47	0.47	0.12	0.66
Sat Flow, veh/h	1667	1483	3410	53	1641	3388
Grp Volume(v), veh/h	195	80	651	683	108	931
Grp Sat Flow(s),veh/h/ln	1667	1483	1650	1727	1641	1651
Q Serve(g_s), s	7.7	3.3	25.3	25.4	2.0	9.8
Cycle Q Clear(g_c), s	7.7	3.3	25.3	25.4	2.0	9.8
Prop In Lane	1.00	1.00		0.03	1.00	
Lane Grp Cap(c), veh/h	340	303	774	811	348	2176
V/C Ratio(X)	0.57	0.26	0.84	0.84	0.31	0.43
Avail Cap(c_a), veh/h	569	507	789	826	709	2176
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.2	24.5	17.0	17.0	12.6	5.9
Incr Delay (d2), s/veh	3.2	1.0	8.9	8.6	0.7	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	5.5	2.2	14.6	15.1	1.4	4.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	29.5	25.5	25.9	25.6	13.4	6.2
LnGrp LOS	C	C	C	C	B	A
Approach Vol, veh/h	275		1334			1039
Approach Delay, s/veh	28.3		25.8			7.0
Approach LOS	C		C			A

Timer - Assigned Phs		2			5	6	8
Phs Duration (G+Y+Rc), s		53.2			13.9	39.4	19.9
Change Period (Y+Rc), s		5.0			5.0	5.0	5.0
Max Green Setting (Gmax), s		35.0			25.0	35.0	25.0
Max Q Clear Time (g_c+I1), s		11.8			4.0	27.4	9.7
Green Ext Time (p_c), s		15.2			0.5	7.0	1.7

Intersection Summary	
HCM 6th Ctrl Delay	18.7
HCM 6th LOS	B



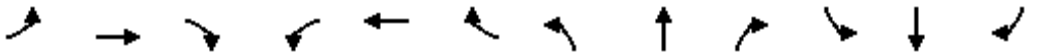
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	213	0	75	4	0	0	136	1141	1	4	1217	455
Future Volume (veh/h)	213	0	75	4	0	0	136	1141	1	4	1217	455
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1695	1695	1763	1750	1750	1750	1723	1723	1723	1709	1816	1709
Adj Flow Rate, veh/h	234	0	51	4	0	0	149	1254	1	4	1337	310
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	4	4	4	0	0	0	2	2	2	3	3	3
Cap, veh/h	385	0	178	9	0	0	279	2231	2	288	2123	1064
Arrive On Green	0.12	0.00	0.12	0.01	0.00	0.00	0.05	0.66	0.66	0.01	0.62	0.62
Sat Flow, veh/h	3229	0	1494	1667	0	0	1641	3356	3	1628	3451	1448
Grp Volume(v), veh/h	234	0	51	4	0	0	149	611	644	4	1337	310
Grp Sat Flow(s),veh/h/ln	1615	0	1494	1667	0	0	1641	1637	1722	1628	1726	1448
Q Serve(g_s), s	6.5	0.0	3.0	0.2	0.0	0.0	2.9	19.0	19.0	0.1	23.1	6.9
Cycle Q Clear(g_c), s	6.5	0.0	3.0	0.2	0.0	0.0	2.9	19.0	19.0	0.1	23.1	6.9
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	385	0	178	9	0	0	279	1088	1145	288	2123	1064
V/C Ratio(X)	0.61	0.00	0.29	0.46	0.00	0.00	0.53	0.56	0.56	0.01	0.63	0.29
Avail Cap(c_a), veh/h	1362	0	630	527	0	0	535	1088	1145	623	2184	1089
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.7	0.0	38.1	47.0	0.0	0.0	11.5	8.5	8.5	7.9	11.5	4.3
Incr Delay (d2), s/veh	2.2	0.0	1.2	44.6	0.0	0.0	1.6	1.7	1.6	0.0	1.2	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	4.8	0.0	2.1	0.4	0.0	0.0	2.5	9.8	10.2	0.1	11.3	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.9	0.0	39.3	91.6	0.0	0.0	13.1	10.2	10.1	8.0	12.7	4.8
LnGrp LOS	D	A	D	F	A	A	B	B	B	A	B	A
Approach Vol, veh/h		285			4			1404			1651	
Approach Delay, s/veh		41.4			91.6			10.5			11.2	
Approach LOS		D			F			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.5	68.5		16.8	8.2	63.8		6.0				
Change Period (Y+Rc), s	3.0	5.5		5.5	3.0	5.5		5.5				
Max Green Setting (Gmax), s	20.0	60.0		40.0	20.0	60.0		30.0				
Max Q Clear Time (g_c+I1), s	2.1	21.0		8.5	4.9	25.1		2.2				
Green Ext Time (p_c), s	0.0	36.4		2.8	0.4	33.3		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	13.6
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.



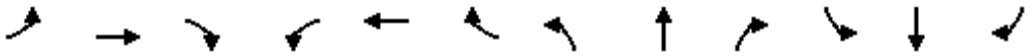
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	537	2	93	12	2	2	121	1261	5	4	1160	368
Future Volume (veh/h)	537	2	93	12	2	2	121	1261	5	4	1160	368
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1820	1750	1750	1750	1723	1723	1723	1736	1845	1736
Adj Flow Rate, veh/h	598	0	64	13	2	2	134	1401	6	4	1289	254
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	2	2	2	1	1	1
Cap, veh/h	795	0	368	23	4	4	234	1894	8	170	1810	1110
Arrive On Green	0.24	0.00	0.24	0.02	0.02	0.02	0.06	0.57	0.57	0.01	0.52	0.52
Sat Flow, veh/h	3333	0	1542	1263	194	194	1641	3342	14	1654	3506	1471
Grp Volume(v), veh/h	598	0	64	17	0	0	134	686	721	4	1289	254
Grp Sat Flow(s),veh/h/ln	1667	0	1542	1652	0	0	1641	1637	1720	1654	1753	1471
Q Serve(g_s), s	19.0	0.0	3.8	1.2	0.0	0.0	4.2	35.6	35.6	0.1	32.0	5.8
Cycle Q Clear(g_c), s	19.0	0.0	3.8	1.2	0.0	0.0	4.2	35.6	35.6	0.1	32.0	5.8
Prop In Lane	1.00		1.00	0.76		0.12	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	795	0	368	30	0	0	234	928	975	170	1810	1110
V/C Ratio(X)	0.75	0.00	0.17	0.56	0.00	0.00	0.57	0.74	0.74	0.02	0.71	0.23
Avail Cap(c_a), veh/h	1171	0	542	435	0	0	430	928	975	452	1848	1126
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.2	0.0	34.4	55.4	0.0	0.0	18.9	18.4	18.4	17.0	21.1	4.1
Incr Delay (d2), s/veh	2.2	0.0	0.3	21.4	0.0	0.0	2.2	4.7	4.5	0.1	2.1	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	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	11.7	0.0	2.6	1.2	0.0	0.0	3.0	19.1	19.9	0.1	17.3	6.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.4	0.0	34.8	76.8	0.0	0.0	21.1	23.1	22.9	17.1	23.2	4.5
LnGrp LOS	D	A	C	E	A	A	C	C	C	B	C	A
Approach Vol, veh/h		662			17			1541			1547	
Approach Delay, s/veh		41.7			76.8			22.8			20.1	
Approach LOS		D			E			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.6	70.0		32.6	9.4	64.3		7.6				
Change Period (Y+Rc), s	3.0	5.5		5.5	3.0	5.5		5.5				
Max Green Setting (Gmax), s	20.0	60.0		40.0	20.0	60.0		30.0				
Max Q Clear Time (g_c+I1), s	2.1	37.6		21.0	6.2	34.0		3.2				
Green Ext Time (p_c), s	0.0	21.9		6.2	0.3	24.7		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		25.3	
HCM 6th LOS		C	

Notes

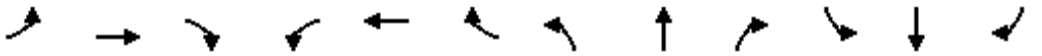
User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	229	34	68	450	12	15	14	11	4	27	7
Future Volume (veh/h)	10	229	34	68	450	12	15	14	11	4	27	7
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1695	1695	1695	1736	1736	1736	1641	1641	1641	1510	1510	1573
Adj Flow Rate, veh/h	12	286	42	85	562	15	19	18	9	5	34	9
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	4	4	4	1	1	1	8	8	8	13	13	13
Cap, veh/h	585	1063	156	799	1238	33	33	31	55	58	47	12
Arrive On Green	0.74	0.74	0.74	0.74	0.74	0.74	0.04	0.04	0.04	0.04	0.04	0.04
Sat Flow, veh/h	823	1445	212	1060	1683	45	821	778	1391	1438	1150	305
Grp Volume(v), veh/h	12	0	328	85	0	577	37	0	9	5	0	43
Grp Sat Flow(s),veh/h/ln	823	0	1657	1060	0	1728	1600	0	1391	1438	0	1455
Q Serve(g_s), s	0.5	0.0	5.3	2.3	0.0	10.8	1.9	0.0	0.5	0.3	0.0	2.4
Cycle Q Clear(g_c), s	11.3	0.0	5.3	7.7	0.0	10.8	1.9	0.0	0.5	0.3	0.0	2.4
Prop In Lane	1.00		0.13	1.00		0.03	0.51		1.00	1.00		0.21
Lane Grp Cap(c), veh/h	585	0	1219	799	0	1272	63	0	55	58	0	59
V/C Ratio(X)	0.02	0.00	0.27	0.11	0.00	0.45	0.58	0.00	0.16	0.09	0.00	0.73
Avail Cap(c_a), veh/h	635	0	1321	864	0	1378	687	0	597	529	0	535
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	6.5	0.0	3.6	4.8	0.0	4.3	38.5	0.0	37.8	37.7	0.0	38.7
Incr Delay (d2), s/veh	0.0	0.0	0.3	0.1	0.0	0.5	8.2	0.0	1.4	0.6	0.0	15.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	0.1	0.0	2.6	0.8	0.0	5.3	1.6	0.0	0.3	0.2	0.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.5	0.0	3.8	4.9	0.0	4.8	46.7	0.0	39.2	38.3	0.0	54.2
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	D
Approach Vol, veh/h		340			662			46			48	
Approach Delay, s/veh		3.9			4.8			45.2			52.6	
Approach LOS		A			A			D			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		65.0		8.2		65.0		8.3				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		65.0		35.0		65.0		30.0				
Max Q Clear Time (g_c+I1), s		13.3		3.9		12.8		4.4				
Green Ext Time (p_c), s		7.8		0.2		17.1		0.2				

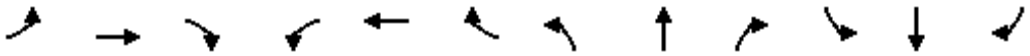
Intersection Summary												
HCM 6th Ctrl Delay			8.3									
HCM 6th LOS			A									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	493	45	25	444	3	84	3	73	9	10	15
Future Volume (veh/h)	10	493	45	25	444	3	84	3	73	9	10	15
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1736	1736	1736	1736	1736	1723	1723	1723	1680	1680	1750
Adj Flow Rate, veh/h	11	548	50	28	493	3	93	3	50	10	11	17
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	1	1	1	1	2	2	2	0	0	0
Cap, veh/h	587	1052	96	505	1157	7	145	5	133	58	22	34
Arrive On Green	0.67	0.67	0.67	0.67	0.67	0.67	0.09	0.09	0.09	0.04	0.04	0.04
Sat Flow, veh/h	909	1568	143	827	1724	10	1592	51	1460	1600	595	920
Grp Volume(v), veh/h	11	0	598	28	0	496	96	0	50	10	0	28
Grp Sat Flow(s),veh/h/ln	909	0	1711	827	0	1734	1643	0	1460	1600	0	1514
Q Serve(g_s), s	0.4	0.0	13.2	1.3	0.0	9.8	4.2	0.0	2.4	0.5	0.0	1.4
Cycle Q Clear(g_c), s	10.2	0.0	13.2	14.5	0.0	9.8	4.2	0.0	2.4	0.5	0.0	1.4
Prop In Lane	1.00		0.08	1.00		0.01	0.97		1.00	1.00		0.61
Lane Grp Cap(c), veh/h	587	0	1148	505	0	1164	150	0	133	58	0	55
V/C Ratio(X)	0.02	0.00	0.52	0.06	0.00	0.43	0.64	0.00	0.38	0.17	0.00	0.51
Avail Cap(c_a), veh/h	770	0	1492	672	0	1513	772	0	686	644	0	610
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.0	0.0	6.2	9.9	0.0	5.6	32.7	0.0	31.9	34.8	0.0	35.2
Incr Delay (d2), s/veh	0.0	0.0	0.8	0.1	0.0	0.5	4.5	0.0	1.8	1.4	0.0	7.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	0.1	0.0	6.7	0.4	0.0	5.3	3.3	0.0	1.6	0.4	0.0	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.0	0.0	7.0	10.0	0.0	6.2	37.2	0.0	33.6	36.2	0.0	42.2
LnGrp LOS	A	A	A	A	A	A	D	A	C	D	A	D
Approach Vol, veh/h		609			524			146			38	
Approach Delay, s/veh		7.0			6.4			36.0			40.6	
Approach LOS		A			A			D			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		55.0		11.8		55.0		7.7				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		65.0		35.0		65.0		30.0				
Max Q Clear Time (g_c+I1), s		15.2		6.2		16.5		3.4				
Green Ext Time (p_c), s		16.7		0.9		13.1		0.2				

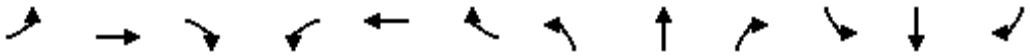
Intersection Summary												
HCM 6th Ctrl Delay			10.9									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	66	188	49	128	196	85	92	684	101	102	764	127
Future Volume (veh/h)	66	188	49	128	196	85	92	684	101	102	764	127
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1709	1709	1777	1723	1723	1723	1709	1709	1777	1709	1709	1777
Adj Flow Rate, veh/h	75	214	56	145	223	60	105	777	115	116	868	144
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	2	2	2	3	3	3	3	3	3
Cap, veh/h	243	307	79	294	319	270	339	1446	214	381	1424	236
Arrive On Green	0.05	0.14	0.14	0.09	0.19	0.19	0.06	0.51	0.51	0.06	0.51	0.51
Sat Flow, veh/h	1628	2136	550	1641	1723	1460	1628	2837	420	1628	2787	462
Grp Volume(v), veh/h	75	106	164	145	223	60	105	445	447	116	506	506
Grp Sat Flow(s),veh/h/ln	1628	1077	1610	1641	1723	1460	1628	1624	1633	1628	1624	1626
Q Serve(g_s), s	3.2	7.7	7.9	5.8	9.9	2.9	2.4	15.1	15.1	2.7	18.1	18.1
Cycle Q Clear(g_c), s	3.2	7.7	7.9	5.8	9.9	2.9	2.4	15.1	15.1	2.7	18.1	18.1
Prop In Lane	1.00		0.34	1.00		1.00	1.00		0.26	1.00		0.28
Lane Grp Cap(c), veh/h	243	155	231	294	319	270	339	827	832	381	829	830
V/C Ratio(X)	0.31	0.69	0.71	0.49	0.70	0.22	0.31	0.54	0.54	0.30	0.61	0.61
Avail Cap(c_a), veh/h	756	791	1183	743	1055	894	647	1293	1301	688	1293	1294
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.9	33.2	33.3	25.1	31.1	28.3	10.7	13.5	13.5	10.0	14.2	14.2
Incr Delay (d2), s/veh	0.3	2.0	1.5	0.5	1.0	0.2	0.2	0.9	0.9	0.2	1.2	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	2.2	3.7	5.4	4.1	6.7	1.8	1.5	8.4	8.4	1.5	9.3	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.2	35.2	34.8	25.5	32.2	28.4	10.9	14.4	14.4	10.2	15.4	15.4
LnGrp LOS	C	D	C	C	C	C	B	B	B	B	B	B
Approach Vol, veh/h		345			428			997			1128	
Approach Delay, s/veh		33.5			29.4			14.0			14.8	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.6	46.6	10.7	16.7	7.5	46.7	7.3	20.1
Change Period (Y+Rc), s	3.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0
Max Green Setting (Gmax), s	20.0	65.0	30.0	60.0	20.0	65.0	30.0	50.0
Max Q Clear Time (g_c+I1), s	4.7	17.1	7.8	9.9	4.4	20.1	5.2	11.9
Green Ext Time (p_c), s	0.1	20.8	0.1	1.8	0.1	21.6	0.1	1.5

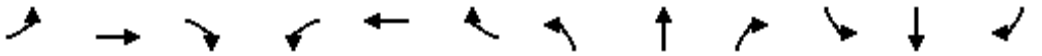
Intersection Summary	
HCM 6th Ctrl Delay	18.9
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	255	335	126	196	293	110	182	990	159	99	662	83
Future Volume (veh/h)	255	335	126	196	293	110	182	990	159	99	662	83
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1820	1709	1709	1709	1723	1723	1792	1750	1750	1820
Adj Flow Rate, veh/h	260	342	129	200	299	70	186	1010	162	101	676	85
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	3	3	3	2	2	2	0	0	0
Cap, veh/h	324	465	173	309	346	293	388	1350	216	231	1336	168
Arrive On Green	0.14	0.23	0.23	0.11	0.20	0.20	0.08	0.48	0.48	0.05	0.45	0.45
Sat Flow, veh/h	1667	2054	765	1628	1709	1448	1641	2825	453	1667	2972	373
Grp Volume(v), veh/h	260	199	272	200	299	70	186	585	587	101	378	383
Grp Sat Flow(s),veh/h/ln	1667	1208	1612	1628	1709	1448	1641	1637	1641	1667	1663	1683
Q Serve(g_s), s	14.2	18.3	18.8	11.5	20.2	4.8	7.0	34.7	34.8	3.9	19.4	19.4
Cycle Q Clear(g_c), s	14.2	18.3	18.8	11.5	20.2	4.8	7.0	34.7	34.8	3.9	19.4	19.4
Prop In Lane	1.00		0.47	1.00		1.00	1.00		0.28	1.00		0.22
Lane Grp Cap(c), veh/h	324	273	365	309	346	293	388	782	784	231	748	757
V/C Ratio(X)	0.80	0.73	0.74	0.65	0.86	0.24	0.48	0.75	0.75	0.44	0.51	0.51
Avail Cap(c_a), veh/h	512	606	808	532	714	605	537	889	892	430	903	914
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.0	42.9	43.1	33.2	46.1	40.0	16.7	25.4	25.4	21.3	23.4	23.5
Incr Delay (d2), s/veh	2.1	1.4	1.1	0.8	2.5	0.2	0.3	3.7	3.7	0.5	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	9.1	8.6	11.2	7.4	12.7	3.2	4.7	19.0	19.1	2.8	11.4	11.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.1	44.3	44.2	34.1	48.7	40.1	17.1	29.1	29.1	21.8	24.3	24.3
LnGrp LOS	C	D	D	C	D	D	B	C	C	C	C	C
Approach Vol, veh/h		731			569			1358			862	
Approach Delay, s/veh		40.6			42.5			27.4			24.0	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.8	62.2	16.6	32.1	12.1	58.8	19.5	29.2
Change Period (Y+Rc), s	3.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0
Max Green Setting (Gmax), s	20.0	65.0	30.0	60.0	20.0	65.0	30.0	50.0
Max Q Clear Time (g_c+I1), s	5.9	36.8	13.5	20.8	9.0	21.4	16.2	22.2
Green Ext Time (p_c), s	0.1	20.4	0.2	3.3	0.2	16.2	0.3	2.0

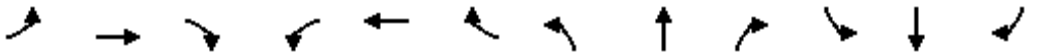
Intersection Summary	
HCM 6th Ctrl Delay	31.8
HCM 6th LOS	C



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	24	12	127	18	152	9	591	50	209	1216	7
Future Volume (veh/h)	94	24	12	127	18	152	9	591	50	209	1216	7
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1514	1514	1514	1563	1563	1563	1514	1514	1514	1526	1539	1526
Adj Flow Rate, veh/h	109	28	14	148	21	110	10	687	58	243	1414	8
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	5	5	5	1	1	1	5	5	5	4	4	4
Cap, veh/h	274	77	39	289	156	133	17	1194	101	268	1865	11
Arrive On Green	0.08	0.08	0.08	0.11	0.10	0.10	0.01	0.44	0.44	0.18	0.63	0.63
Sat Flow, veh/h	1441	952	476	1488	1563	1324	1441	2684	226	1453	2981	17
Grp Volume(v), veh/h	109	0	42	148	21	110	10	368	377	243	693	729
Grp Sat Flow(s),veh/h/ln	1441	0	1428	1488	1563	1324	1441	1438	1473	1453	1462	1536
Q Serve(g_s), s	7.9	0.0	3.2	10.3	1.4	9.4	0.8	22.0	22.0	18.9	38.9	39.0
Cycle Q Clear(g_c), s	7.9	0.0	3.2	10.3	1.4	9.4	0.8	22.0	22.0	18.9	38.9	39.0
Prop In Lane	1.00		0.33	1.00		1.00	1.00		0.15	1.00		0.01
Lane Grp Cap(c), veh/h	274	0	116	289	156	133	17	639	655	268	915	961
V/C Ratio(X)	0.40	0.00	0.36	0.51	0.13	0.83	0.58	0.58	0.58	0.91	0.76	0.76
Avail Cap(c_a), veh/h	527	0	427	393	332	281	200	923	946	441	1192	1253
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.4	0.0	50.1	42.1	47.3	50.9	56.7	23.9	23.9	46.1	15.4	15.4
Incr Delay (d2), s/veh	0.7	0.0	0.7	1.4	0.1	5.0	11.1	0.7	0.7	10.8	1.9	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	5.1	0.0	2.1	6.5	1.0	5.7	0.6	11.1	11.4	11.1	17.0	17.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.1	0.0	50.8	43.5	47.4	55.9	67.8	24.6	24.6	56.9	17.3	17.2
LnGrp LOS	D	A	D	D	D	E	E	C	C	E	B	B
Approach Vol, veh/h		151			279			755			1665	
Approach Delay, s/veh		46.0			48.7			25.2			23.0	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.4	78.1	14.7	17.0	26.2	57.3	16.9	14.9
Change Period (Y+Rc), s	4.0	6.0	5.0	5.5	5.0	6.0	4.5	5.5
Max Green Setting (Gmax), s	16.0	94.0	30.0	24.5	35.0	74.0	20.5	34.5
Max Q Clear Time (g_c+I1), s	2.8	41.0	9.9	11.4	20.9	24.0	12.3	5.2
Green Ext Time (p_c), s	0.0	31.1	0.2	0.1	0.4	12.8	0.2	0.1

Intersection Summary	
HCM 6th Ctrl Delay	27.3
HCM 6th LOS	C



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	336	85	6	126	45	359	19	1079	69	265	816	5
Future Volume (veh/h)	336	85	6	126	45	359	19	1079	69	265	816	5
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1575	1575	1575	1575	1575	1563	1563	1563	1550	1550	1550
Adj Flow Rate, veh/h	343	87	6	129	46	227	19	1101	70	270	833	5
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	2	2	2
Cap, veh/h	390	310	21	324	209	177	25	1132	72	280	1733	10
Arrive On Green	0.16	0.21	0.21	0.09	0.13	0.13	0.02	0.40	0.40	0.19	0.58	0.58
Sat Flow, veh/h	1500	1456	100	1500	1575	1335	1488	2835	180	1477	3002	18
Grp Volume(v), veh/h	343	0	93	129	46	227	19	576	595	270	409	429
Grp Sat Flow(s),veh/h/ln	1500	0	1557	1500	1575	1335	1488	1485	1530	1477	1473	1547
Q Serve(g_s), s	30.0	0.0	9.2	13.6	4.8	24.5	2.3	70.4	70.5	33.5	30.0	30.0
Cycle Q Clear(g_c), s	30.0	0.0	9.2	13.6	4.8	24.5	2.3	70.4	70.5	33.5	30.0	30.0
Prop In Lane	1.00		0.06	1.00		1.00	1.00		0.12	1.00		0.01
Lane Grp Cap(c), veh/h	390	0	331	324	209	177	25	593	611	280	850	893
V/C Ratio(X)	0.88	0.00	0.28	0.40	0.22	1.28	0.76	0.97	0.97	0.97	0.48	0.48
Avail Cap(c_a), veh/h	390	0	331	363	209	177	129	594	613	280	850	893
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.9	0.0	60.9	61.9	71.6	80.2	90.5	54.5	54.5	74.3	22.8	22.8
Incr Delay (d2), s/veh	19.7	0.0	0.2	0.8	0.2	163.3	15.7	29.8	29.5	44.1	0.4	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	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	8.7	0.0	6.2	8.3	3.6	24.1	1.9	38.6	39.7	21.4	14.9	15.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	79.5	0.0	61.1	62.7	71.8	243.4	106.1	84.3	84.0	118.4	23.2	23.2
LnGrp LOS	E	A	E	E	E	F	F	F	F	F	C	C
Approach Vol, veh/h		436			402			1190			1108	
Approach Delay, s/veh		75.6			165.8			84.5			46.4	
Approach LOS		E			F			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.1	112.7	35.0	30.0	40.0	79.8	20.2	44.8
Change Period (Y+Rc), s	4.0	6.0	5.0	5.5	5.0	6.0	4.5	5.5
Max Green Setting (Gmax), s	16.0	94.0	30.0	24.5	35.0	74.0	20.5	34.5
Max Q Clear Time (g_c+I1), s	4.3	32.0	32.0	26.5	35.5	72.5	15.6	11.2
Green Ext Time (p_c), s	0.0	14.3	0.0	0.0	0.0	1.3	0.1	0.3

Intersection Summary	
HCM 6th Ctrl Delay	80.2
HCM 6th LOS	F

Intersection	
Intersection Delay, s/veh	10.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	132	154	78	149	21	164	15	103	5	0	0
Future Vol, veh/h	5	132	154	78	149	21	164	15	103	5	0	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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	143	167	85	162	23	178	16	112	5	0	0
Number of Lanes	0	1	1	0	2	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	10	10.6	11.4	9.9
HCM LOS	A	B	B	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	92%	0%	4%	0%	51%	0%	100%
Vol Thru, %	8%	0%	96%	0%	49%	78%	0%
Vol Right, %	0%	100%	0%	100%	0%	22%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	179	103	137	154	153	96	5
LT Vol	164	0	5	0	78	0	5
Through Vol	15	0	132	0	75	75	0
RT Vol	0	103	0	154	0	21	0
Lane Flow Rate	195	112	149	167	166	104	5
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.352	0.166	0.243	0.239	0.283	0.165	0.01
Departure Headway (Hd)	6.519	5.35	5.869	5.142	6.137	5.723	6.814
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	553	672	614	700	587	628	525
Service Time	4.246	3.076	3.594	2.867	3.862	3.448	4.854
HCM Lane V/C Ratio	0.353	0.167	0.243	0.239	0.283	0.166	0.01
HCM Control Delay	12.8	9.1	10.5	9.5	11.3	9.6	9.9
HCM Lane LOS	B	A	B	A	B	A	A
HCM 95th-tile Q	1.6	0.6	0.9	0.9	1.2	0.6	0

Intersection	
Intersection Delay, s/veh	16.5
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	273	105	99	293	8	220	2	182	30	33	19
Future Vol, veh/h	4	273	105	99	293	8	220	2	182	30	33	19
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	297	114	108	318	9	239	2	198	33	36	21
Number of Lanes	0	1	1	0	2	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	17.6	16.5	16.2	13.2
HCM LOS	C	C	C	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	99%	0%	1%	0%	40%	0%	37%
Vol Thru, %	1%	0%	99%	0%	60%	95%	40%
Vol Right, %	0%	100%	0%	100%	0%	5%	23%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	222	182	277	105	246	155	82
LT Vol	220	0	4	0	99	0	30
Through Vol	2	0	273	0	147	147	33
RT Vol	0	182	0	105	0	8	19
Lane Flow Rate	241	198	301	114	267	168	89
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.523	0.362	0.601	0.205	0.544	0.331	0.201
Departure Headway (Hd)	7.805	6.583	7.185	6.459	7.337	7.093	8.103
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	463	546	503	556	491	507	442
Service Time	5.545	4.323	4.928	4.202	5.081	4.837	6.161
HCM Lane V/C Ratio	0.521	0.363	0.598	0.205	0.544	0.331	0.201
HCM Control Delay	18.8	13	20.2	10.9	18.5	13.3	13.2
HCM Lane LOS	C	B	C	B	C	B	B
HCM 95th-tile Q	3	1.6	3.9	0.8	3.2	1.4	0.7

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	13	18	18	23	0	0	0	0	53	1087	11
Future Vol, veh/h	0	13	18	18	23	0	0	0	0	53	1087	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	14	20	20	25	0	0	0	0	58	1182	12

Major/Minor	Minor2			Minor1					Major2		
Conflicting Flow All	-	1304	597	714	1310	-			0	0	0
Stage 1	-	1304	-	0	0	-			-	-	-
Stage 2	-	0	-	714	1310	-			-	-	-
Critical Hdwy	-	6.54	6.94	7.54	6.54	-			4.14	-	-
Critical Hdwy Stg 1	-	5.54	-	-	-	-			-	-	-
Critical Hdwy Stg 2	-	-	-	6.54	5.54	-			-	-	-
Follow-up Hdwy	-	4.02	3.32	3.52	4.02	-			2.22	-	-
Pot Cap-1 Maneuver	0	159	446	319	158	0			-	-	-
Stage 1	0	229	-	-	-	0			-	-	-
Stage 2	0	-	-	388	227	0			-	-	-
Platoon blocked, %										-	-
Mov Cap-1 Maneuver	-	159	446	284	158	-			-	-	-
Mov Cap-2 Maneuver	-	159	-	284	158	-			-	-	-
Stage 1	-	229	-	-	-	-			-	-	-
Stage 2	-	-	-	348	227	-			-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	21.3	28.7	
HCM LOS	C	D	

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	254	196	-	-	-
HCM Lane V/C Ratio	0.133	0.227	-	-	-
HCM Control Delay (s)	21.3	28.7	-	-	-
HCM Lane LOS	C	D	-	-	-
HCM 95th %tile Q(veh)	0.5	0.8	-	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	16	36	23	15	0	0	0	0	19	941	16
Future Vol, veh/h	0	16	36	23	15	0	0	0	0	19	941	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	17	39	25	16	0	0	0	0	21	1023	17

Major/Minor	Minor2			Minor1					Major2		
Conflicting Flow All	-	1074	520	562	1082	-			0	0	0
Stage 1	-	1074	-	0	0	-			-	-	-
Stage 2	-	0	-	562	1082	-			-	-	-
Critical Hdwy	-	6.54	6.94	7.54	6.54	-			4.14	-	-
Critical Hdwy Stg 1	-	5.54	-	-	-	-			-	-	-
Critical Hdwy Stg 2	-	-	-	6.54	5.54	-			-	-	-
Follow-up Hdwy	-	4.02	3.32	3.52	4.02	-			2.22	-	-
Pot Cap-1 Maneuver	0	218	501	410	216	0			-	-	-
Stage 1	0	294	-	-	-	0			-	-	-
Stage 2	0	-	-	479	292	0			-	-	-
Platoon blocked, %										-	-
Mov Cap-1 Maneuver	-	218	501	355	216	-			-	-	-
Mov Cap-2 Maneuver	-	218	-	355	216	-			-	-	-
Stage 1	-	294	-	-	-	-			-	-	-
Stage 2	-	-	-	415	292	-			-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	16.9	19.9	
HCM LOS	C	C	

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	358	283	-	-	-
HCM Lane V/C Ratio	0.158	0.146	-	-	-
HCM Control Delay (s)	16.9	19.9	-	-	-
HCM Lane LOS	C	C	-	-	-
HCM 95th %tile Q(veh)	0.6	0.5	-	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	32	0	0	9	18	36	639	4	0	0	0
Future Vol, veh/h	18	32	0	0	9	18	36	639	4	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	70	-	70	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	1081	1936	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	20	35	0	0	10	20	39	695	4	0	0	0

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	431	777	-	-	773	348	0	0	0
Stage 1	0	0	-	-	773	-	-	-	-
Stage 2	431	777	-	-	0	-	-	-	-
Critical Hdwy	7.54	6.54	-	-	6.54	6.94	4.14	-	-
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	-	-	4.02	3.32	2.22	-	-
Pot Cap-1 Maneuver	508	327	0	0	328	648	-	-	-
Stage 1	-	-	0	0	407	-	-	-	-
Stage 2	573	405	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	482	327	-	-	328	648	-	-	-
Mov Cap-2 Maneuver	482	327	-	-	328	-	-	-	-
Stage 1	-	-	-	-	407	-	-	-	-
Stage 2	542	405	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	16.4	12.8	
HCM LOS	C	B	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	-	-	-	370	489
HCM Lane V/C Ratio	-	-	-	0.147	0.06
HCM Control Delay (s)	-	-	-	16.4	12.8
HCM Lane LOS	-	-	-	C	B
HCM 95th %tile Q(veh)	-	-	-	0.5	0.2

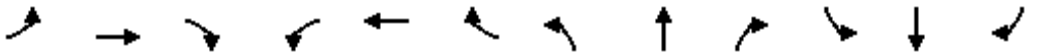
Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	10	0	0	19	36	21	1068	0	0	0	0
Future Vol, veh/h	28	10	0	0	19	36	21	1068	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	70	-	70	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	1081	511	936	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	30	11	0	0	21	39	23	1161	0	0	0	0

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	637	1207	-	-	1207	581	0	0	0
Stage 1	0	0	-	-	1207	-	-	-	-
Stage 2	637	1207	-	-	0	-	-	-	-
Critical Hdwy	7.54	6.54	-	-	6.54	6.94	4.14	-	-
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	-	-	4.02	3.32	2.22	-	-
Pot Cap-1 Maneuver	362	182	0	0	182	457	-	-	-
Stage 1	-	-	0	0	254	-	-	-	-
Stage 2	432	254	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	302	182	-	-	182	457	-	-	-
Mov Cap-2 Maneuver	302	182	-	-	182	-	-	-	-
Stage 1	-	-	-	-	254	-	-	-	-
Stage 2	363	254	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	21.7	20	
HCM LOS	C	C	

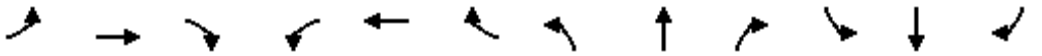
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	-	-	-	257	300
HCM Lane V/C Ratio	-	-	-	0.161	0.199
HCM Control Delay (s)	-	-	-	21.7	20
HCM Lane LOS	-	-	-	C	C
HCM 95th %tile Q(veh)	-	-	-	0.6	0.7



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	27	10	32	74	0	0	0	0	33	812	76
Future Volume (veh/h)	0	27	10	32	74	0	0	0	0	33	812	76
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
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1403	1347	1526	1465	0				1538	1538	1600
Adj Flow Rate, veh/h	0	31	7	36	84	0				38	923	86
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88				0.88	0.88	0.88
Percent Heavy Veh, %	0	14	14	4	4	0				3	3	3
Cap, veh/h	0	601	489	607	628	0				628	1158	108
Arrive On Green	0.00	0.43	0.43	0.43	0.43	0.00				0.43	0.43	0.43
Sat Flow, veh/h	0	1403	1141	1213	1465	0				1465	2702	252
Grp Volume(v), veh/h	0	31	7	36	84	0				38	499	510
Grp Sat Flow(s),veh/h/ln	0	1403	1141	1213	1465	0				1465	1461	1493
Q Serve(g_s), s	0.0	0.9	0.2	1.3	2.4	0.0				1.1	20.7	20.8
Cycle Q Clear(g_c), s	0.0	0.9	0.2	2.2	2.4	0.0				1.1	20.7	20.8
Prop In Lane	0.00		1.00	1.00		0.00				1.00		0.17
Lane Grp Cap(c), veh/h	0	601	489	607	628	0				628	626	640
V/C Ratio(X)	0.00	0.05	0.01	0.06	0.13	0.00				0.06	0.80	0.80
Avail Cap(c_a), veh/h	0	601	489	607	628	0				628	626	640
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	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	11.7	11.5	12.3	12.1	0.0				11.7	17.4	17.4
Incr Delay (d2), s/veh	0.0	0.2	0.1	0.2	0.4	0.0				0.2	10.2	10.0
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 BackOfQ(90%),veh/ln	0.0	0.5	0.1	0.6	1.5	0.0				0.7	11.8	12.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	11.8	11.6	12.5	12.6	0.0				11.9	27.5	27.3
LnGrp LOS	A	B	B	B	B	A				B	C	C
Approach Vol, veh/h		38			120						1047	
Approach Delay, s/veh		11.8			12.5						26.9	
Approach LOS		B			B						C	

Timer - Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				35.0		35.0		35.0				
Change Period (Y+Rc), s				5.0		5.0		5.0				
Max Green Setting (Gmax), s				30.0		30.0		30.0				
Max Q Clear Time (g_c+I1), s				2.9		22.8		4.4				
Green Ext Time (p_c), s				0.1		5.3		0.4				

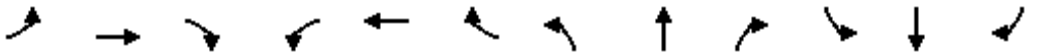
Intersection Summary												
HCM 6th Ctrl Delay			25.0									
HCM 6th LOS			C									



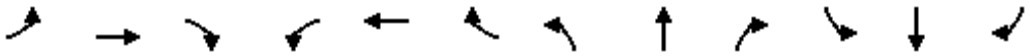
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	274	63	80	67	0	0	0	0	76	893	42
Future Volume (veh/h)	0	274	63	80	67	0	0	0	0	76	893	42
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1575	1512	1563	1500	0				1550	1550	1612
Adj Flow Rate, veh/h	0	304	70	89	74	0				84	992	47
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90				0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	1	1	0				2	2	2
Cap, veh/h	0	630	513	338	600	0				675	1309	62
Arrive On Green	0.00	0.40	0.40	0.40	0.40	0.00				0.46	0.46	0.46
Sat Flow, veh/h	0	1575	1281	915	1500	0				1477	2863	136
Grp Volume(v), veh/h	0	304	70	89	74	0				84	510	529
Grp Sat Flow(s),veh/h/ln	0	1575	1281	915	1500	0				1477	1473	1526
Q Serve(g_s), s	0.0	10.0	2.4	5.6	2.2	0.0				2.3	20.1	20.1
Cycle Q Clear(g_c), s	0.0	10.0	2.4	15.7	2.2	0.0				2.3	20.1	20.1
Prop In Lane	0.00		1.00	1.00		0.00				1.00		0.09
Lane Grp Cap(c), veh/h	0	630	513	338	600	0				675	673	698
V/C Ratio(X)	0.00	0.48	0.14	0.26	0.12	0.00				0.12	0.76	0.76
Avail Cap(c_a), veh/h	0	630	513	338	600	0				675	673	698
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	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	15.6	13.3	21.4	13.3	0.0				10.9	15.8	15.8
Incr Delay (d2), s/veh	0.0	2.6	0.6	1.9	0.4	0.0				0.4	7.8	7.6
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 BackOfQ(90%),veh/ln	0.0	6.4	1.3	2.4	1.4	0.0				1.4	11.1	11.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	18.2	13.9	23.3	13.7	0.0				11.3	23.6	23.3
LnGrp LOS	A	B	B	C	B	A				B	C	C
Approach Vol, veh/h		374			163						1123	
Approach Delay, s/veh		17.4			18.9						22.6	
Approach LOS		B			B						C	

Timer - Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				33.0		37.0		33.0				
Change Period (Y+Rc), s				5.0		5.0		5.0				
Max Green Setting (Gmax), s				28.0		32.0		28.0				
Max Q Clear Time (g_c+I1), s				12.0		22.1		17.7				
Green Ext Time (p_c), s				1.1		7.1		0.4				

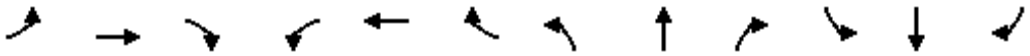
Intersection Summary												
HCM 6th Ctrl Delay			21.0									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	43	0	0	54	51	62	618	21	0	0	0
Future Volume (veh/h)	40	43	0	0	54	51	62	618	21	0	0	0
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			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1501	1501	0	0	1514	1514	1465	1526	1465			
Adj Flow Rate, veh/h	44	47	0	0	59	35	68	679	14			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91			
Percent Heavy Veh, %	6	6	0	0	5	5	4	4	4			
Cap, veh/h	478	536	0	0	541	458	698	1450	621			
Arrive On Green	0.36	0.36	0.00	0.00	0.36	0.36	0.17	0.17	0.17			
Sat Flow, veh/h	1135	1501	0	0	1514	1283	1395	2899	1241			
Grp Volume(v), veh/h	44	47	0	0	59	35	68	679	14			
Grp Sat Flow(s),veh/h/ln	1135	1501	0	0	1514	1283	1395	1450	1241			
Q Serve(g_s), s	1.9	1.5	0.0	0.0	1.8	1.3	2.9	14.8	0.7			
Cycle Q Clear(g_c), s	3.7	1.5	0.0	0.0	1.8	1.3	2.9	14.8	0.7			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	478	536	0	0	541	458	698	1450	621			
V/C Ratio(X)	0.09	0.09	0.00	0.00	0.11	0.08	0.10	0.47	0.02			
Avail Cap(c_a), veh/h	478	536	0	0	541	458	698	1450	621			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	16.3	14.9	0.0	0.0	15.1	14.9	15.8	20.8	14.9			
Incr Delay (d2), s/veh	0.4	0.3	0.0	0.0	0.4	0.3	0.3	1.1	0.1			
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 BackOfQ(90%),veh/ln	0.9	0.9	0.0	0.0	1.2	0.7	1.7	9.0	0.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.7	15.3	0.0	0.0	15.5	15.2	16.1	21.9	15.0			
LnGrp LOS	B	B	A	A	B	B	B	C	B			
Approach Vol, veh/h		91			94			761				
Approach Delay, s/veh		15.9			15.4			21.3				
Approach LOS		B			B			C				
Timer - Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		40.0		30.0				30.0				
Change Period (Y+Rc), s		5.0		5.0				5.0				
Max Green Setting (Gmax), s		35.0		25.0				25.0				
Max Q Clear Time (g_c+I1), s		16.8		5.7				3.8				
Green Ext Time (p_c), s		8.2		0.2				0.2				
Intersection Summary												
HCM 6th Ctrl Delay			20.2									
HCM 6th LOS			C									



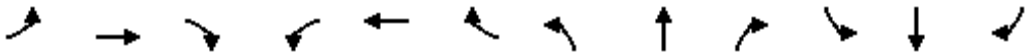
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	198	169	0	0	78	104	57	754	66	0	0	0
Future Volume (veh/h)	198	169	0	0	78	104	57	754	66	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1575	1575	0	0	1563	1563	1488	1550	1488			
Adj Flow Rate, veh/h	208	178	0	0	82	68	60	794	43			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	0	0	0	1	1	2	2	2			
Cap, veh/h	467	562	0	0	558	473	709	1473	631			
Arrive On Green	0.12	0.12	0.00	0.00	0.36	0.36	0.17	0.17	0.17			
Sat Flow, veh/h	1131	1575	0	0	1563	1324	1418	2946	1261			
Grp Volume(v), veh/h	208	178	0	0	82	68	60	794	43			
Grp Sat Flow(s),veh/h/ln	1131	1575	0	0	1563	1324	1418	1473	1261			
Q Serve(g_s), s	12.2	7.2	0.0	0.0	2.5	2.4	2.5	17.3	2.0			
Cycle Q Clear(g_c), s	14.7	7.2	0.0	0.0	2.5	2.4	2.5	17.3	2.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	467	563	0	0	558	473	709	1473	631			
V/C Ratio(X)	0.45	0.32	0.00	0.00	0.15	0.14	0.08	0.54	0.07			
Avail Cap(c_a), veh/h	467	563	0	0	558	473	709	1473	631			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	0.33	0.33	0.33			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	27.5	23.0	0.0	0.0	15.3	15.2	15.7	21.8	15.5			
Incr Delay (d2), s/veh	3.1	1.5	0.0	0.0	0.6	0.6	0.2	1.4	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 BackOfQ(90%),veh/ln	6.6	5.3	0.0	0.0	1.7	1.4	1.5	10.4	1.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.6	24.5	0.0	0.0	15.8	15.9	15.9	23.3	15.7			
LnGrp LOS	C	C	A	A	B	B	B	C	B			
Approach Vol, veh/h		386			150			897				
Approach Delay, s/veh		27.8			15.8			22.4				
Approach LOS		C			B			C				
Timer - Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		40.0		30.0				30.0				
Change Period (Y+Rc), s		5.0		5.0				5.0				
Max Green Setting (Gmax), s		35.0		25.0				25.0				
Max Q Clear Time (g_c+I1), s		19.3		16.7				4.5				
Green Ext Time (p_c), s		8.7		1.0				0.4				
Intersection Summary												
HCM 6th Ctrl Delay			23.2									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	14	4	18	114	0	0	0	0	38	761	16
Future Volume (veh/h)	0	14	4	18	114	0	0	0	0	38	761	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
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1440	1440	1538	1538	0				1538	1538	1538
Adj Flow Rate, veh/h	0	15	4	20	125	0				42	836	18
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91				0.91	0.91	0.91
Percent Heavy Veh, %	0	11	11	3	3	0				3	3	3
Cap, veh/h	0	485	129	116	610	0				57	1183	27
Arrive On Green	0.00	0.44	0.44	0.89	0.89	0.00				0.14	0.14	0.14
Sat Flow, veh/h	0	1095	292	131	1376	0				137	2856	64
Grp Volume(v), veh/h	0	0	19	145	0	0				470	0	426
Grp Sat Flow(s),veh/h/ln	0	0	1387	1507	0	0				1531	0	1527
Q Serve(g_s), s	0.0	0.0	0.5	0.0	0.0	0.0				20.6	0.0	18.6
Cycle Q Clear(g_c), s	0.0	0.0	0.5	0.9	0.0	0.0				20.6	0.0	18.6
Prop In Lane	0.00		0.21	0.14		0.00				0.09		0.04
Lane Grp Cap(c), veh/h	0	0	614	726	0	0				634	0	632
V/C Ratio(X)	0.00	0.00	0.03	0.20	0.00	0.00				0.74	0.00	0.67
Avail Cap(c_a), veh/h	0	0	614	726	0	0				634	0	632
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				0.33	0.33	0.33
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	11.0	2.3	0.0	0.0				26.6	0.0	25.7
Incr Delay (d2), s/veh	0.0	0.0	0.1	0.6	0.0	0.0				7.6	0.0	5.7
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 BackOfQ(90%),veh/ln	0.0	0.0	0.3	0.7	0.0	0.0				13.6	0.0	12.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	11.1	2.9	0.0	0.0				34.2	0.0	31.4
LnGrp LOS	A	A	B	A	A	A				C	A	C
Approach Vol, veh/h		19			145						896	
Approach Delay, s/veh		11.1			2.9						32.9	
Approach LOS		B			A						C	

Timer - Assigned Phs		4		6		8						
Phs Duration (G+Y+Rc), s		36.0		34.0		36.0						
Change Period (Y+Rc), s		5.0		5.0		5.0						
Max Green Setting (Gmax), s		31.0		29.0		31.0						
Max Q Clear Time (g_c+I1), s		2.5		22.6		2.9						
Green Ext Time (p_c), s		0.0		4.2		0.4						

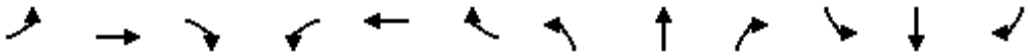
Intersection Summary												
HCM 6th Ctrl Delay		28.4										
HCM 6th LOS		C										



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	106	34	83	58	0	0	0	0	99	921	27
Future Volume (veh/h)	0	106	34	83	58	0	0	0	0	99	921	27
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
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1563	1563	1575	1575	0				1563	1563	1563
Adj Flow Rate, veh/h	0	113	36	88	62	0				105	980	29
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	1	1	0	0	0				1	1	1
Cap, veh/h	0	503	160	368	234	0				115	1132	35
Arrive On Green	0.00	0.44	0.44	0.44	0.44	0.00				0.14	0.14	0.14
Sat Flow, veh/h	0	1136	362	647	528	0				279	2733	85
Grp Volume(v), veh/h	0	0	149	150	0	0				583	0	531
Grp Sat Flow(s),veh/h/ln	0	0	1498	1175	0	0				1549	0	1547
Q Serve(g_s), s	0.0	0.0	4.3	3.8	0.0	0.0				26.0	0.0	23.4
Cycle Q Clear(g_c), s	0.0	0.0	4.3	8.1	0.0	0.0				26.0	0.0	23.4
Prop In Lane	0.00		0.24	0.59		0.00				0.18		0.05
Lane Grp Cap(c), veh/h	0	0	663	602	0	0				642	0	641
V/C Ratio(X)	0.00	0.00	0.22	0.25	0.00	0.00				0.91	0.00	0.83
Avail Cap(c_a), veh/h	0	0	663	602	0	0				642	0	641
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				0.33	0.33	0.33
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	12.1	13.4	0.0	0.0				28.9	0.0	27.8
Incr Delay (d2), s/veh	0.0	0.0	0.8	1.0	0.0	0.0				19.2	0.0	11.7
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 BackOfQ(90%),veh/ln	0.0	0.0	2.7	3.0	0.0	0.0				18.8	0.0	16.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	12.8	14.4	0.0	0.0				48.1	0.0	39.5
LnGrp LOS	A	A	B	B	A	A				D	A	D
Approach Vol, veh/h		149			150						1114	
Approach Delay, s/veh		12.8			14.4						44.0	
Approach LOS		B			B						D	

Timer - Assigned Phs		4		6		8			
Phs Duration (G+Y+Rc), s		36.0		34.0		36.0			
Change Period (Y+Rc), s		5.0		5.0		5.0			
Max Green Setting (Gmax), s		31.0		29.0		31.0			
Max Q Clear Time (g_c+I1), s		6.3		28.0		10.1			
Green Ext Time (p_c), s		0.4		0.8		0.5			

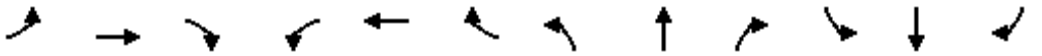
Intersection Summary									
HCM 6th Ctrl Delay		37.6							
HCM 6th LOS		D							



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	36	22	55	56	39	76	820	17	34	889	57
Future Volume (veh/h)	55	36	22	55	56	39	76	820	17	34	889	57
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1682	1614	1682	1736	1667	1736	1695	1695	1695	1695	1695	1695
Adj Flow Rate, veh/h	61	40	24	61	62	43	84	911	19	38	988	63
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	5	5	5	1	1	1	4	4	4	4	4	4
Cap, veh/h	474	324	194	526	314	218	253	1659	35	407	1581	101
Arrive On Green	0.34	0.34	0.34	0.34	0.34	0.34	1.00	1.00	1.00	0.51	0.51	0.51
Sat Flow, veh/h	1258	945	567	1348	917	636	528	3227	67	592	3075	196
Grp Volume(v), veh/h	61	0	64	61	0	105	84	455	475	38	518	533
Grp Sat Flow(s),veh/h/ln	1258	0	1512	1348	0	1552	528	1611	1683	592	1611	1660
Q Serve(g_s), s	2.5	0.0	2.0	2.3	0.0	3.3	7.2	0.0	0.0	2.3	16.1	16.1
Cycle Q Clear(g_c), s	5.9	0.0	2.0	4.3	0.0	3.3	23.3	0.0	0.0	2.3	16.1	16.1
Prop In Lane	1.00		0.38	1.00		0.41	1.00		0.04	1.00		0.12
Lane Grp Cap(c), veh/h	474	0	519	526	0	532	253	828	866	407	828	854
V/C Ratio(X)	0.13	0.00	0.12	0.12	0.00	0.20	0.33	0.55	0.55	0.09	0.62	0.62
Avail Cap(c_a), veh/h	474	0	519	526	0	532	253	828	866	407	828	854
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.82	0.82	0.82	0.64	0.64	0.64
Uniform Delay (d), s/veh	18.3	0.0	15.8	17.3	0.0	16.2	5.2	0.0	0.0	8.8	12.2	12.2
Incr Delay (d2), s/veh	0.6	0.0	0.5	0.4	0.0	0.8	2.9	2.1	2.1	0.3	2.3	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	1.4	0.0	1.3	1.3	0.0	2.3	1.1	0.9	0.9	0.6	8.1	8.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.8	0.0	16.3	17.7	0.0	17.0	8.1	2.1	2.1	9.1	14.5	14.4
LnGrp LOS	B	A	B	B	A	B	A	A	A	A	B	B
Approach Vol, veh/h		125			166			1014			1089	
Approach Delay, s/veh		17.5			17.3			2.6			14.2	
Approach LOS		B			B			A			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		41.0		29.0		41.0		29.0				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		36.0		24.0		36.0		24.0				
Max Q Clear Time (g_c+I1), s		4.3		7.9		25.3		6.3				
Green Ext Time (p_c), s		0.2		0.9		0.2		1.3				

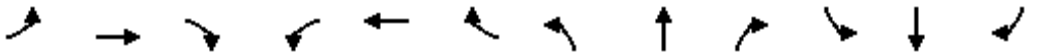
Intersection Summary												
HCM 6th Ctrl Delay			9.7									
HCM 6th LOS			A									



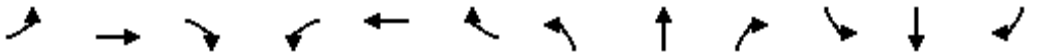
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	102	91	68	81	90	68	54	1077	28	74	889	40
Future Volume (veh/h)	102	91	68	81	90	68	54	1077	28	74	889	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1667	1736	1709	1641	1709	1723	1723	1723	1736	1736	1736
Adj Flow Rate, veh/h	105	94	70	84	93	70	56	1110	29	76	916	41
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	3	3	3	2	2	2	1	1	1
Cap, veh/h	391	288	215	387	282	213	308	1792	47	364	1769	79
Arrive On Green	0.32	0.32	0.32	0.32	0.32	0.32	1.00	1.00	1.00	0.55	0.55	0.55
Sat Flow, veh/h	1233	887	661	1212	869	654	587	3259	85	498	3216	144
Grp Volume(v), veh/h	105	0	164	84	0	163	56	557	582	76	470	487
Grp Sat Flow(s),veh/h/ln	1233	0	1548	1212	0	1523	587	1637	1707	498	1650	1710
Q Serve(g_s), s	5.6	0.0	6.4	4.5	0.0	6.5	3.0	0.0	0.0	6.5	14.3	14.3
Cycle Q Clear(g_c), s	12.1	0.0	6.4	10.9	0.0	6.5	17.3	0.0	0.0	6.5	14.3	14.3
Prop In Lane	1.00		0.43	1.00		0.43	1.00		0.05	1.00		0.08
Lane Grp Cap(c), veh/h	391	0	503	387	0	495	308	900	939	364	907	941
V/C Ratio(X)	0.27	0.00	0.33	0.22	0.00	0.33	0.18	0.62	0.62	0.21	0.52	0.52
Avail Cap(c_a), veh/h	391	0	503	387	0	495	308	900	939	364	907	941
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.67	0.67	0.67	0.76	0.76	0.76
Uniform Delay (d), s/veh	25.0	0.0	20.4	24.5	0.0	20.4	2.8	0.0	0.0	9.6	11.3	11.3
Incr Delay (d2), s/veh	1.7	0.0	1.7	1.3	0.0	1.8	0.9	2.2	2.1	1.0	1.6	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	3.2	0.0	4.5	2.5	0.0	4.5	0.4	1.0	1.0	1.4	7.8	8.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.7	0.0	22.1	25.8	0.0	22.2	3.7	2.2	2.1	10.5	12.9	12.9
LnGrp LOS	C	A	C	C	A	C	A	A	A	B	B	B
Approach Vol, veh/h		269			247			1195			1033	
Approach Delay, s/veh		23.9			23.4			2.2			12.7	
Approach LOS		C			C			A			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		49.0		31.0		49.0		31.0				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		44.0		26.0		44.0		26.0				
Max Q Clear Time (g_c+I1), s		8.5		14.1		19.3		12.9				
Green Ext Time (p_c), s		0.2		1.9		0.3		1.9				

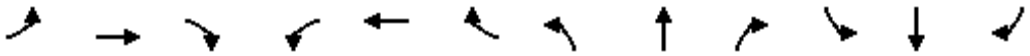
Intersection Summary												
HCM 6th Ctrl Delay			10.2									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	35	0	0	81	20	66	679	22	0	0	0
Future Volume (veh/h)	14	35	0	0	81	20	66	679	22	0	0	0
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			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1501	1441	0	0	1477	1538	1465	1526	1465			
Adj Flow Rate, veh/h	18	45	0	0	105	16	86	882	18			
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77			
Percent Heavy Veh, %	6	6	0	0	3	3	4	4	4			
Cap, veh/h	444	515	0	0	527	466	698	1450	621			
Arrive On Green	0.36	0.36	0.00	0.00	0.36	0.36	0.50	0.50	0.50			
Sat Flow, veh/h	1107	1441	0	0	1477	1304	1395	2899	1241			
Grp Volume(v), veh/h	18	45	0	0	105	16	86	882	18			
Grp Sat Flow(s),veh/h/ln	1107	1441	0	0	1477	1304	1395	1450	1241			
Q Serve(g_s), s	0.8	1.5	0.0	0.0	3.4	0.6	2.3	15.3	0.5			
Cycle Q Clear(g_c), s	4.2	1.5	0.0	0.0	3.4	0.6	2.3	15.3	0.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	444	515	0	0	527	466	698	1450	621			
V/C Ratio(X)	0.04	0.09	0.00	0.00	0.20	0.03	0.12	0.61	0.03			
Avail Cap(c_a), veh/h	444	515	0	0	527	466	698	1450	621			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	17.0	14.9	0.0	0.0	15.6	14.6	9.3	12.6	8.9			
Incr Delay (d2), s/veh	0.2	0.3	0.0	0.0	0.8	0.1	0.4	1.9	0.1			
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 BackOfQ(90%),veh/ln	0.4	0.9	0.0	0.0	2.2	0.3	1.3	7.7	0.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.2	15.3	0.0	0.0	16.4	14.8	9.7	14.5	9.0			
LnGrp LOS	B	B	A	A	B	B	A	B	A			
Approach Vol, veh/h		63			121			986				
Approach Delay, s/veh		15.8			16.2			14.0				
Approach LOS		B			B			B				
Timer - Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		40.0		30.0				30.0				
Change Period (Y+Rc), s		5.0		5.0				5.0				
Max Green Setting (Gmax), s		35.0		25.0				25.0				
Max Q Clear Time (g_c+I1), s		17.3		6.2				5.4				
Green Ext Time (p_c), s		10.4		0.1				0.3				
Intersection Summary												
HCM 6th Ctrl Delay			14.3									
HCM 6th LOS			B									



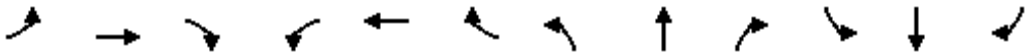
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	74	135	0	0	79	55	68	759	64	0	0	0
Future Volume (veh/h)	74	135	0	0	79	55	68	759	64	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1563	1500	0	0	1512	1575	1488	1550	1488			
Adj Flow Rate, veh/h	76	139	0	0	81	35	70	782	41			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	1	1	0	0	0	0	2	2	2			
Cap, veh/h	474	536	0	0	540	477	709	1473	631			
Arrive On Green	0.71	0.71	0.00	0.00	0.36	0.36	0.50	0.50	0.50			
Sat Flow, veh/h	1158	1500	0	0	1512	1335	1418	2946	1261			
Grp Volume(v), veh/h	76	139	0	0	81	35	70	782	41			
Grp Sat Flow(s),veh/h/ln	1158	1500	0	0	1512	1335	1418	1473	1261			
Q Serve(g_s), s	1.9	2.3	0.0	0.0	2.5	1.2	1.8	12.6	1.2			
Cycle Q Clear(g_c), s	4.4	2.3	0.0	0.0	2.5	1.2	1.8	12.6	1.2			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	474	536	0	0	540	477	709	1473	631			
V/C Ratio(X)	0.16	0.26	0.00	0.00	0.15	0.07	0.10	0.53	0.07			
Avail Cap(c_a), veh/h	474	536	0	0	540	477	709	1473	631			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	7.6	6.8	0.0	0.0	15.3	14.9	9.2	11.9	9.0			
Incr Delay (d2), s/veh	0.7	1.2	0.0	0.0	0.6	0.3	0.3	1.4	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 BackOfQ(90%),veh/ln	0.8	1.5	0.0	0.0	1.7	0.7	1.0	6.6	0.6			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.3	7.9	0.0	0.0	15.9	15.2	9.5	13.3	9.2			
LnGrp LOS	A	A	A	A	B	B	A	B	A			
Approach Vol, veh/h		215			116			893				
Approach Delay, s/veh		8.1			15.7			12.8				
Approach LOS		A			B			B				
Timer - Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		40.0		30.0				30.0				
Change Period (Y+Rc), s		5.0		5.0				5.0				
Max Green Setting (Gmax), s		35.0		25.0				25.0				
Max Q Clear Time (g_c+I1), s		14.6		6.4				4.5				
Green Ext Time (p_c), s		10.3		0.7				0.3				
Intersection Summary												
HCM 6th Ctrl Delay			12.2									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	103	13	29	37	59	48	105	1171	9	12	1139	102
Future Volume (veh/h)	103	13	29	37	59	48	105	1171	9	12	1139	102
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1667	1736	1709	1709	1709	1723	1723	1723	1695	1695	1695
Adj Flow Rate, veh/h	117	15	33	42	67	55	119	1331	10	14	1294	116
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	1	1	1	3	3	3	2	2	2	4	4	4
Cap, veh/h	220	85	186	283	159	130	279	2175	16	269	1855	166
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.05	0.65	0.65	0.02	0.62	0.62
Sat Flow, veh/h	1279	464	1020	1347	868	713	1641	3330	25	1615	2991	267
Grp Volume(v), veh/h	117	0	48	42	0	122	119	654	687	14	695	715
Grp Sat Flow(s),veh/h/ln	1279	0	1483	1347	0	1581	1641	1637	1718	1615	1611	1647
Q Serve(g_s), s	8.7	0.0	2.7	2.7	0.0	6.7	2.4	22.6	22.7	0.3	28.3	28.6
Cycle Q Clear(g_c), s	15.5	0.0	2.7	5.3	0.0	6.7	2.4	22.6	22.7	0.3	28.3	28.6
Prop In Lane	1.00		0.69	1.00		0.45	1.00		0.01	1.00		0.16
Lane Grp Cap(c), veh/h	220	0	271	283	0	289	279	1069	1122	269	999	1022
V/C Ratio(X)	0.53	0.00	0.18	0.15	0.00	0.42	0.43	0.61	0.61	0.05	0.70	0.70
Avail Cap(c_a), veh/h	508	0	605	586	0	644	533	1168	1226	572	1149	1175
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.3	0.0	33.9	36.1	0.0	35.5	12.0	9.8	9.8	8.5	12.4	12.5
Incr Delay (d2), s/veh	1.8	0.0	0.3	0.2	0.0	0.9	0.4	1.4	1.3	0.0	2.3	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	5.0	0.0	1.8	1.6	0.0	4.8	1.9	11.4	11.9	0.2	14.1	14.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.1	0.0	34.1	36.3	0.0	36.4	12.4	11.2	11.2	8.6	14.8	14.8
LnGrp LOS	D	A	C	D	A	D	B	B	B	A	B	B
Approach Vol, veh/h		165			164			1460			1424	
Approach Delay, s/veh		41.2			36.4			11.3			14.7	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.6	69.6		23.9	7.8	66.4		23.9				
Change Period (Y+Rc), s	3.0	5.5		6.0	3.0	5.5		6.0				
Max Green Setting (Gmax), s	20.0	70.0		40.0	20.0	70.0		40.0				
Max Q Clear Time (g_c+I1), s	2.3	24.7		17.5	4.4	30.6		8.7				
Green Ext Time (p_c), s	0.0	31.9		0.7	0.1	30.3		0.7				

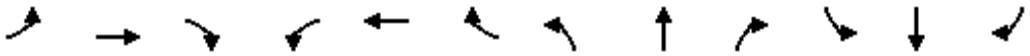
Intersection Summary			
HCM 6th Ctrl Delay		15.6	
HCM 6th LOS		B	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	51	94	14	18	33	66	1321	25	54	1190	75
Future Volume (veh/h)	135	51	94	14	18	33	66	1321	25	54	1190	75
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1680	1750	1723	1723	1723	1709	1709	1709	1723	1723	1723
Adj Flow Rate, veh/h	139	53	97	14	19	34	68	1362	26	56	1227	77
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	2	2	2	3	3	3	2	2	2
Cap, veh/h	262	87	159	166	90	162	318	2076	40	293	1981	124
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.04	0.64	0.64	0.04	0.63	0.63
Sat Flow, veh/h	1373	532	973	1237	554	991	1628	3259	62	1641	3128	196
Grp Volume(v), veh/h	139	0	150	14	0	53	68	678	710	56	641	663
Grp Sat Flow(s),veh/h/ln	1373	0	1505	1237	0	1544	1628	1624	1698	1641	1637	1687
Q Serve(g_s), s	8.9	0.0	8.5	1.0	0.0	2.7	1.3	23.8	23.9	1.1	21.6	21.7
Cycle Q Clear(g_c), s	11.7	0.0	8.5	9.5	0.0	2.7	1.3	23.8	23.9	1.1	21.6	21.7
Prop In Lane	1.00		0.65	1.00		0.64	1.00		0.04	1.00		0.12
Lane Grp Cap(c), veh/h	262	0	246	166	0	252	318	1034	1081	293	1037	1069
V/C Ratio(X)	0.53	0.00	0.61	0.08	0.00	0.21	0.21	0.66	0.66	0.19	0.62	0.62
Avail Cap(c_a), veh/h	637	0	657	504	0	675	600	1241	1298	583	1251	1290
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.3	0.0	35.6	40.0	0.0	33.2	8.0	10.4	10.4	8.6	10.1	10.1
Incr Delay (d2), s/veh	1.5	0.0	2.2	0.2	0.0	0.4	0.1	1.7	1.6	0.1	1.3	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	5.4	0.0	5.6	0.6	0.0	1.9	0.7	11.8	12.2	0.6	10.9	11.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.8	0.0	37.8	40.2	0.0	33.6	8.1	12.0	12.0	8.7	11.4	11.4
LnGrp LOS	D	A	D	D	A	C	A	B	B	A	B	B
Approach Vol, veh/h		289			67			1456			1360	
Approach Delay, s/veh		38.8			35.0			11.8			11.3	
Approach LOS		D			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.8	63.8		21.0	7.1	63.5		21.0				
Change Period (Y+Rc), s	3.0	5.5		6.0	3.0	5.5		6.0				
Max Green Setting (Gmax), s	20.0	70.0		40.0	20.0	70.0		40.0				
Max Q Clear Time (g_c+I1), s	3.1	25.9		13.7	3.3	23.7		11.5				
Green Ext Time (p_c), s	0.0	32.4		1.3	0.1	31.5		0.2				

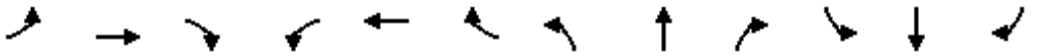
Intersection Summary			
HCM 6th Ctrl Delay		14.6	
HCM 6th LOS		B	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	63	31	87	175	94	60	776	18	44	905	41
Future Volume (veh/h)	56	63	31	87	175	94	60	776	18	44	905	41
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1709	1709	1709	1736	1736	1806	1695	1695	1695	1709	1709	1777
Adj Flow Rate, veh/h	62	70	34	97	194	104	67	862	20	49	1006	46
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	1	1	1	4	4	4	3	3	3
Cap, veh/h	277	526	240	384	512	263	461	1698	39	499	1642	75
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.10	1.00	1.00	0.09	1.00	1.00
Sat Flow, veh/h	1073	2168	987	1300	2108	1083	1615	3218	75	1628	3162	145
Grp Volume(v), veh/h	62	51	53	97	150	148	67	431	451	49	517	535
Grp Sat Flow(s),veh/h/ln	1073	1624	1531	1300	1650	1541	1615	1611	1682	1628	1624	1683
Q Serve(g_s), s	3.6	1.7	1.9	4.4	5.3	5.6	1.3	0.0	0.0	0.9	0.0	0.0
Cycle Q Clear(g_c), s	9.2	1.7	1.9	6.3	5.3	5.6	1.3	0.0	0.0	0.9	0.0	0.0
Prop In Lane	1.00		0.64	1.00		0.70	1.00		0.04	1.00		0.09
Lane Grp Cap(c), veh/h	277	394	372	384	401	374	461	850	887	499	843	874
V/C Ratio(X)	0.22	0.13	0.14	0.25	0.37	0.40	0.15	0.51	0.51	0.10	0.61	0.61
Avail Cap(c_a), veh/h	384	557	525	514	566	529	562	850	887	613	843	874
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.79	0.79	0.79	0.75	0.75	0.75
Uniform Delay (d), s/veh	26.1	20.7	20.8	23.3	22.1	22.2	6.3	0.0	0.0	6.6	0.0	0.0
Incr Delay (d2), s/veh	0.9	0.3	0.4	0.7	1.2	1.4	0.2	1.7	1.6	0.1	2.5	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	1.7	1.2	1.3	2.5	3.8	3.8	0.7	0.7	0.7	0.5	1.1	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.9	21.0	21.1	24.0	23.3	23.6	6.5	1.7	1.6	6.7	2.5	2.4
LnGrp LOS	C	C	C	C	C	C	A	A	A	A	A	A
Approach Vol, veh/h		166			395			949			1101	
Approach Delay, s/veh		23.3			23.6			2.0			2.6	
Approach LOS		C			C			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	41.4		22.0	6.1	41.9		22.0				
Change Period (Y+Rc), s	3.0	5.0		5.0	3.0	5.0		5.0				
Max Green Setting (Gmax), s	8.0	25.0		24.0	8.0	25.0		24.0				
Max Q Clear Time (g_c+I1), s	3.3	0.0		11.2	2.9	0.0		8.3				
Green Ext Time (p_c), s	0.1	0.0		1.2	0.0	0.0		3.6				

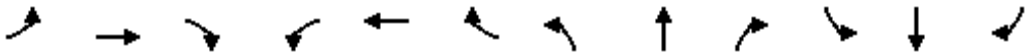
Intersection Summary												
HCM 6th Ctrl Delay			6.9									
HCM 6th LOS			A									



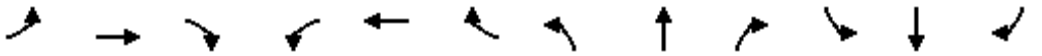
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	189	106	38	138	64	55	1033	67	73	914	71
Future Volume (veh/h)	106	189	106	38	138	64	55	1033	67	73	914	71
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1736	1736	1723	1723	1792	1723	1723	1723	1736	1736	1806
Adj Flow Rate, veh/h	110	197	110	40	144	67	57	1076	70	76	952	74
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	2	2	2	2	2	2	1	1	1
Cap, veh/h	272	441	236	225	469	208	479	1791	116	347	1799	140
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.04	0.57	0.57	0.10	1.00	1.00
Sat Flow, veh/h	1180	2076	1110	1072	2205	978	1641	3120	203	1654	3101	241
Grp Volume(v), veh/h	110	155	152	40	105	106	57	564	582	76	506	520
Grp Sat Flow(s),veh/h/ln	1180	1650	1537	1072	1637	1547	1641	1637	1686	1654	1650	1693
Q Serve(g_s), s	7.0	6.5	6.9	2.7	4.3	4.6	1.1	17.9	17.9	1.4	0.0	0.0
Cycle Q Clear(g_c), s	11.6	6.5	6.9	9.6	4.3	4.6	1.1	17.9	17.9	1.4	0.0	0.0
Prop In Lane	1.00		0.72	1.00		0.63	1.00		0.12	1.00		0.14
Lane Grp Cap(c), veh/h	272	351	327	225	348	329	479	939	968	347	957	982
V/C Ratio(X)	0.40	0.44	0.47	0.18	0.30	0.32	0.12	0.60	0.60	0.22	0.53	0.53
Avail Cap(c_a), veh/h	405	536	499	346	532	503	611	939	968	470	957	982
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.62	0.62	0.62	0.85	0.85	0.85
Uniform Delay (d), s/veh	31.5	27.4	27.5	31.7	26.5	26.6	6.0	11.1	11.1	7.8	0.0	0.0
Incr Delay (d2), s/veh	2.1	1.9	2.2	0.8	1.0	1.2	0.1	1.8	1.7	0.4	1.8	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	3.8	4.8	4.8	1.3	3.2	3.2	0.6	8.8	9.1	0.8	0.9	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.6	29.2	29.7	32.5	27.5	27.8	6.1	12.8	12.8	8.2	1.8	1.7
LnGrp LOS	C	C	C	C	C	C	A	B	B	A	A	A
Approach Vol, veh/h		417			251			1203			1102	
Approach Delay, s/veh		30.6			28.5			12.5			2.2	
Approach LOS		C			C			B			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	51.4		22.0	7.1	50.9		22.0				
Change Period (Y+Rc), s	3.0	5.0		5.0	3.0	5.0		5.0				
Max Green Setting (Gmax), s	10.0	31.0		26.0	10.0	31.0		26.0				
Max Q Clear Time (g_c+I1), s	3.1	0.0		13.6	3.4	0.0		11.6				
Green Ext Time (p_c), s	0.1	0.0		3.3	0.1	0.0		2.1				

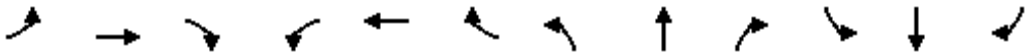
Intersection Summary			
HCM 6th Ctrl Delay		12.6	
HCM 6th LOS		B	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	31	0	0	25	26	51	729	19	0	0	0
Future Volume (veh/h)	39	31	0	0	25	26	51	729	19	0	0	0
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			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1317	1317	0	0	1501	1441	1465	1526	1526			
Adj Flow Rate, veh/h	50	40	0	0	32	21	65	935	15			
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78			
Percent Heavy Veh, %	21	21	0	0	6	6	4	4	4			
Cap, veh/h	457	470	0	0	536	436	698	1450	647			
Arrive On Green	0.36	0.36	0.00	0.00	0.36	0.36	0.17	0.17	0.17			
Sat Flow, veh/h	1033	1317	0	0	1501	1221	1395	2899	1293			
Grp Volume(v), veh/h	50	40	0	0	32	21	65	935	15			
Grp Sat Flow(s),veh/h/ln	1033	1317	0	0	1501	1221	1395	1450	1293			
Q Serve(g_s), s	2.3	1.4	0.0	0.0	1.0	0.8	2.8	21.1	0.7			
Cycle Q Clear(g_c), s	3.3	1.4	0.0	0.0	1.0	0.8	2.8	21.1	0.7			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	457	470	0	0	536	436	698	1450	647			
V/C Ratio(X)	0.11	0.09	0.00	0.00	0.06	0.05	0.09	0.65	0.02			
Avail Cap(c_a), veh/h	457	470	0	0	536	436	698	1450	647			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	15.9	14.9	0.0	0.0	14.8	14.7	15.8	23.4	14.9			
Incr Delay (d2), s/veh	0.5	0.4	0.0	0.0	0.2	0.2	0.3	2.2	0.1			
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 BackOfQ(90%),veh/ln	1.1	0.8	0.0	0.0	0.6	0.4	1.6	12.2	0.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.4	15.3	0.0	0.0	15.0	14.9	16.0	25.6	15.0			
LnGrp LOS	B	B	A	A	B	B	B	C	B			
Approach Vol, veh/h		90			53			1015				
Approach Delay, s/veh		15.9			15.0			24.9				
Approach LOS		B			B			C				
Timer - Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		40.0		30.0				30.0				
Change Period (Y+Rc), s		5.0		5.0				5.0				
Max Green Setting (Gmax), s		35.0		25.0				25.0				
Max Q Clear Time (g_c+I1), s		23.1		5.3				3.0				
Green Ext Time (p_c), s		7.9		0.3				0.1				
Intersection Summary												
HCM 6th Ctrl Delay			23.7									
HCM 6th LOS			C									



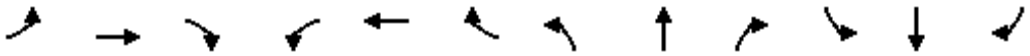
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	72	0	0	45	47	49	833	29	0	0	0
Future Volume (veh/h)	99	72	0	0	45	47	49	833	29	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1514	1514	0	0	1526	1465	1488	1550	1550			
Adj Flow Rate, veh/h	103	75	0	0	47	30	51	868	19			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	5	5	0	0	4	4	2	2	2			
Cap, veh/h	494	541	0	0	545	443	709	1473	657			
Arrive On Green	0.36	0.36	0.00	0.00	0.36	0.36	0.17	0.17	0.17			
Sat Flow, veh/h	1162	1514	0	0	1526	1241	1418	2946	1314			
Grp Volume(v), veh/h	103	75	0	0	47	30	51	868	19			
Grp Sat Flow(s),veh/h/ln	1162	1514	0	0	1526	1241	1418	1473	1314			
Q Serve(g_s), s	4.5	2.3	0.0	0.0	1.4	1.1	2.1	19.1	0.8			
Cycle Q Clear(g_c), s	5.9	2.3	0.0	0.0	1.4	1.1	2.1	19.1	0.8			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	494	541	0	0	545	443	709	1473	657			
V/C Ratio(X)	0.21	0.14	0.00	0.00	0.09	0.07	0.07	0.59	0.03			
Avail Cap(c_a), veh/h	494	541	0	0	545	443	709	1473	657			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	16.9	15.2	0.0	0.0	14.9	14.8	15.5	22.6	15.0			
Incr Delay (d2), s/veh	1.0	0.5	0.0	0.0	0.3	0.3	0.2	1.7	0.1			
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 BackOfQ(90%),veh/ln	2.3	1.5	0.0	0.0	0.9	0.6	1.2	11.3	0.4			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.9	15.8	0.0	0.0	15.2	15.1	15.7	24.3	15.0			
LnGrp LOS	B	B	A	A	B	B	B	C	B			
Approach Vol, veh/h		178			77			938				
Approach Delay, s/veh		17.0			15.2			23.7				
Approach LOS		B			B			C				
Timer - Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		40.0		30.0				30.0				
Change Period (Y+Rc), s		5.0		5.0				5.0				
Max Green Setting (Gmax), s		35.0		25.0				25.0				
Max Q Clear Time (g_c+I1), s		21.1		7.9				3.4				
Green Ext Time (p_c), s		8.4		0.5				0.2				
Intersection Summary												
HCM 6th Ctrl Delay			22.1									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	22	17	17	57	0	0	0	0	42	679	69
Future Volume (veh/h)	0	22	17	17	57	0	0	0	0	42	679	69
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
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1452	1394	1514	1514	1514				1538	1538	1538
Adj Flow Rate, veh/h	0	25	12	19	64	0				47	763	78
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	10	10	5	5	5				3	3	3
Cap, veh/h	0	581	473	163	479	0				70	1183	127
Arrive On Green	0.00	0.40	0.40	0.40	0.40	0.00				0.46	0.46	0.46
Sat Flow, veh/h	0	1452	1181	251	1199	0				153	2587	278
Grp Volume(v), veh/h	0	25	12	83	0	0				471	0	417
Grp Sat Flow(s),veh/h/ln	0	1452	1181	1449	0	0				1531	0	1488
Q Serve(g_s), s	0.0	0.7	0.4	0.0	0.0	0.0				16.9	0.0	14.8
Cycle Q Clear(g_c), s	0.0	0.7	0.4	2.4	0.0	0.0				16.9	0.0	14.8
Prop In Lane	0.00		1.00	0.23		0.00				0.10		0.19
Lane Grp Cap(c), veh/h	0	581	473	643	0	0				700	0	680
V/C Ratio(X)	0.00	0.04	0.03	0.13	0.00	0.00				0.67	0.00	0.61
Avail Cap(c_a), veh/h	0	581	473	643	0	0				700	0	680
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	1.00	1.00	1.00	0.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	12.8	12.7	13.3	0.0	0.0				14.9	0.0	14.3
Incr Delay (d2), s/veh	0.0	0.1	0.1	0.4	0.0	0.0				5.1	0.0	4.1
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 BackOfQ(90%),veh/ln	0.0	0.5	0.2	1.6	0.0	0.0				9.6	0.0	8.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	13.0	12.8	13.7	0.0	0.0				20.0	0.0	18.4
LnGrp LOS	A	B	B	B	A	A				C	A	B
Approach Vol, veh/h		37			83						888	
Approach Delay, s/veh		12.9			13.7						19.3	
Approach LOS		B			B						B	

Timer - Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				33.0		37.0		33.0				
Change Period (Y+Rc), s				5.0		5.0		5.0				
Max Green Setting (Gmax), s				28.0		32.0		28.0				
Max Q Clear Time (g_c+I1), s				2.7		0.0		4.4				
Green Ext Time (p_c), s				0.1		0.0		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			18.6									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	71	86	59	40	0	0	0	0	94	914	41
Future Volume (veh/h)	0	71	86	59	40	0	0	0	0	94	914	41
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
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1563	1500	1514	1514	1514				1550	1550	1550
Adj Flow Rate, veh/h	0	74	56	61	42	0				98	952	43
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %	0	1	1	5	5	5				2	2	2
Cap, veh/h	0	670	545	377	233	0				112	1147	54
Arrive On Green	0.00	0.43	0.43	0.43	0.43	0.00				0.43	0.43	0.43
Sat Flow, veh/h	0	1563	1271	688	543	0				262	2676	127
Grp Volume(v), veh/h	0	74	56	103	0	0				574	0	519
Grp Sat Flow(s),veh/h/ln	0	1563	1271	1230	0	0				1537	0	1528
Q Serve(g_s), s	0.0	2.0	1.8	2.0	0.0	0.0				23.8	0.0	20.6
Cycle Q Clear(g_c), s	0.0	2.0	1.8	4.0	0.0	0.0				23.8	0.0	20.6
Prop In Lane	0.00		1.00	0.59		0.00				0.17		0.08
Lane Grp Cap(c), veh/h	0	670	545	609	0	0				659	0	655
V/C Ratio(X)	0.00	0.11	0.10	0.17	0.00	0.00				0.87	0.00	0.79
Avail Cap(c_a), veh/h	0	670	545	609	0	0				659	0	655
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	1.00	1.00	1.00	0.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	12.0	12.0	12.5	0.0	0.0				18.2	0.0	17.3
Incr Delay (d2), s/veh	0.0	0.3	0.4	0.6	0.0	0.0				14.7	0.0	9.5
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 BackOfQ(90%),veh/ln	0.0	1.3	1.0	1.9	0.0	0.0				14.6	0.0	12.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	12.3	12.3	13.1	0.0	0.0				33.0	0.0	26.9
LnGrp LOS	A	B	B	B	A	A				C	A	C
Approach Vol, veh/h		130			103						1093	
Approach Delay, s/veh		12.3			13.1						30.1	
Approach LOS		B			B						C	

Timer - Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				35.0		35.0		35.0				
Change Period (Y+Rc), s				5.0		5.0		5.0				
Max Green Setting (Gmax), s				30.0		30.0		30.0				
Max Q Clear Time (g_c+I1), s				4.0		0.0		6.0				
Green Ext Time (p_c), s				0.4		0.0		0.3				

Intersection Summary												
HCM 6th Ctrl Delay			27.0									
HCM 6th LOS			C									

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	28	0	0	13	3	44	810	29	0	0	0
Future Vol, veh/h	11	28	0	0	13	3	44	810	29	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	75	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	1081	921	536	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	30	0	0	14	3	48	880	32	0	0	0

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	543	1008	-	-	976	440	0	0	0
Stage 1	0	0	-	-	976	-	-	-	-
Stage 2	543	1008	-	-	0	-	-	-	-
Critical Hdwy	7.54	6.54	-	-	6.54	6.94	4.14	-	-
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	-	-	4.02	3.32	2.22	-	-
Pot Cap-1 Maneuver	423	239	0	0	250	565	-	-	-
Stage 1	-	-	0	0	327	-	-	-	-
Stage 2	492	316	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	402	239	-	-	250	565	-	-	-
Mov Cap-2 Maneuver	402	239	-	-	250	-	-	-	-
Stage 1	-	-	-	-	327	-	-	-	-
Stage 2	468	316	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	20.8	18.8	
HCM LOS	C	C	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	-	-	-	270	279
HCM Lane V/C Ratio	-	-	-	0.157	0.062
HCM Control Delay (s)	-	-	-	20.8	18.8
HCM Lane LOS	-	-	-	C	C
HCM 95th %tile Q(veh)	-	-	-	0.5	0.2

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	31	49	0	0	11	40	35	830	14	0	0	0
Future Vol, veh/h	31	49	0	0	11	40	35	830	14	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	75	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	1081	921	536	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	34	53	0	0	12	43	38	902	15	0	0	0

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	533	993	-	-	978	451	0	0	0
Stage 1	0	0	-	-	978	-	-	-	-
Stage 2	533	993	-	-	0	-	-	-	-
Critical Hdwy	7.54	6.54	-	-	6.54	6.94	4.14	-	-
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	-	-	4.02	3.32	2.22	-	-
Pot Cap-1 Maneuver	430	244	0	0	249	556	-	-	-
Stage 1	-	-	0	0	327	-	-	-	-
Stage 2	498	322	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	382	244	-	-	249	556	-	-	-
Mov Cap-2 Maneuver	382	244	-	-	249	-	-	-	-
Stage 1	-	-	-	-	327	-	-	-	-
Stage 2	442	322	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	23.2	14.4	
HCM LOS	C	B	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	-	-	-	284	439
HCM Lane V/C Ratio	-	-	-	0.306	0.126
HCM Control Delay (s)	-	-	-	23.2	14.4
HCM Lane LOS	-	-	-	C	B
HCM 95th %tile Q(veh)	-	-	-	1.3	0.4

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	21	54	21	49	0	0	0	0	23	666	7
Future Vol, veh/h	0	21	54	21	49	0	0	0	0	23	666	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	23	59	23	53	0	0	0	0	25	724	8

Major/Minor	Minor2			Minor1					Major2		
Conflicting Flow All	-	778	366	424	782	-			0	0	0
Stage 1	-	778	-	0	0	-			-	-	-
Stage 2	-	0	-	424	782	-			-	-	-
Critical Hdwy	-	6.54	6.94	7.54	6.54	-			4.14	-	-
Critical Hdwy Stg 1	-	5.54	-	-	-	-			-	-	-
Critical Hdwy Stg 2	-	-	-	6.54	5.54	-			-	-	-
Follow-up Hdwy	-	4.02	3.32	3.52	4.02	-			2.22	-	-
Pot Cap-1 Maneuver	0	326	631	514	324	0			-	-	-
Stage 1	0	405	-	-	-	0			-	-	-
Stage 2	0	-	-	578	403	0			-	-	-
Platoon blocked, %										-	-
Mov Cap-1 Maneuver	-	326	631	446	324	-			-	-	-
Mov Cap-2 Maneuver	-	391	-	457	391	-			-	-	-
Stage 1	-	405	-	-	-	-			-	-	-
Stage 2	-	-	-	495	403	-			-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	12.9	15.8	
HCM LOS	B	C	

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	538	409	-	-	-
HCM Lane V/C Ratio	0.152	0.186	-	-	-
HCM Control Delay (s)	12.9	15.8	-	-	-
HCM Lane LOS	B	C	-	-	-
HCM 95th %tile Q(veh)	0.5	0.7	-	-	-

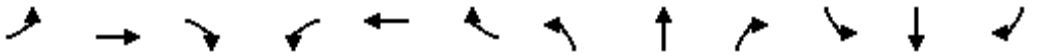
Intersection	
Int Delay, s/veh	6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	55	142	48	45	0	0	0	0	54	1005	2
Future Vol, veh/h	0	55	142	48	45	0	0	0	0	54	1005	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	60	154	52	49	0	0	0	0	59	1092	2

Major/Minor	Minor2			Minor1					Major2		
Conflicting Flow All	-	1211	547	694	1212	-			0	0	0
Stage 1	-	1211	-	0	0	-			-	-	-
Stage 2	-	0	-	694	1212	-			-	-	-
Critical Hdwy	-	6.54	6.94	7.54	6.54	-			4.14	-	-
Critical Hdwy Stg 1	-	5.54	-	-	-	-			-	-	-
Critical Hdwy Stg 2	-	-	-	6.54	5.54	-			-	-	-
Follow-up Hdwy	-	4.02	3.32	3.52	4.02	-			2.22	-	-
Pot Cap-1 Maneuver	0	181	481	329	181	0			-	-	-
Stage 1	0	253	-	-	-	0			-	-	-
Stage 2	0	-	-	399	253	0			-	-	-
Platoon blocked, %										-	-
Mov Cap-1 Maneuver	-	181	481	184	181	-			-	-	-
Mov Cap-2 Maneuver	-	259	-	192	274	-			-	-	-
Stage 1	-	253	-	-	-	-			-	-	-
Stage 2	-	-	-	207	253	-			-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	25.1	33.4	
HCM LOS	D	D	

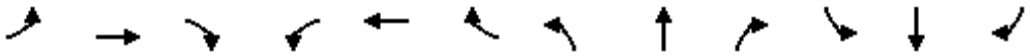
Minor Lane/Major Mvmt	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	388	225	-	-	-
HCM Lane V/C Ratio	0.552	0.449	-	-	-
HCM Control Delay (s)	25.1	33.4	-	-	-
HCM Lane LOS	D	D	-	-	-
HCM 95th %tile Q(veh)	3.2	2.1	-	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	27	27	25	77	34	111	1123	5	8	1022	170
Future Volume (veh/h)	170	27	27	25	77	34	111	1123	5	8	1022	170
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1667	1667	1736	1736	1736	1736	1723	1723	1723	1682	1682	1682
Adj Flow Rate, veh/h	195	31	31	29	89	39	128	1291	6	9	1175	195
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	1	1	1	1	1	1	2	2	2	5	5	5
Cap, veh/h	343	161	161	95	220	85	280	1983	9	257	1487	246
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.06	0.59	0.59	0.01	0.54	0.54
Sat Flow, veh/h	1222	765	765	172	1041	401	1641	3341	16	1602	2744	453
Grp Volume(v), veh/h	195	0	62	157	0	0	128	632	665	9	682	688
Grp Sat Flow(s),veh/h/ln	1222	0	1529	1615	0	0	1641	1637	1720	1602	1598	1600
Q Serve(g_s), s	5.9	0.0	2.4	0.0	0.0	0.0	2.3	18.8	18.8	0.2	25.0	25.4
Cycle Q Clear(g_c), s	11.9	0.0	2.4	6.0	0.0	0.0	2.3	18.8	18.8	0.2	25.0	25.4
Prop In Lane	1.00		0.50	0.18		0.25	1.00		0.01	1.00		0.28
Lane Grp Cap(c), veh/h	343	0	322	399	0	0	280	972	1021	257	866	867
V/C Ratio(X)	0.57	0.00	0.19	0.39	0.00	0.00	0.46	0.65	0.65	0.04	0.79	0.79
Avail Cap(c_a), veh/h	751	0	834	928	0	0	847	1116	1173	894	1089	1091
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.7	0.0	23.8	25.2	0.0	0.0	12.9	9.9	9.9	8.9	13.4	13.5
Incr Delay (d2), s/veh	1.5	0.0	0.3	0.6	0.0	0.0	0.4	1.1	1.0	0.0	3.1	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	5.6	0.0	1.6	4.3	0.0	0.0	1.7	9.2	9.6	0.1	12.4	12.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.2	0.0	24.1	25.8	0.0	0.0	13.3	11.0	10.9	8.9	16.5	16.8
LnGrp LOS	C	A	C	C	A	A	B	B	B	A	B	B
Approach Vol, veh/h		257			157			1425			1379	
Approach Delay, s/veh		28.0			25.8			11.2			16.6	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.8	49.0		20.5	7.6	45.2		20.5				
Change Period (Y+Rc), s	3.0	5.5		5.0	3.0	5.5		5.0				
Max Green Setting (Gmax), s	30.0	50.0		40.0	30.0	50.0		40.0				
Max Q Clear Time (g_c+I1), s	2.2	20.8		13.9	4.3	27.4		8.0				
Green Ext Time (p_c), s	0.0	19.2		1.6	0.1	12.4		0.9				

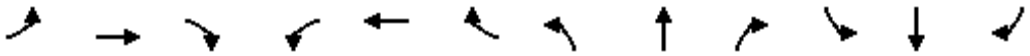
Intersection Summary			
HCM 6th Ctrl Delay		15.5	
HCM 6th LOS		B	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	205	49	56	13	12	20	57	1194	21	29	1188	90
Future Volume (veh/h)	205	49	56	13	12	20	57	1194	21	29	1188	90
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1680	1680	1750	1750	1750	1750	1709	1709	1709	1723	1723	1723
Adj Flow Rate, veh/h	211	51	58	13	12	21	59	1231	22	30	1225	93
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	3	3	3	2	2	2
Cap, veh/h	381	144	164	124	111	140	291	1858	33	294	1701	129
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.05	0.57	0.57	0.03	0.55	0.55
Sat Flow, veh/h	1342	717	816	280	551	698	1628	3264	58	1641	3083	234
Grp Volume(v), veh/h	211	0	109	46	0	0	59	612	641	30	649	669
Grp Sat Flow(s),veh/h/ln	1342	0	1533	1529	0	0	1628	1624	1699	1641	1637	1681
Q Serve(g_s), s	8.2	0.0	4.2	0.0	0.0	0.0	1.0	17.8	17.8	0.5	20.1	20.2
Cycle Q Clear(g_c), s	9.8	0.0	4.2	1.6	0.0	0.0	1.0	17.8	17.8	0.5	20.1	20.2
Prop In Lane	1.00		0.53	0.28		0.46	1.00		0.03	1.00		0.14
Lane Grp Cap(c), veh/h	381	0	308	375	0	0	291	924	967	294	903	927
V/C Ratio(X)	0.55	0.00	0.35	0.12	0.00	0.00	0.20	0.66	0.66	0.10	0.72	0.72
Avail Cap(c_a), veh/h	899	0	900	948	0	0	928	1191	1246	964	1201	1233
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.6	0.0	23.4	22.4	0.0	0.0	9.1	10.2	10.2	8.2	11.4	11.4
Incr Delay (d2), s/veh	1.3	0.0	0.7	0.1	0.0	0.0	0.1	0.9	0.9	0.1	1.4	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	5.5	0.0	2.7	1.1	0.0	0.0	0.5	8.7	9.0	0.3	9.9	10.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.8	0.0	24.1	22.5	0.0	0.0	9.2	11.1	11.0	8.2	12.8	12.8
LnGrp LOS	C	A	C	C	A	A	A	B	B	A	B	B
Approach Vol, veh/h		320			46			1312			1348	
Approach Delay, s/veh		25.9			22.5			11.0			12.7	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.2	44.3		18.7	6.4	43.1		18.7				
Change Period (Y+Rc), s	3.0	5.5		5.0	3.0	5.5		5.0				
Max Green Setting (Gmax), s	30.0	50.0		40.0	30.0	50.0		40.0				
Max Q Clear Time (g_c+I1), s	2.5	19.8		11.8	3.0	22.2		3.6				
Green Ext Time (p_c), s	0.0	19.0		1.9	0.1	13.0		0.2				

Intersection Summary			
HCM 6th Ctrl Delay		13.5	
HCM 6th LOS		B	

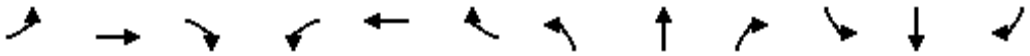


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	165	68	317	840	273	0	0	0
Future Volume (veh/h)	0	0	0	0	165	68	317	840	273	0	0	0
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach					No			No				
Adj Sat Flow, veh/h/ln				0	1514	1514	1526	1526	1526			
Adj Flow Rate, veh/h				0	201	83	387	1024	206			
Peak Hour Factor				0.82	0.82	0.82	0.82	0.82	0.82			
Percent Heavy Veh, %				0	5	5	4	4	4			
Cap, veh/h				0	860	343	726	1308	554			
Arrive On Green				0.00	0.43	0.43	0.14	0.14	0.14			
Sat Flow, veh/h				0	2083	800	1453	3052	1293			
Grp Volume(v), veh/h				0	142	142	387	1024	206			
Grp Sat Flow(s),veh/h/ln				0	1438	1369	1453	1526	1293			
Q Serve(g_s), s				0.0	4.4	4.6	17.5	22.7	10.1			
Cycle Q Clear(g_c), s				0.0	4.4	4.6	17.5	22.7	10.1			
Prop In Lane				0.00		0.58	1.00		1.00			
Lane Grp Cap(c), veh/h				0	616	587	726	1308	554			
V/C Ratio(X)				0.00	0.23	0.24	0.53	0.78	0.37			
Avail Cap(c_a), veh/h				0	616	587	726	1308	554			
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	0.33			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh				0.0	12.7	12.8	24.7	26.9	21.5			
Incr Delay (d2), s/veh				0.0	0.9	1.0	2.8	4.7	1.9			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(90%),veh/ln				0.0	2.7	2.7	10.7	14.0	6.2			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				0.0	13.6	13.7	27.5	31.6	23.4			
LnGrp LOS				A	B	B	C	C	C			
Approach Vol, veh/h					284			1617				
Approach Delay, s/veh					13.6			29.6				
Approach LOS					B			C				
Timer - Assigned Phs						6		8				
Phs Duration (G+Y+Rc), s						35.0		35.0				
Change Period (Y+Rc), s						5.0		5.0				
Max Green Setting (Gmax), s						30.0		30.0				
Max Q Clear Time (g_c+I1), s						24.7		6.6				
Green Ext Time (p_c), s						4.8		0.9				

Intersection Summary	
HCM 6th Ctrl Delay	27.2
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

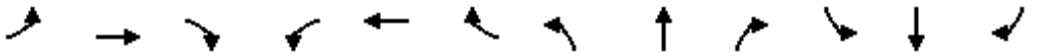


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	344	71	749	806	219	0	0	0
Future Volume (veh/h)	0	0	0	0	344	71	749	806	219	0	0	0
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach					No			No				
Adj Sat Flow, veh/h/ln				0	1550	1550	1563	1563	1563			
Adj Flow Rate, veh/h				0	358	74	540	1176	141			
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %				0	2	2	1	1	1			
Cap, veh/h				0	939	192	804	1473	624			
Arrive On Green				0.00	0.39	0.39	0.16	0.16	0.16			
Sat Flow, veh/h				0	2513	498	1488	3125	1324			
Grp Volume(v), veh/h				0	215	217	540	1176	141			
Grp Sat Flow(s),veh/h/ln				0	1473	1461	1488	1563	1324			
Q Serve(g_s), s				0.0	7.3	7.5	24.4	25.4	6.5			
Cycle Q Clear(g_c), s				0.0	7.3	7.5	24.4	25.4	6.5			
Prop In Lane				0.00		0.34	1.00		1.00			
Lane Grp Cap(c), veh/h				0	568	563	804	1473	624			
V/C Ratio(X)				0.00	0.38	0.39	0.67	0.80	0.23			
Avail Cap(c_a), veh/h				0	568	563	804	1473	624			
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	0.33			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh				0.0	15.5	15.5	25.9	26.3	18.4			
Incr Delay (d2), s/veh				0.0	1.9	2.0	4.4	4.6	0.8			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(90%),veh/ln				0.0	4.7	4.8	14.7	15.7	4.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				0.0	17.4	17.5	30.3	30.9	19.2			
LnGrp LOS				A	B	B	C	C	B			
Approach Vol, veh/h					432			1857				
Approach Delay, s/veh					17.4			29.9				
Approach LOS					B			C				
Timer - Assigned Phs						6		8				
Phs Duration (G+Y+Rc), s						38.0		32.0				
Change Period (Y+Rc), s						5.0		5.0				
Max Green Setting (Gmax), s						33.0		27.0				
Max Q Clear Time (g_c+I1), s						27.4		9.5				
Green Ext Time (p_c), s						5.3		1.4				

Intersection Summary	
HCM 6th Ctrl Delay	27.5
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.



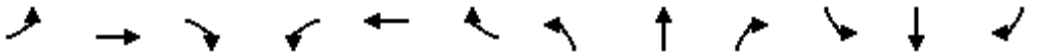
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	79	403	0	0	0	0	0	658	62
Future Volume (veh/h)	0	0	0	79	403	0	0	0	0	0	658	62
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach					No						No	
Adj Sat Flow, veh/h/ln				1514	1514	0				0	1526	1526
Adj Flow Rate, veh/h				86	438	0				0	715	42
Peak Hour Factor				0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %				5	5	0				0	4	4
Cap, veh/h				741	1341	0				0	1201	536
Arrive On Green				0.15	0.15	0.00				0.00	0.14	0.14
Sat Flow, veh/h				1441	3027	0				0	2975	1293
Grp Volume(v), veh/h				86	438	0				0	715	42
Grp Sat Flow(s),veh/h/ln				1441	1514	0				0	1450	1293
Q Serve(g_s), s				3.6	9.1	0.0				0.0	16.2	2.0
Cycle Q Clear(g_c), s				3.6	9.1	0.0				0.0	16.2	2.0
Prop In Lane				1.00		0.00				0.00		1.00
Lane Grp Cap(c), veh/h				741	1341	0				0	1201	536
V/C Ratio(X)				0.12	0.33	0.00				0.00	0.60	0.08
Avail Cap(c_a), veh/h				741	1341	0				0	1201	536
HCM Platoon Ratio				0.33	0.33	1.00				1.00	0.33	0.33
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				18.2	20.5	0.0				0.0	24.7	18.6
Incr Delay (d2), s/veh				0.3	0.7	0.0				0.0	2.2	0.3
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln				2.2	6.1	0.0				0.0	9.8	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				18.5	21.2	0.0				0.0	26.9	18.8
LnGrp LOS				B	C	A				A	C	B
Approach Vol, veh/h					524						757	
Approach Delay, s/veh					20.7						26.4	
Approach LOS					C						C	

Timer - Assigned Phs	2							8				
Phs Duration (G+Y+Rc), s	34.0							36.0				
Change Period (Y+Rc), s	5.0							5.0				
Max Green Setting (Gmax), s	29.0							31.0				
Max Q Clear Time (g_c+I1), s	18.2							11.1				
Green Ext Time (p_c), s	5.8							1.9				

Intersection Summary		
HCM 6th Ctrl Delay	24.1	
HCM 6th LOS	C	

Notes

User approved volume balancing among the lanes for turning movement.



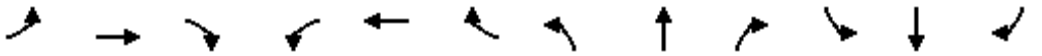
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	95	1017	0	0	0	0	0	740	460
Future Volume (veh/h)	0	0	0	95	1017	0	0	0	0	0	740	460
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach					No						No	
Adj Sat Flow, veh/h/ln				1563	1563	0				0	1563	1563
Adj Flow Rate, veh/h				101	1082	0				0	787	303
Peak Hour Factor				0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %				1	1	0				0	1	1
Cap, veh/h				847	1563	0				0	1060	473
Arrive On Green				0.17	0.17	0.00				0.00	0.12	0.12
Sat Flow, veh/h				1488	3125	0				0	3047	1324
Grp Volume(v), veh/h				101	1082	0				0	787	303
Grp Sat Flow(s),veh/h/ln				1488	1563	0				0	1485	1324
Q Serve(g_s), s				4.1	22.8	0.0				0.0	17.9	15.3
Cycle Q Clear(g_c), s				4.1	22.8	0.0				0.0	17.9	15.3
Prop In Lane				1.00		0.00				0.00		1.00
Lane Grp Cap(c), veh/h				847	1563	0				0	1060	473
V/C Ratio(X)				0.12	0.69	0.00				0.00	0.74	0.64
Avail Cap(c_a), veh/h				847	1563	0				0	1060	473
HCM Platoon Ratio				0.33	0.33	1.00				1.00	0.33	0.33
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				16.3	24.2	0.0				0.0	27.8	26.6
Incr Delay (d2), s/veh				0.3	2.5	0.0				0.0	4.7	6.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln				2.5	14.0	0.0				0.0	11.3	9.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				16.6	26.7	0.0				0.0	32.5	33.1
LnGrp LOS				B	C	A				A	C	C
Approach Vol, veh/h					1183						1090	
Approach Delay, s/veh					25.8						32.6	
Approach LOS					C						C	

Timer - Assigned Phs	2							8				
Phs Duration (G+Y+Rc), s	30.0							40.0				
Change Period (Y+Rc), s	5.0							5.0				
Max Green Setting (Gmax), s	25.0							35.0				
Max Q Clear Time (g_c+I1), s	19.9							24.8				
Green Ext Time (p_c), s	3.9							3.9				

Intersection Summary	
HCM 6th Ctrl Delay	29.1
HCM 6th LOS	C

Notes

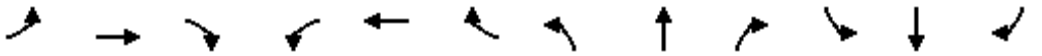
User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	63	31	87	175	94	60	776	18	44	905	41
Future Volume (veh/h)	56	63	31	87	175	94	60	776	18	44	905	41
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1709	1709	1709	1736	1736	1736	1695	1695	1695	1709	1709	1709
Adj Flow Rate, veh/h	62	70	34	97	194	104	67	862	20	49	1006	46
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	1	1	1	4	4	4	3	3	3
Cap, veh/h	206	284	138	376	278	149	303	1685	39	392	1630	75
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.05	0.52	0.52	0.01	0.17	0.17
Sat Flow, veh/h	1073	1086	528	1300	1064	570	1615	3218	75	1628	3162	145
Grp Volume(v), veh/h	62	0	104	97	0	298	67	431	451	49	517	535
Grp Sat Flow(s),veh/h/ln	1073	0	1614	1300	0	1634	1615	1611	1682	1628	1624	1683
Q Serve(g_s), s	3.9	0.0	3.6	4.5	0.0	11.5	1.3	12.2	12.2	1.0	20.6	20.7
Cycle Q Clear(g_c), s	15.4	0.0	3.6	8.0	0.0	11.5	1.3	12.2	12.2	1.0	20.6	20.7
Prop In Lane	1.00		0.33	1.00		0.35	1.00		0.04	1.00		0.09
Lane Grp Cap(c), veh/h	206	0	421	376	0	426	303	843	881	392	837	868
V/C Ratio(X)	0.30	0.00	0.25	0.26	0.00	0.70	0.22	0.51	0.51	0.12	0.62	0.62
Avail Cap(c_a), veh/h	301	0	565	492	0	572	404	843	881	623	837	868
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.71	0.71	0.71
Uniform Delay (d), s/veh	30.3	0.0	20.4	23.6	0.0	23.4	10.3	10.8	10.8	8.3	22.6	22.6
Incr Delay (d2), s/veh	1.7	0.0	0.6	0.8	0.0	4.6	0.5	2.2	2.1	0.1	2.4	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	1.9	0.0	2.5	2.5	0.0	7.6	0.8	7.1	7.3	0.6	12.7	13.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.1	0.0	21.1	24.4	0.0	28.0	10.8	13.1	13.0	8.4	25.1	25.0
LnGrp LOS	C	A	C	C	A	C	B	B	B	A	C	C
Approach Vol, veh/h		166			395			949			1101	
Approach Delay, s/veh		25.2			27.1			12.9			24.3	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	40.6		22.8	6.1	41.2		22.8				
Change Period (Y+Rc), s	3.0	4.5		4.5	3.0	4.5		4.5				
Max Green Setting (Gmax), s	8.0	25.5		24.5	13.0	20.5		24.5				
Max Q Clear Time (g_c+I1), s	3.3	0.0		17.4	3.0	0.0		13.5				
Green Ext Time (p_c), s	0.1	0.0		0.8	0.1	0.0		3.2				

Intersection Summary												
HCM 6th Ctrl Delay			20.6									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	189	106	38	138	64	55	1033	67	73	914	71
Future Volume (veh/h)	106	189	106	38	138	64	55	1033	67	73	914	71
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1736	1736	1723	1723	1723	1723	1723	1723	1736	1736	1736
Adj Flow Rate, veh/h	110	197	110	40	144	67	57	1076	70	76	952	74
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	2	2	2	2	2	2	1	1	1
Cap, veh/h	266	271	151	183	288	134	353	1685	110	322	1694	132
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.04	0.54	0.54	0.05	0.55	0.55
Sat Flow, veh/h	1180	1047	584	1072	1112	517	1641	3120	203	1654	3101	241
Grp Volume(v), veh/h	110	0	307	40	0	211	57	564	582	76	506	520
Grp Sat Flow(s),veh/h/ln	1180	0	1631	1072	0	1630	1641	1637	1686	1654	1650	1693
Q Serve(g_s), s	7.0	0.0	13.7	2.8	0.0	8.8	1.2	19.4	19.4	1.6	16.1	16.1
Cycle Q Clear(g_c), s	15.8	0.0	13.7	16.6	0.0	8.8	1.2	19.4	19.4	1.6	16.1	16.1
Prop In Lane	1.00		0.36	1.00		0.32	1.00		0.12	1.00		0.14
Lane Grp Cap(c), veh/h	266	0	422	183	0	422	353	884	911	322	901	925
V/C Ratio(X)	0.41	0.00	0.73	0.22	0.00	0.50	0.16	0.64	0.64	0.24	0.56	0.56
Avail Cap(c_a), veh/h	351	0	540	261	0	540	444	884	911	506	901	925
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.79	0.79	0.79
Uniform Delay (d), s/veh	32.0	0.0	27.1	34.6	0.0	25.2	8.8	12.9	12.9	9.8	11.9	11.9
Incr Delay (d2), s/veh	2.2	0.0	5.8	1.3	0.0	2.0	0.3	3.5	3.4	0.4	2.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	3.8	0.0	9.0	1.4	0.0	6.0	0.7	10.8	11.1	1.0	8.7	8.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.2	0.0	32.9	35.9	0.0	27.2	9.1	16.4	16.3	10.2	13.9	13.8
LnGrp LOS	C	A	C	D	A	C	A	B	B	B	B	B
Approach Vol, veh/h		417			251			1203			1102	
Approach Delay, s/veh		33.2			28.6			16.0			13.6	
Approach LOS		C			C			B			B	

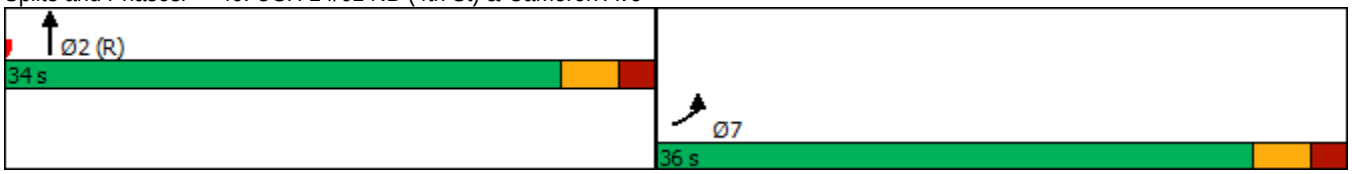
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	48.2		25.2	7.1	47.7		25.2				
Change Period (Y+Rc), s	3.0	4.5		4.5	3.0	4.5		4.5				
Max Green Setting (Gmax), s	8.0	33.5		26.5	13.0	28.5		26.5				
Max Q Clear Time (g_c+I1), s	3.2	0.0		17.8	3.6	0.0		18.6				
Green Ext Time (p_c), s	0.1	0.0		2.9	0.2	0.0		1.5				

Intersection Summary			
HCM 6th Ctrl Delay		18.6	
HCM 6th LOS		B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	495	0	0	0	0	0	0	938	27	0	0	0
Future Volume (vph)	495	0	0	0	0	0	0	938	27	0	0	0
Satd. Flow (prot)	2874	0	0	0	0	0	0	5145	0	0	0	0
Flt Permitted	0.950											
Satd. Flow (perm)	2874	0	0	0	0	0	0	5145	0	0	0	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	611	0	0	0	0	0	0	1179	0	0	0	0
Turn Type	Prot							NA				
Protected Phases	7							2				
Permitted Phases												
Total Split (s)	36.0							34.0				
Total Lost Time (s)	5.0							5.0				
Act Effct Green (s)	31.0							29.0				
Actuated g/C Ratio	0.44							0.41				
v/c Ratio	0.48							0.55				
Control Delay	9.0							16.8				
Queue Delay	0.0							0.0				
Total Delay	9.0							16.8				
LOS	A							B				
Approach Delay		9.0						16.8				
Approach LOS		A						B				
Queue Length 50th (ft)	37							108				
Queue Length 95th (ft)	45							120				
Internal Link Dist (ft)		321			421			1044			293	
Turn Bay Length (ft)												
Base Capacity (vph)	1272							2131				
Starvation Cap Reductn	0							0				
Spillback Cap Reductn	0							60				
Storage Cap Reductn	0							0				
Reduced v/c Ratio	0.48							0.57				

Intersection Summary		
Cycle Length: 70		
Actuated Cycle Length: 70		
Offset: 2 (3%), Referenced to phase 2:NBT and 6:, Start of 1st Green		
Control Type: Pretimed		
Maximum v/c Ratio: 0.55		
Intersection Signal Delay: 14.2	Intersection LOS: B	
Intersection Capacity Utilization 120.1%	ICU Level of Service H	
Analysis Period (min) 15		

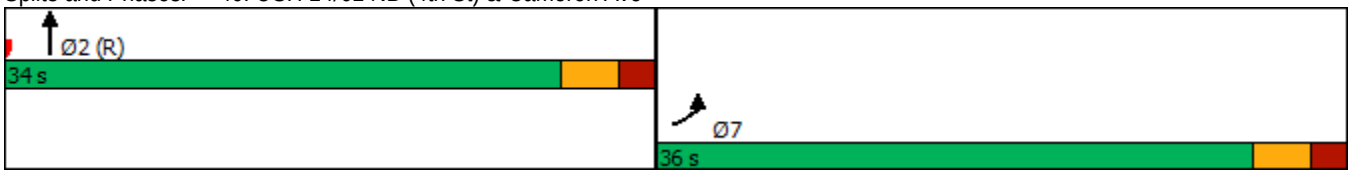
Splits and Phases: 46: USH 14/61 NB (4th St) & Cameron Ave

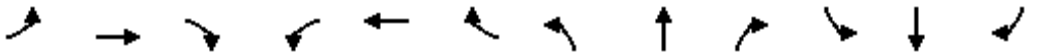


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	288	0	0	0	0	0	0	1474	26	0	0	0
Future Volume (vph)	288	0	0	0	0	0	0	1474	26	0	0	0
Satd. Flow (prot)	2874	0	0	0	0	0	0	5354	0	0	0	0
Flt Permitted	0.950											
Satd. Flow (perm)	2874	0	0	0	0	0	0	5354	0	0	0	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	297	0	0	0	0	0	0	1537	0	0	0	0
Turn Type	Prot							NA				
Protected Phases	7							2				
Permitted Phases												
Total Split (s)	36.0							34.0				
Total Lost Time (s)	5.0							5.0				
Act Effct Green (s)	31.0							29.0				
Actuated g/C Ratio	0.44							0.41				
v/c Ratio	0.23							0.69				
Control Delay	9.0							18.9				
Queue Delay	0.0							0.0				
Total Delay	9.0							18.9				
LOS	A							B				
Approach Delay		9.0						18.9				
Approach LOS		A						B				
Queue Length 50th (ft)	26							152				
Queue Length 95th (ft)	37							191				
Internal Link Dist (ft)		321			421			1044			293	
Turn Bay Length (ft)												
Base Capacity (vph)	1272							2218				
Starvation Cap Reductn	0							0				
Spillback Cap Reductn	0							0				
Storage Cap Reductn	0							0				
Reduced v/c Ratio	0.23							0.69				

Intersection Summary			
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 2 (3%), Referenced to phase 2:NBT and 6:, Start of 1st Green			
Control Type: Pretimed			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 17.3		Intersection LOS: B	
Intersection Capacity Utilization 90.3%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 46: USH 14/61 NB (4th St) & Cameron Ave

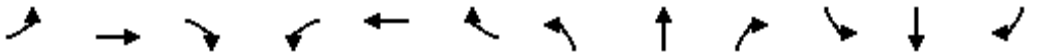




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	490	845	0	0	0	0	0	0	15	707	0
Future Volume (veh/h)	0	490	845	0	0	0	0	0	0	15	707	0
Initial Q (Qb), veh	0	0	0							0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00							1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00							1.00	1.00	1.00
Work Zone On Approach		No									No	
Adj Sat Flow, veh/h/ln	0	1550	1550							1538	1538	0
Adj Flow Rate, veh/h	0	590	631							18	852	0
Peak Hour Factor	0.83	0.83	0.83							0.83	0.83	0.83
Percent Heavy Veh, %	0	2	2							3	3	0
Cap, veh/h	0	1515	676							605	1002	0
Arrive On Green	0.00	0.51	0.51							0.11	0.11	0.00
Sat Flow, veh/h	0	3023	1314							1465	2999	0
Grp Volume(v), veh/h	0	590	631							18	852	0
Grp Sat Flow(s),veh/h/ln	0	1473	1314							1465	1461	0
Q Serve(g_s), s	0.0	8.5	31.4							0.8	20.0	0.0
Cycle Q Clear(g_c), s	0.0	8.5	31.4							0.8	20.0	0.0
Prop In Lane	0.00		1.00							1.00		0.00
Lane Grp Cap(c), veh/h	0	1515	676							605	1002	0
V/C Ratio(X)	0.00	0.39	0.93							0.03	0.85	0.00
Avail Cap(c_a), veh/h	0	1515	676							605	1002	0
HCM Platoon Ratio	1.00	1.00	1.00							0.33	0.33	1.00
Upstream Filter(I)	0.00	1.00	1.00							1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	10.3	15.9							20.7	29.3	0.0
Incr Delay (d2), s/veh	0.0	0.8	21.7							0.1	9.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0							0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	0.0	4.7	16.8							0.5	12.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	11.1	37.6							20.8	38.3	0.0
LnGrp LOS	A	B	D							C	D	A
Approach Vol, veh/h		1221									870	
Approach Delay, s/veh		24.8									37.9	
Approach LOS		C									D	

Timer - Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		29.0		41.0								
Change Period (Y+Rc), s		5.0		5.0								
Max Green Setting (Gmax), s		24.0		36.0								
Max Q Clear Time (g_c+I1), s		22.0		33.4								
Green Ext Time (p_c), s		1.4		1.5								

Intersection Summary												
HCM 6th Ctrl Delay			30.3									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	205	346	0	0	0	0	0	0	43	776	0
Future Volume (veh/h)	0	205	346	0	0	0	0	0	0	43	776	0
Initial Q (Qb), veh	0	0	0							0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00							1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00							1.00	1.00	1.00
Work Zone On Approach		No									No	
Adj Sat Flow, veh/h/ln	0	1538	1538							1550	1550	0
Adj Flow Rate, veh/h	0	218	228							46	826	0
Peak Hour Factor	0.94	0.94	0.94							0.94	0.94	0.94
Percent Heavy Veh, %	0	3	3							2	2	0
Cap, veh/h	0	1294	577							715	1220	0
Arrive On Green	0.00	0.44	0.44							0.14	0.14	0.00
Sat Flow, veh/h	0	2999	1304							1477	3023	0
Grp Volume(v), veh/h	0	218	228							46	826	0
Grp Sat Flow(s),veh/h/ln	0	1461	1304							1477	1473	0
Q Serve(g_s), s	0.0	3.1	8.3							1.9	18.7	0.0
Cycle Q Clear(g_c), s	0.0	3.1	8.3							1.9	18.7	0.0
Prop In Lane	0.00		1.00							1.00		0.00
Lane Grp Cap(c), veh/h	0	1294	577							715	1220	0
V/C Ratio(X)	0.00	0.17	0.39							0.06	0.68	0.00
Avail Cap(c_a), veh/h	0	1294	577							715	1220	0
HCM Platoon Ratio	1.00	1.00	1.00							0.33	0.33	1.00
Upstream Filter(I)	0.00	1.00	1.00							1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	11.7	13.2							18.5	25.8	0.0
Incr Delay (d2), s/veh	0.0	0.3	2.0							0.2	3.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0							0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	0.0	1.8	4.6							1.2	11.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	12.0	15.2							18.7	28.8	0.0
LnGrp LOS	A	B	B							B	C	A
Approach Vol, veh/h		446									872	
Approach Delay, s/veh		13.6									28.3	
Approach LOS		B									C	

Timer - Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		34.0		36.0								
Change Period (Y+Rc), s		5.0		5.0								
Max Green Setting (Gmax), s		29.0		31.0								
Max Q Clear Time (g_c+I1), s		20.7		10.3								
Green Ext Time (p_c), s		5.3		1.7								

Intersection Summary												
HCM 6th Ctrl Delay			23.3									
HCM 6th LOS			C									

Intersection	
Int Delay, s/veh	13.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	39	15	80	39	0	0	0	0	80	1333	14
Future Vol, veh/h	0	39	15	80	39	0	0	0	0	80	1333	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	42	16	87	42	0	0	0	0	87	1449	15

Major/Minor	Minor2			Minor1					Major2		
Conflicting Flow All	-	1631	732	920	1638	-			0	0	0
Stage 1	-	1631	-	0	0	-			-	-	-
Stage 2	-	0	-	920	1638	-			-	-	-
Critical Hdwy	-	6.54	6.94	7.54	6.54	-			4.14	-	-
Critical Hdwy Stg 1	-	5.54	-	-	-	-			-	-	-
Critical Hdwy Stg 2	-	-	-	6.54	5.54	-			-	-	-
Follow-up Hdwy	-	4.02	3.32	3.52	4.02	-			2.22	-	-
Pot Cap-1 Maneuver	0	101	364	226	100	0			-	-	-
Stage 1	0	158	-	-	-	0			-	-	-
Stage 2	0	-	-	292	157	0			-	-	-
Platoon blocked, %										-	-
Mov Cap-1 Maneuver	-	101	364	145	100	-			-	-	-
Mov Cap-2 Maneuver	-	101	-	145	100	-			-	-	-
Stage 1	-	158	-	-	-	-			-	-	-
Stage 2	-	-	-	204	157	-			-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	56.3	154.6	
HCM LOS	F	F	

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	126	126	-	-	-
HCM Lane V/C Ratio	0.466	1.027	-	-	-
HCM Control Delay (s)	56.3	154.6	-	-	-
HCM Lane LOS	F	F	-	-	-
HCM 95th %tile Q(veh)	2.1	7.2	-	-	-

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	29	52	58	29	0	0	0	0	58	1074	13
Future Vol, veh/h	0	29	52	58	29	0	0	0	0	58	1074	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	32	57	63	32	0	0	0	0	63	1167	14

Major/Minor	Minor2			Minor1					Major2		
Conflicting Flow All	-	1300	591	726	1307	-			0	0	0
Stage 1	-	1300	-	0	0	-			-	-	-
Stage 2	-	0	-	726	1307	-			-	-	-
Critical Hdwy	-	6.54	6.94	7.54	6.54	-			4.14	-	-
Critical Hdwy Stg 1	-	5.54	-	-	-	-			-	-	-
Critical Hdwy Stg 2	-	-	-	6.54	5.54	-			-	-	-
Follow-up Hdwy	-	4.02	3.32	3.52	4.02	-			2.22	-	-
Pot Cap-1 Maneuver	0	160	450	312	158	0			-	-	-
Stage 1	0	230	-	-	-	0			-	-	-
Stage 2	0	-	-	382	228	0			-	-	-
Platoon blocked, %										-	-
Mov Cap-1 Maneuver	-	160	450	232	158	-			-	-	-
Mov Cap-2 Maneuver	-	160	-	232	158	-			-	-	-
Stage 1	-	230	-	-	-	-			-	-	-
Stage 2	-	-	-	288	228	-			-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	24.3	37.9	
HCM LOS	C	E	

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	273	201	-	-	-
HCM Lane V/C Ratio	0.323	0.47	-	-	-
HCM Control Delay (s)	24.3	37.9	-	-	-
HCM Lane LOS	C	E	-	-	-
HCM 95th %tile Q(veh)	1.3	2.3	-	-	-

Intersection	
Int Delay, s/veh	19.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	59	59	0	0	147	50	50	917	41	0	0	0
Future Vol, veh/h	59	59	0	0	147	50	50	917	41	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	64	64	0	0	160	54	54	997	45	0	0	0

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	587	1150	-	-	1128	521	0	0	0
Stage 1	0	0	-	-	1128	-	-	-	-
Stage 2	587	1150	-	-	0	-	-	-	-
Critical Hdwy	6.44	6.54	-	-	6.54	7.14	5.34	-	-
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	-	-	4.02	3.92	3.12	-	-
Pot Cap-1 Maneuver	443	197	0	0	203	428	-	-	-
Stage 1	-	-	0	0	278	-	-	-	-
Stage 2	422	271	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	135	197	-	-	203	428	-	-	-
Mov Cap-2 Maneuver	135	197	-	-	203	-	-	-	-
Stage 1	-	-	-	-	278	-	-	-	-
Stage 2	157	271	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	83.4	83.1	
HCM LOS	F	F	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	-	-	-	160	234
HCM Lane V/C Ratio	-	-	-	0.802	0.915
HCM Control Delay (s)	-	-	-	83.4	83.1
HCM Lane LOS	-	-	-	F	F
HCM 95th %tile Q(veh)	-	-	-	5.2	7.8

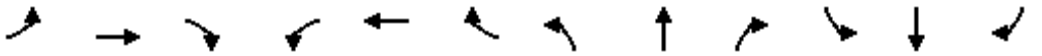
Intersection	
Int Delay, s/veh	27.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	44	44	0	0	72	93	93	1317	21	0	0	0
Future Vol, veh/h	44	44	0	0	72	93	93	1317	21	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	48	48	0	0	78	101	101	1432	23	0	0	0

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	814	1657	-	-	1646	728	0	0	0
Stage 1	0	0	-	-	1646	-	-	-	-
Stage 2	814	1657	-	-	0	-	-	-	-
Critical Hdwy	6.44	6.54	-	-	6.54	7.14	5.34	-	-
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	-	-	4.02	3.92	3.12	-	-
Pot Cap-1 Maneuver	328	97	0	0	98	314	-	-	-
Stage 1	-	-	0	0	155	-	-	-	-
Stage 2	307	154	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	75	97	-	-	98	314	-	-	-
Mov Cap-2 Maneuver	75	97	-	-	98	-	-	-	-
Stage 1	-	-	-	-	155	-	-	-	-
Stage 2	103	154	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	224.7	164.7	
HCM LOS	F	F	

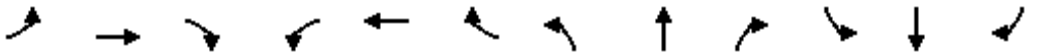
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	-	-	-	85	160
HCM Lane V/C Ratio	-	-	-	1.125	1.121
HCM Control Delay (s)	-	-	-	224.7	164.7
HCM Lane LOS	-	-	-	F	F
HCM 95th %tile Q(veh)	-	-	-	6.7	9.5



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	88	42	72	53	192	67	152	763	6	29	655	149
Future Volume (veh/h)	88	42	72	53	192	67	152	763	6	29	655	149
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1682	1682	1682	1723	1723	1723	1695	1695	1695	1695	1695	1695
Adj Flow Rate, veh/h	99	47	50	60	216	75	171	857	7	33	736	167
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	5	5	5	2	2	2	4	4	4	4	4	4
Cap, veh/h	239	474	402	442	345	120	388	1679	14	451	1216	276
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.16	1.00	1.00	0.03	0.47	0.47
Sat Flow, veh/h	1062	1682	1425	1298	1222	424	1615	3274	27	1615	2608	592
Grp Volume(v), veh/h	99	47	50	60	0	291	171	422	442	33	454	449
Grp Sat Flow(s),veh/h/ln	1062	1682	1425	1298	0	1646	1615	1611	1691	1615	1611	1589
Q Serve(g_s), s	6.3	1.4	1.8	2.5	0.0	10.8	3.6	0.0	0.0	0.7	14.7	14.7
Cycle Q Clear(g_c), s	17.1	1.4	1.8	3.9	0.0	10.8	3.6	0.0	0.0	0.7	14.7	14.7
Prop In Lane	1.00		1.00	1.00		0.26	1.00		0.02	1.00		0.37
Lane Grp Cap(c), veh/h	239	474	402	442	0	464	388	826	867	451	751	741
V/C Ratio(X)	0.41	0.10	0.12	0.14	0.00	0.63	0.44	0.51	0.51	0.07	0.60	0.61
Avail Cap(c_a), veh/h	311	589	499	531	0	576	443	826	867	697	751	741
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.72	0.72	0.72	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.4	18.6	18.7	20.0	0.0	21.9	8.9	0.0	0.0	8.9	13.9	13.9
Incr Delay (d2), s/veh	2.4	0.2	0.3	0.3	0.0	3.0	0.8	1.6	1.5	0.1	3.6	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	3.1	1.0	1.1	1.4	0.0	7.1	1.9	0.7	0.7	0.4	8.7	8.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.8	18.8	19.0	20.3	0.0	24.9	9.7	1.6	1.5	9.0	17.5	17.5
LnGrp LOS	C	B	B	C	A	C	A	A	A	A	B	B
Approach Vol, veh/h		196			351			1035			936	
Approach Delay, s/veh		25.4			24.1			2.9			17.2	
Approach LOS		C			C			A			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	37.2		24.2	5.4	40.4		24.2				
Change Period (Y+Rc), s	3.0	4.5		4.5	3.0	4.5		4.5				
Max Green Setting (Gmax), s	8.0	25.5		24.5	13.0	20.5		24.5				
Max Q Clear Time (g_c+I1), s	5.6	0.0		19.1	2.7	0.0		12.8				
Green Ext Time (p_c), s	0.2	0.0		0.7	0.0	0.0		2.8				

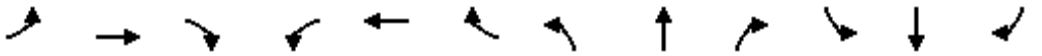
Intersection Summary			
HCM 6th Ctrl Delay		12.9	
HCM 6th LOS		B	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	267	121	118	17	51	34	48	853	14	68	909	74
Future Volume (veh/h)	267	121	118	17	51	34	48	853	14	68	909	74
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1750	1736	1736	1736	1723	1723	1723	1736	1736	1736
Adj Flow Rate, veh/h	287	130	79	18	55	37	52	917	15	73	977	80
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	1	1	1	2	2	2	1	1	1
Cap, veh/h	424	516	437	371	285	192	313	1665	27	479	1582	130
Arrive On Green	0.29	0.29	0.29	0.29	0.29	0.29	0.09	1.00	1.00	0.05	0.51	0.51
Sat Flow, veh/h	1325	1750	1483	1182	968	651	1641	3296	54	1654	3088	253
Grp Volume(v), veh/h	287	130	79	18	0	92	52	455	477	73	522	535
Grp Sat Flow(s),veh/h/ln	1325	1750	1483	1182	0	1619	1641	1637	1713	1654	1650	1691
Q Serve(g_s), s	16.5	4.5	3.2	0.9	0.0	3.4	1.2	0.0	0.0	1.6	18.1	18.1
Cycle Q Clear(g_c), s	19.9	4.5	3.2	5.5	0.0	3.4	1.2	0.0	0.0	1.6	18.1	18.1
Prop In Lane	1.00		1.00	1.00		0.40	1.00		0.03	1.00		0.15
Lane Grp Cap(c), veh/h	424	516	437	371	0	477	313	827	865	479	845	867
V/C Ratio(X)	0.68	0.25	0.18	0.05	0.00	0.19	0.17	0.55	0.55	0.15	0.62	0.62
Avail Cap(c_a), veh/h	473	580	491	415	0	536	407	827	865	664	845	867
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.80	0.80	0.80	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.6	21.5	21.0	23.6	0.0	21.1	10.1	0.0	0.0	8.3	13.9	13.9
Incr Delay (d2), s/veh	5.0	0.5	0.4	0.1	0.0	0.4	0.3	2.1	2.0	0.2	3.4	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	8.8	3.4	2.0	0.5	0.0	2.4	0.7	0.9	0.9	1.0	10.4	10.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.5	22.0	21.4	23.7	0.0	21.5	10.4	2.1	2.0	8.5	17.3	17.2
LnGrp LOS	C	C	C	C	A	C	B	A	A	A	B	B
Approach Vol, veh/h		496			110			984			1130	
Approach Delay, s/veh		28.6			21.9			2.5			16.7	
Approach LOS		C			C			A			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.4	45.5		28.1	7.0	44.9		28.1				
Change Period (Y+Rc), s	3.0	4.5		4.5	3.0	4.5		4.5				
Max Green Setting (Gmax), s	8.0	33.5		26.5	13.0	28.5		26.5				
Max Q Clear Time (g_c+I1), s	3.2	0.0		21.9	3.6	0.0		7.5				
Green Ext Time (p_c), s	0.1	0.0		1.6	0.2	0.0		0.9				

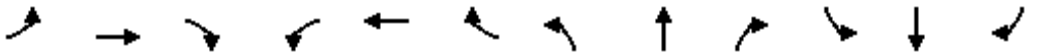
Intersection Summary												
HCM 6th Ctrl Delay			13.9									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	117	26	19	51	0	0	0	0	142	1082	68
Future Volume (veh/h)	0	117	26	19	51	0	0	0	0	142	1082	68
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
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1477	1477	1627	1627	0				1709	1709	1709
Adj Flow Rate, veh/h	0	126	17	20	55	0				153	1163	45
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93				0.93	0.93	0.93
Percent Heavy Veh, %	0	20	20	9	9	0				3	3	3
Cap, veh/h	0	198	168	221	218	0				1052	2099	936
Arrive On Green	0.00	0.13	0.13	0.13	0.13	0.00				0.65	0.65	0.65
Sat Flow, veh/h	0	1477	1252	1176	1627	0				1628	3247	1448
Grp Volume(v), veh/h	0	126	17	20	55	0				153	1163	45
Grp Sat Flow(s),veh/h/ln	0	1477	1252	1176	1627	0				1628	1624	1448
Q Serve(g_s), s	0.0	3.7	0.5	0.7	1.4	0.0				1.7	9.0	0.5
Cycle Q Clear(g_c), s	0.0	3.7	0.5	4.4	1.4	0.0				1.7	9.0	0.5
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	198	168	221	218	0				1052	2099	936
V/C Ratio(X)	0.00	0.64	0.10	0.09	0.25	0.00				0.15	0.55	0.05
Avail Cap(c_a), veh/h	0	811	687	709	893	0				1965	3921	1749
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	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	18.7	17.3	20.8	17.7	0.0				3.1	4.4	2.9
Incr Delay (d2), s/veh	0.0	1.3	0.1	0.1	0.2	0.0				0.1	0.2	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 BackOfQ(90%),veh/ln	0.0	2.2	0.3	0.3	0.9	0.0				0.6	3.1	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	19.9	17.4	20.8	17.9	0.0				3.2	4.7	3.0
LnGrp LOS	A	B	B	C	B	A				A	A	A
Approach Vol, veh/h		143			75						1361	
Approach Delay, s/veh		19.6			18.7						4.4	
Approach LOS		B			B						A	

Timer - Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		34.4		11.1				11.1				
Change Period (Y+Rc), s		5.0		5.0				5.0				
Max Green Setting (Gmax), s		55.0		25.0				25.0				
Max Q Clear Time (g_c+I1), s		11.0		5.7				6.4				
Green Ext Time (p_c), s		18.5		0.2				0.1				

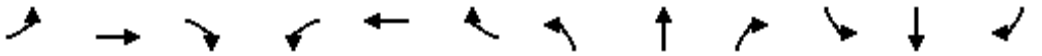
Intersection Summary												
HCM 6th Ctrl Delay			6.5									
HCM 6th LOS			A									



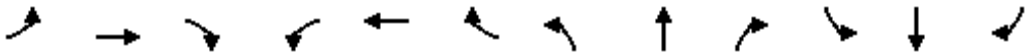
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	160	23	26	47	0	0	0	0	274	875	102
Future Volume (veh/h)	0	160	23	26	47	0	0	0	0	274	875	102
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1736	1736	1695	1695	0				1723	1723	1723
Adj Flow Rate, veh/h	0	172	15	28	51	0				295	941	68
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93				0.93	0.93	0.93
Percent Heavy Veh, %	0	1	1	4	4	0				2	2	2
Cap, veh/h	0	274	232	247	267	0				995	1985	885
Arrive On Green	0.00	0.16	0.16	0.16	0.16	0.00				0.61	0.61	0.61
Sat Flow, veh/h	0	1736	1471	1178	1695	0				1641	3273	1460
Grp Volume(v), veh/h	0	172	15	28	51	0				295	941	68
Grp Sat Flow(s),veh/h/ln	0	1736	1471	1178	1695	0				1641	1637	1460
Q Serve(g_s), s	0.0	3.9	0.4	1.0	1.1	0.0				3.7	6.7	0.8
Cycle Q Clear(g_c), s	0.0	3.9	0.4	4.9	1.1	0.0				3.7	6.7	0.8
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	274	232	247	267	0				995	1985	885
V/C Ratio(X)	0.00	0.63	0.06	0.11	0.19	0.00				0.30	0.47	0.08
Avail Cap(c_a), veh/h	0	1024	868	755	1000	0				2129	4247	1894
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	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	16.7	15.2	19.0	15.5	0.0				4.0	4.6	3.4
Incr Delay (d2), s/veh	0.0	0.9	0.0	0.1	0.1	0.0				0.2	0.2	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 BackOfQ(90%),veh/ln	0.0	2.6	0.2	0.4	0.7	0.0				1.4	2.4	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	17.6	15.2	19.1	15.6	0.0				4.2	4.8	3.5
LnGrp LOS	A	B	B	B	B	A				A	A	A
Approach Vol, veh/h		187			79						1304	
Approach Delay, s/veh		17.4			16.8						4.6	
Approach LOS		B			B						A	

Timer - Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		30.7		11.7				11.7				
Change Period (Y+Rc), s		5.0		5.0				5.0				
Max Green Setting (Gmax), s		55.0		25.0				25.0				
Max Q Clear Time (g_c+I1), s		8.7		5.9				6.9				
Green Ext Time (p_c), s		17.0		0.3				0.1				

Intersection Summary												
HCM 6th Ctrl Delay			6.7									
HCM 6th LOS			A									



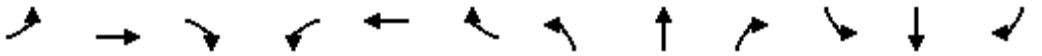
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	160	0	0	59	177	19	797	11	0	0	0
Future Volume (veh/h)	100	160	0	0	59	177	19	797	11	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1641	1641	0	0	1709	1709	1709	1709	1709			
Adj Flow Rate, veh/h	112	180	0	0	66	199	21	896	12			
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89			
Percent Heavy Veh, %	8	8	0	0	3	3	3	3	3			
Cap, veh/h	324	512	0	0	117	353	51	2300	32			
Arrive On Green	0.31	0.31	0.00	0.00	0.31	0.31	0.48	0.48	0.48			
Sat Flow, veh/h	1061	1641	0	0	375	1131	105	4785	66			
Grp Volume(v), veh/h	112	180	0	0	0	265	339	282	308			
Grp Sat Flow(s),veh/h/ln	1061	1641	0	0	0	1506	1704	1555	1697			
Q Serve(g_s), s	4.8	4.1	0.0	0.0	0.0	7.1	6.2	5.5	5.6			
Cycle Q Clear(g_c), s	11.8	4.1	0.0	0.0	0.0	7.1	6.2	5.5	5.6			
Prop In Lane	1.00		0.00	0.00		0.75	0.06		0.04			
Lane Grp Cap(c), veh/h	324	512	0	0	0	470	819	748	816			
V/C Ratio(X)	0.35	0.35	0.00	0.00	0.00	0.56	0.41	0.38	0.38			
Avail Cap(c_a), veh/h	543	850	0	0	0	780	1941	1772	1934			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	18.8	12.8	0.0	0.0	0.0	13.9	8.1	7.9	7.9			
Incr Delay (d2), s/veh	0.9	0.6	0.0	0.0	0.0	1.5	0.5	0.4	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 BackOfQ(90%),veh/ln	2.1	2.5	0.0	0.0	0.0	4.2	3.5	2.8	3.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.7	13.4	0.0	0.0	0.0	15.4	8.6	8.4	8.4			
LnGrp LOS	B	B	A	A	A	B	A	A	A			
Approach Vol, veh/h		292			265			929				
Approach Delay, s/veh		15.8			15.4			8.5				
Approach LOS		B			B			A				
Timer - Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				20.1		28.2		20.1				
Change Period (Y+Rc), s				5.0		5.0		5.0				
Max Green Setting (Gmax), s				25.0		55.0		25.0				
Max Q Clear Time (g_c+I1), s				13.8		8.2		9.1				
Green Ext Time (p_c), s				1.2		15.0		1.3				
Intersection Summary												
HCM 6th Ctrl Delay			11.1									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	292	0	0	65	163	21	1072	29	0	0	0
Future Volume (veh/h)	142	292	0	0	65	163	21	1072	29	0	0	0
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			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1736	1736	0	0	1736	1736	1736	1736	1736			
Adj Flow Rate, veh/h	169	348	0	0	77	194	25	1276	35			
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84			
Percent Heavy Veh, %	1	1	0	0	1	1	1	1	1			
Cap, veh/h	307	570	0	0	143	361	47	2548	72			
Arrive On Green	0.33	0.33	0.00	0.00	0.33	0.33	0.53	0.53	0.53			
Sat Flow, veh/h	1117	1736	0	0	437	1101	88	4799	136			
Grp Volume(v), veh/h	169	348	0	0	0	271	489	406	440			
Grp Sat Flow(s),veh/h/ln	1117	1736	0	0	0	1538	1732	1580	1712			
Q Serve(g_s), s	10.3	11.9	0.0	0.0	0.0	10.2	13.1	11.5	11.5			
Cycle Q Clear(g_c), s	20.5	11.9	0.0	0.0	0.0	10.2	13.1	11.5	11.5			
Prop In Lane	1.00		0.00	0.00		0.72	0.05		0.08			
Lane Grp Cap(c), veh/h	307	570	0	0	0	505	920	839	909			
V/C Ratio(X)	0.55	0.61	0.00	0.00	0.00	0.54	0.53	0.48	0.48			
Avail Cap(c_a), veh/h	335	612	0	0	0	542	1343	1225	1328			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	27.8	20.0	0.0	0.0	0.0	19.4	10.9	10.5	10.5			
Incr Delay (d2), s/veh	2.2	2.0	0.0	0.0	0.0	1.3	0.7	0.6	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 BackOfQ(90%),veh/ln	5.0	7.8	0.0	0.0	0.0	6.1	7.4	6.2	6.6			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.0	22.0	0.0	0.0	0.0	20.7	11.6	11.1	11.1			
LnGrp LOS	C	C	A	A	A	C	B	B	B			
Approach Vol, veh/h		517			271			1336				
Approach Delay, s/veh		24.6			20.7			11.3				
Approach LOS		C			C			B				

Timer - Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				28.3		42.7		28.3				
Change Period (Y+Rc), s				5.0		5.0		5.0				
Max Green Setting (Gmax), s				25.0		55.0		25.0				
Max Q Clear Time (g_c+I1), s				22.5		15.1		12.2				
Green Ext Time (p_c), s				0.8		22.5		1.2				

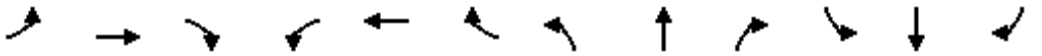
Intersection Summary												
HCM 6th Ctrl Delay			15.7									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	137	35	31	346	240	140	616	11	183	430	128
Future Volume (veh/h)	48	137	35	31	346	240	140	616	11	183	430	128
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1682	1682	1682	1723	1723	1723	1709	1709	1709	1695	1695	1695
Adj Flow Rate, veh/h	55	156	40	35	393	273	159	700	12	208	489	145
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	5	5	5	2	2	2	3	3	3	4	4	4
Cap, veh/h	180	424	109	81	529	480	412	1252	21	424	977	288
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.09	0.38	0.38	0.03	0.13	0.13
Sat Flow, veh/h	752	1291	331	78	1609	1460	1628	3267	56	1615	2453	723
Grp Volume(v), veh/h	55	0	196	428	0	273	159	348	364	208	320	314
Grp Sat Flow(s),veh/h/ln	752	0	1622	1687	0	1460	1628	1624	1699	1615	1611	1565
Q Serve(g_s), s	5.0	0.0	6.5	6.0	0.0	10.8	4.0	11.8	11.8	5.2	12.9	13.1
Cycle Q Clear(g_c), s	20.8	0.0	6.5	15.8	0.0	10.8	4.0	11.8	11.8	5.2	12.9	13.1
Prop In Lane	1.00		0.20	0.08		1.00	1.00		0.03	1.00		0.46
Lane Grp Cap(c), veh/h	180	0	533	610	0	480	412	622	651	424	642	624
V/C Ratio(X)	0.31	0.00	0.37	0.70	0.00	0.57	0.39	0.56	0.56	0.49	0.50	0.50
Avail Cap(c_a), veh/h	191	0	556	634	0	501	572	622	651	444	642	624
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.69	0.69	0.69
Uniform Delay (d), s/veh	30.4	0.0	17.9	21.0	0.0	19.4	12.2	16.9	16.9	12.9	23.9	24.0
Incr Delay (d2), s/veh	2.0	0.0	0.9	4.4	0.0	2.5	0.8	3.6	3.4	0.9	1.9	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	1.8	0.0	4.4	10.0	0.0	6.3	2.6	7.5	7.8	3.5	8.4	8.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.4	0.0	18.8	25.4	0.0	21.9	13.0	20.5	20.4	13.8	25.8	26.0
LnGrp LOS	C	A	B	C	A	C	B	C	C	B	C	C
Approach Vol, veh/h		251			701			871			842	
Approach Delay, s/veh		21.8			24.0			19.1			22.9	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.1	32.9		28.0	10.2	31.8		28.0				
Change Period (Y+Rc), s	3.0	5.0		5.0	3.0	5.0		5.0				
Max Green Setting (Gmax), s	13.0	20.0		24.0	8.0	25.0		24.0				
Max Q Clear Time (g_c+I1), s	6.0	0.0		22.8	7.2	0.0		17.8				
Green Ext Time (p_c), s	0.4	0.0		0.2	0.1	0.0		2.9				

Intersection Summary												
HCM 6th Ctrl Delay			21.9									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	131	361	78	27	184	158	70	604	37	353	629	73
Future Volume (veh/h)	131	361	78	27	184	158	70	604	37	353	629	73
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1736	1736	1723	1723	1723	1723	1723	1723	1736	1736	1736
Adj Flow Rate, veh/h	138	380	82	28	194	166	74	636	39	372	662	77
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	2	2	2	2	2	2	1	1	1
Cap, veh/h	142	450	97	64	341	474	359	1292	79	458	1376	160
Arrive On Green	0.32	0.32	0.32	0.32	0.32	0.32	0.05	0.41	0.41	0.03	0.15	0.15
Sat Flow, veh/h	1030	1384	299	42	1050	1460	1641	3133	192	1654	2978	346
Grp Volume(v), veh/h	138	0	462	222	0	166	74	332	343	372	366	373
Grp Sat Flow(s),veh/h/ln	1030	0	1683	1092	0	1460	1641	1637	1688	1654	1650	1674
Q Serve(g_s), s	4.1	0.0	20.4	1.5	0.0	6.9	2.0	12.0	12.0	8.0	16.3	16.3
Cycle Q Clear(g_c), s	26.0	0.0	20.4	21.9	0.0	6.9	2.0	12.0	12.0	8.0	16.3	16.3
Prop In Lane	1.00		0.18	0.13		1.00	1.00		0.11	1.00		0.21
Lane Grp Cap(c), veh/h	142	0	547	405	0	474	359	675	696	458	762	774
V/C Ratio(X)	0.97	0.00	0.84	0.55	0.00	0.35	0.21	0.49	0.49	0.81	0.48	0.48
Avail Cap(c_a), veh/h	142	0	547	405	0	474	543	675	696	458	762	774
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.74	0.74	0.74
Uniform Delay (d), s/veh	39.2	0.0	25.1	21.5	0.0	20.6	13.1	17.3	17.3	17.0	25.1	25.1
Incr Delay (d2), s/veh	66.6	0.0	12.6	2.7	0.0	0.9	0.4	2.6	2.5	8.5	1.6	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	8.3	0.0	13.8	5.8	0.0	4.4	1.4	7.6	7.8	5.6	10.5	10.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	105.8	0.0	37.8	24.2	0.0	21.5	13.5	19.9	19.8	25.5	26.7	26.7
LnGrp LOS	F	A	D	C	A	C	B	B	B	C	C	C
Approach Vol, veh/h		600			388			749			1111	
Approach Delay, s/veh		53.4			23.1			19.2			26.3	
Approach LOS		D			C			B			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.0	42.0		31.0	11.0	38.0		31.0				
Change Period (Y+Rc), s	3.0	5.0		5.0	3.0	5.0		5.0				
Max Green Setting (Gmax), s	13.0	28.0		26.0	8.0	33.0		26.0				
Max Q Clear Time (g_c+I1), s	4.0	0.0		28.0	10.0	0.0		23.9				
Green Ext Time (p_c), s	0.2	0.0		0.0	0.0	0.0		0.6				

Intersection Summary			
HCM 6th Ctrl Delay		29.7	
HCM 6th LOS		C	

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	59	1354	12	9	944
Future Vol, veh/h	15	59	1354	12	9	944
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	80	-	-	90	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	64	1472	13	10	1026

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2012	743	0	0	1485	0
Stage 1	1479	-	-	-	-	-
Stage 2	533	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	51	358	-	-	449	-
Stage 1	176	-	-	-	-	-
Stage 2	553	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	50	358	-	-	449	-
Mov Cap-2 Maneuver	137	-	-	-	-	-
Stage 1	176	-	-	-	-	-
Stage 2	541	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.8	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	137	358	449	-
HCM Lane V/C Ratio	-	-	0.119	0.179	0.022	-
HCM Control Delay (s)	-	-	34.8	17.2	13.2	-
HCM Lane LOS	-	-	D	C	B	-
HCM 95th %tile Q(veh)	-	-	0.4	0.6	0.1	-

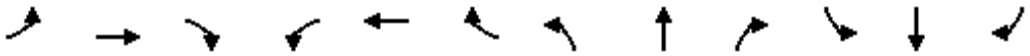
Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	38	1162	28	48	1012
Future Vol, veh/h	8	38	1162	28	48	1012
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	80	-	-	90	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	41	1263	30	52	1100

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1932	647	0	0	1293	0
Stage 1	1278	-	-	-	-	-
Stage 2	654	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	58	414	-	-	532	-
Stage 1	225	-	-	-	-	-
Stage 2	479	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	52	414	-	-	532	-
Mov Cap-2 Maneuver	156	-	-	-	-	-
Stage 1	225	-	-	-	-	-
Stage 2	432	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.3	0	0.6
HCM LOS	C		

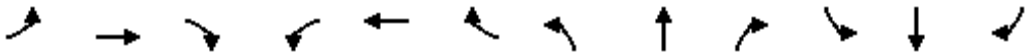
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	156	414	532	-
HCM Lane V/C Ratio	-	-	0.056	0.1	0.098	-
HCM Control Delay (s)	-	-	29.4	14.7	12.5	-
HCM Lane LOS	-	-	D	B	B	-
HCM 95th %tile Q(veh)	-	-	0.2	0.3	0.3	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	263	100	156	406	429	107	706	25	188	606	110
Future Volume (veh/h)	116	263	100	156	406	429	107	706	25	188	606	110
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1723	1723	1736	1736	1736	1695	1695	1695	1682	1682	1682
Adj Flow Rate, veh/h	145	299	70	177	461	488	122	802	28	214	689	125
Peak Hour Factor	0.80	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	1	1	1	4	4	4	5	5	5
Cap, veh/h	212	506	429	385	508	453	271	961	34	299	924	168
Arrive On Green	0.08	0.29	0.29	0.10	0.31	0.31	0.07	0.30	0.30	0.11	0.34	0.34
Sat Flow, veh/h	1641	1723	1460	1654	1650	1471	1615	3175	111	1602	2702	490
Grp Volume(v), veh/h	145	299	70	177	461	488	122	407	423	214	407	407
Grp Sat Flow(s),veh/h/ln	1641	1723	1460	1654	1650	1471	1615	1611	1675	1602	1598	1594
Q Serve(g_s), s	5.5	13.5	3.2	6.6	24.4	28.0	4.7	21.4	21.4	7.9	20.5	20.5
Cycle Q Clear(g_c), s	5.5	13.5	3.2	6.6	24.4	28.0	4.7	21.4	21.4	7.9	20.5	20.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		0.31
Lane Grp Cap(c), veh/h	212	506	429	385	508	453	271	487	507	299	547	545
V/C Ratio(X)	0.68	0.59	0.16	0.46	0.91	1.08	0.45	0.83	0.83	0.71	0.75	0.75
Avail Cap(c_a), veh/h	242	531	450	392	508	453	423	532	553	387	547	545
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.4	27.4	23.8	20.1	30.2	31.4	21.2	29.6	29.6	20.9	26.4	26.4
Incr Delay (d2), s/veh	4.7	1.6	0.2	0.3	20.0	64.4	0.4	10.3	10.0	2.6	5.5	5.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	4.2	8.8	2.0	4.6	16.8	24.3	3.2	13.5	13.9	5.3	12.2	12.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.1	29.0	24.0	20.4	50.2	95.8	21.7	39.9	39.6	23.6	31.9	32.0
LnGrp LOS	C	C	C	C	D	F	C	D	D	C	C	C
Approach Vol, veh/h		514			1126			952			1028	
Approach Delay, s/veh		28.1			65.3			37.4			30.2	
Approach LOS		C			E			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	33.5	11.6	32.7	9.5	37.1	10.3	34.0
Change Period (Y+Rc), s	3.0	6.0	3.0	6.0	3.0	6.0	3.0	6.0
Max Green Setting (Gmax), s	15.0	30.0	9.0	28.0	15.0	30.0	9.0	28.0
Max Q Clear Time (g_c+I1), s	9.9	23.4	8.6	15.5	6.7	22.5	7.5	30.0
Green Ext Time (p_c), s	0.2	4.1	0.0	1.0	0.1	4.5	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	42.7
HCM 6th LOS	D



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	148	472	167	64	185	301	121	866	55	229	539	151
Future Volume (veh/h)	148	472	167	64	185	301	121	866	55	229	539	151
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1736	1736	1709	1709	1709	1695	1695	1695	1709	1709	1709
Adj Flow Rate, veh/h	153	487	107	66	191	310	125	893	57	236	556	156
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	3	3	3	4	4	4	3	3	3
Cap, veh/h	287	521	442	195	441	393	334	1004	64	298	929	260
Arrive On Green	0.08	0.30	0.30	0.06	0.27	0.27	0.07	0.33	0.33	0.12	0.37	0.37
Sat Flow, veh/h	1654	1736	1471	1628	1624	1448	1615	3074	196	1628	2506	701
Grp Volume(v), veh/h	153	487	107	66	191	310	125	468	482	236	360	352
Grp Sat Flow(s),veh/h/ln	1654	1736	1471	1628	1624	1448	1615	1611	1660	1628	1624	1583
Q Serve(g_s), s	5.7	24.3	4.9	2.5	8.7	17.7	4.5	24.6	24.6	8.1	15.9	16.1
Cycle Q Clear(g_c), s	5.7	24.3	4.9	2.5	8.7	17.7	4.5	24.6	24.6	8.1	15.9	16.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.12	1.00		0.44
Lane Grp Cap(c), veh/h	287	521	442	195	441	393	334	526	542	298	602	587
V/C Ratio(X)	0.53	0.93	0.24	0.34	0.43	0.79	0.37	0.89	0.89	0.79	0.60	0.60
Avail Cap(c_a), veh/h	314	546	462	268	510	455	491	542	559	385	602	587
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.7	30.3	23.5	23.9	26.8	30.1	18.5	28.5	28.5	20.1	22.7	22.7
Incr Delay (d2), s/veh	0.6	23.0	0.3	0.4	0.7	7.8	0.3	16.3	15.9	6.2	1.6	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	4.0	17.9	3.1	1.8	5.8	10.3	3.0	16.0	16.3	5.8	9.4	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.3	53.3	23.8	24.3	27.5	37.9	18.8	44.8	44.4	26.3	24.3	24.4
LnGrp LOS	C	D	C	C	C	D	B	D	D	C	C	C
Approach Vol, veh/h		747			567			1075			948	
Approach Delay, s/veh		42.7			32.8			41.6			24.8	
Approach LOS		D			C			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.3	35.1	8.0	32.7	9.3	39.0	10.5	30.2
Change Period (Y+Rc), s	3.0	6.0	3.0	6.0	3.0	6.0	3.0	6.0
Max Green Setting (Gmax), s	15.0	30.0	9.0	28.0	15.0	30.0	9.0	28.0
Max Q Clear Time (g_c+I1), s	10.1	26.6	4.5	26.3	6.5	18.1	7.7	19.7
Green Ext Time (p_c), s	0.2	2.5	0.0	0.4	0.1	5.7	0.0	1.3

Intersection Summary	
HCM 6th Ctrl Delay	35.6
HCM 6th LOS	D

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	138	434	511	118	645	77	138	75	51	44	105	27
Future Volume (veh/h)	138	434	511	118	645	77	138	75	51	44	105	27
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1709	1743	1709	1709	1743	1709	1695	1710	1695	1709	1724	1709
Adj Flow Rate, veh/h	147	462	337	126	686	51	147	80	54	47	112	29
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	4	4	4	3	3	3
Cap, veh/h	454	1568	686	472	1554	679	383	331	206	373	353	88
Arrive On Green	0.07	0.47	0.47	0.07	0.47	0.47	0.10	0.17	0.17	0.07	0.14	0.14
Sat Flow, veh/h	1628	3312	1448	1628	3312	1448	1615	1923	1196	1628	2594	651
Grp Volume(v), veh/h	147	462	337	126	686	51	147	66	68	47	69	72
Grp Sat Flow(s),veh/h/ln	1628	1656	1448	1628	1656	1448	1615	1624	1495	1628	1638	1607
Q Serve(g_s), s	3.3	6.3	11.7	2.8	10.2	1.4	5.4	2.6	2.9	1.7	2.8	3.0
Cycle Q Clear(g_c), s	3.3	6.3	11.7	2.8	10.2	1.4	5.4	2.6	2.9	1.7	2.8	3.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.80	1.00		0.40
Lane Grp Cap(c), veh/h	454	1568	686	472	1554	679	383	280	258	373	223	219
V/C Ratio(X)	0.32	0.29	0.49	0.27	0.44	0.08	0.38	0.24	0.26	0.13	0.31	0.33
Avail Cap(c_a), veh/h	778	2707	1184	803	2707	1184	655	885	814	707	892	875
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.3	11.8	13.3	8.8	13.1	10.7	22.1	26.2	26.3	24.0	28.6	28.7
Incr Delay (d2), s/veh	0.4	0.5	2.5	0.6	0.9	0.2	0.2	0.6	0.8	0.1	1.1	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	2.0	4.0	6.4	1.7	6.1	0.8	3.6	1.8	1.9	1.2	2.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.7	12.3	15.8	9.4	14.0	10.9	22.4	26.8	27.1	24.1	29.7	29.9
LnGrp LOS	A	B	B	A	B	B	C	C	C	C	C	C
Approach Vol, veh/h		946			863			281			188	
Approach Delay, s/veh		13.1			13.1			24.6			28.4	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.1	39.8	10.6	15.0	8.4	39.4	7.9	17.7
Change Period (Y+Rc), s	3.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0
Max Green Setting (Gmax), s	20.0	60.0	20.0	40.0	20.0	60.0	20.0	40.0
Max Q Clear Time (g_c+I1), s	4.8	8.3	7.4	5.0	5.3	12.2	3.7	4.9
Green Ext Time (p_c), s	0.6	9.0	0.0	1.8	0.3	22.3	0.0	1.7

Intersection Summary	
HCM 6th Ctrl Delay	15.8
HCM 6th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

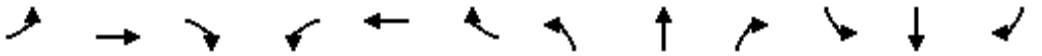
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	41	745	100	67	651	70	369	175	160	90	70	88
Future Volume (veh/h)	41	745	100	67	651	70	369	175	160	90	70	88
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1771	1736	1736	1771	1736	1736	1751	1736	1709	1724	1709
Adj Flow Rate, veh/h	46	828	69	74	723	48	410	194	178	100	78	98
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	3	3	3
Cap, veh/h	367	1556	681	331	1584	693	483	411	356	315	180	161
Arrive On Green	0.04	0.46	0.46	0.05	0.47	0.47	0.21	0.24	0.24	0.08	0.11	0.11
Sat Flow, veh/h	1654	3365	1471	1654	3365	1471	1654	1689	1462	1628	1638	1461
Grp Volume(v), veh/h	46	828	69	74	723	48	410	191	181	100	78	98
Grp Sat Flow(s),veh/h/ln	1654	1683	1471	1654	1683	1471	1654	1664	1488	1628	1638	1461
Q Serve(g_s), s	1.3	16.5	2.5	2.2	13.6	1.7	20.0	9.2	9.9	5.0	4.2	6.0
Cycle Q Clear(g_c), s	1.3	16.5	2.5	2.2	13.6	1.7	20.0	9.2	9.9	5.0	4.2	6.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Lane Grp Cap(c), veh/h	367	1556	681	331	1584	693	483	405	362	315	180	161
V/C Ratio(X)	0.13	0.53	0.10	0.22	0.46	0.07	0.85	0.47	0.50	0.32	0.43	0.61
Avail Cap(c_a), veh/h	657	2142	937	607	2142	937	483	706	632	532	695	620
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.1	18.1	14.3	13.6	16.8	13.6	27.7	30.5	30.7	33.0	39.2	40.0
Incr Delay (d2), s/veh	0.2	1.3	0.3	0.7	1.0	0.2	12.6	1.2	1.5	0.2	2.3	5.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	0.9	9.7	1.6	1.5	8.2	1.0	13.4	6.3	6.1	3.5	3.2	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.2	19.4	14.6	14.3	17.8	13.8	40.3	31.7	32.2	33.3	41.5	45.2
LnGrp LOS	B	B	B	B	B	B	D	C	C	C	D	D
Approach Vol, veh/h		943			845			782			276	
Approach Delay, s/veh		18.7			17.2			36.3			39.8	
Approach LOS		B			B			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.3	48.6	23.0	15.4	6.5	49.4	10.4	28.0
Change Period (Y+Rc), s	3.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0
Max Green Setting (Gmax), s	20.0	60.0	20.0	40.0	20.0	60.0	20.0	40.0
Max Q Clear Time (g_c+I1), s	4.2	18.5	22.0	8.0	3.3	15.6	7.0	11.9
Green Ext Time (p_c), s	0.3	25.1	0.0	2.3	0.1	22.8	0.0	5.2

Intersection Summary	
HCM 6th Ctrl Delay	25.2
HCM 6th LOS	C

Notes

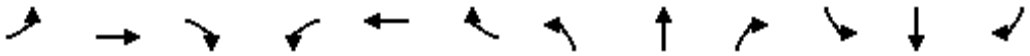
User approved pedestrian interval to be less than phase max green.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	126	132	78	80	144	82	100	679	90	87	513	169
Future Volume (veh/h)	126	132	78	80	144	82	100	679	90	87	513	169
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1695	1628	1695	1654	1654	1723	1695	1695	1695	1682	1682	1682
Adj Flow Rate, veh/h	142	148	88	90	162	92	112	763	101	98	576	190
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	4	4	4	2	2	2	4	4	4	5	5	5
Cap, veh/h	318	224	133	317	204	116	349	1095	145	318	897	295
Arrive On Green	0.09	0.23	0.23	0.06	0.21	0.21	0.07	0.38	0.38	0.07	0.38	0.38
Sat Flow, veh/h	1615	956	569	1575	990	562	1615	2860	378	1602	2362	777
Grp Volume(v), veh/h	142	0	236	90	0	254	112	430	434	98	389	377
Grp Sat Flow(s),veh/h/ln	1615	0	1525	1575	0	1553	1615	1611	1627	1602	1598	1542
Q Serve(g_s), s	4.2	0.0	8.8	2.8	0.0	9.8	2.6	14.1	14.1	2.3	12.5	12.6
Cycle Q Clear(g_c), s	4.2	0.0	8.8	2.8	0.0	9.8	2.6	14.1	14.1	2.3	12.5	12.6
Prop In Lane	1.00		0.37	1.00		0.36	1.00		0.23	1.00		0.50
Lane Grp Cap(c), veh/h	318	0	357	317	0	319	349	617	623	318	607	585
V/C Ratio(X)	0.45	0.00	0.66	0.28	0.00	0.80	0.32	0.70	0.70	0.31	0.64	0.64
Avail Cap(c_a), veh/h	684	0	1336	719	0	1360	752	1539	1555	723	1526	1473
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.4	0.0	21.8	18.2	0.0	23.7	11.8	16.3	16.3	12.1	16.0	16.0
Incr Delay (d2), s/veh	0.4	0.0	2.1	0.2	0.0	4.5	0.2	1.1	1.1	0.2	0.8	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	2.7	0.0	5.5	1.8	0.0	6.3	1.5	7.8	7.8	1.3	7.0	6.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.8	0.0	23.9	18.4	0.0	28.2	12.0	17.4	17.4	12.3	16.8	16.9
LnGrp LOS	B	A	C	B	A	C	B	B	B	B	B	B
Approach Vol, veh/h		378			344			976			864	
Approach Delay, s/veh		21.6			25.7			16.8			16.3	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.3	28.8	7.0	19.7	7.1	29.0	8.8	17.9
Change Period (Y+Rc), s	3.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0
Max Green Setting (Gmax), s	20.0	60.0	20.0	55.0	20.0	60.0	20.0	55.0
Max Q Clear Time (g_c+I1), s	4.6	14.6	4.8	10.8	4.3	16.1	6.2	11.8
Green Ext Time (p_c), s	0.1	6.9	0.1	1.1	0.1	7.9	0.1	1.1

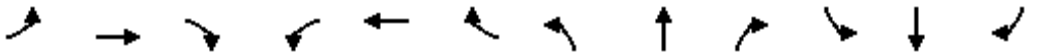
Intersection Summary	
HCM 6th Ctrl Delay	18.5
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	206	175	110	146	100	116	66	697	118	59	609	42
Future Volume (veh/h)	206	175	110	146	100	116	66	697	118	59	609	42
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1667	1736	1667	1667	1736	1695	1695	1695	1709	1709	1709
Adj Flow Rate, veh/h	215	182	115	152	104	121	69	726	123	61	634	44
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	4	4	4	3	3	3
Cap, veh/h	397	221	140	321	142	165	353	1029	174	289	1140	79
Arrive On Green	0.13	0.23	0.23	0.10	0.20	0.20	0.05	0.37	0.37	0.05	0.37	0.37
Sat Flow, veh/h	1654	955	603	1588	702	817	1615	2755	467	1628	3081	214
Grp Volume(v), veh/h	215	0	297	152	0	225	69	424	425	61	334	344
Grp Sat Flow(s),veh/h/ln	1654	0	1558	1588	0	1520	1615	1611	1611	1628	1624	1671
Q Serve(g_s), s	6.4	0.0	11.8	4.8	0.0	9.1	1.7	14.7	14.7	1.5	10.7	10.7
Cycle Q Clear(g_c), s	6.4	0.0	11.8	4.8	0.0	9.1	1.7	14.7	14.7	1.5	10.7	10.7
Prop In Lane	1.00		0.39	1.00		0.54	1.00		0.29	1.00		0.13
Lane Grp Cap(c), veh/h	397	0	361	321	0	308	353	601	602	289	601	618
V/C Ratio(X)	0.54	0.00	0.82	0.47	0.00	0.73	0.20	0.71	0.71	0.21	0.56	0.56
Avail Cap(c_a), veh/h	690	0	1309	648	0	1277	758	1476	1477	703	1488	1531
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.1	0.0	23.9	18.5	0.0	24.4	12.3	17.4	17.4	13.2	16.4	16.4
Incr Delay (d2), s/veh	0.4	0.0	4.7	0.4	0.0	3.3	0.1	1.1	1.1	0.1	0.6	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	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	4.2	0.0	7.4	3.1	0.0	5.8	1.0	8.1	8.2	0.9	6.3	6.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.5	0.0	28.6	18.9	0.0	27.8	12.4	18.6	18.6	13.3	17.0	16.9
LnGrp LOS	B	A	C	B	A	C	B	B	B	B	B	B
Approach Vol, veh/h		512			377			918			739	
Approach Delay, s/veh		24.0			24.2			18.1			16.6	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.6	29.2	9.5	20.1	6.4	29.4	11.4	18.3
Change Period (Y+Rc), s	3.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0
Max Green Setting (Gmax), s	20.0	60.0	20.0	55.0	20.0	60.0	20.0	55.0
Max Q Clear Time (g_c+I1), s	3.7	12.7	6.8	13.8	3.5	16.7	8.4	11.1
Green Ext Time (p_c), s	0.0	5.7	0.1	1.4	0.0	7.8	0.2	1.0

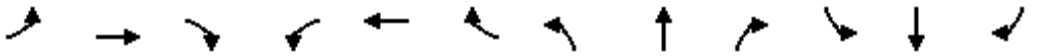
Intersection Summary	
HCM 6th Ctrl Delay	19.8
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	88	19	27	309	102	37	496	14	109	291	90
Future Volume (veh/h)	25	88	19	27	309	102	37	496	14	109	291	90
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1600	1664	1600	1695	1763	1695	1695	1695	1695	1682	1682	1682
Adj Flow Rate, veh/h	27	96	21	29	336	111	40	539	15	118	316	98
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
Percent Heavy Veh, %	11	11	11	4	4	4	4	4	4	5	5	5
Cap, veh/h	158	411	90	425	394	130	531	1406	39	477	1121	342
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.04	0.44	0.44	0.06	0.46	0.46
Sat Flow, veh/h	876	1322	289	1255	1269	419	1615	3201	89	1602	2412	735
Grp Volume(v), veh/h	27	0	117	29	0	447	40	271	283	118	207	207
Grp Sat Flow(s),veh/h/ln	876	0	1612	1255	0	1688	1615	1611	1679	1602	1598	1549
Q Serve(g_s), s	2.1	0.0	3.8	1.2	0.0	17.4	0.9	7.9	8.0	2.7	5.6	5.8
Cycle Q Clear(g_c), s	19.5	0.0	3.8	5.0	0.0	17.4	0.9	7.9	8.0	2.7	5.6	5.8
Prop In Lane	1.00		0.18	1.00		0.25	1.00		0.05	1.00		0.47
Lane Grp Cap(c), veh/h	158	0	501	425	0	524	531	708	738	477	743	720
V/C Ratio(X)	0.17	0.00	0.23	0.07	0.00	0.85	0.08	0.38	0.38	0.25	0.28	0.29
Avail Cap(c_a), veh/h	186	0	553	465	0	579	700	708	738	603	743	720
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.7	0.0	17.9	19.8	0.0	22.6	9.9	13.2	13.2	9.5	11.5	11.6
Incr Delay (d2), s/veh	1.1	0.0	0.5	0.1	0.0	12.6	0.1	1.6	1.5	0.4	0.9	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	0.9	0.0	2.6	0.7	0.0	12.1	0.6	5.2	5.4	1.6	3.7	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.8	0.0	18.4	19.9	0.0	35.2	10.0	14.8	14.7	9.9	12.5	12.6
LnGrp LOS	C	A	B	B	A	D	A	B	B	A	B	B
Approach Vol, veh/h		144			476			594			532	
Approach Delay, s/veh		21.1			34.3			14.4			11.9	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.7	37.5		26.8	7.5	35.8		26.8				
Change Period (Y+Rc), s	3.0	5.0		5.0	3.0	5.0		5.0				
Max Green Setting (Gmax), s	10.0	23.0		24.0	10.0	23.0		24.0				
Max Q Clear Time (g_c+I1), s	2.9	0.0		21.5	4.7	0.0		19.4				
Green Ext Time (p_c), s	0.0	0.0		0.3	0.2	0.0		2.0				

Intersection Summary			
HCM 6th Ctrl Delay		19.6	
HCM 6th LOS		B	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	119	294	20	17	85	87	22	397	20	121	506	23
Future Volume (veh/h)	119	294	20	17	85	87	22	397	20	121	506	23
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1806	1736	1709	1777	1709	1709	1709	1709	1736	1736	1736
Adj Flow Rate, veh/h	134	330	22	19	96	98	25	446	22	136	569	26
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	1	1	1	3	3	3	3	3	3	1	1	1
Cap, veh/h	291	447	30	179	215	220	497	1604	79	590	1747	80
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.03	0.51	0.51	0.06	0.54	0.54
Sat Flow, veh/h	1198	1674	112	1021	806	823	1628	3150	155	1654	3213	147
Grp Volume(v), veh/h	134	0	352	19	0	194	25	229	239	136	292	303
Grp Sat Flow(s),veh/h/ln	1198	0	1786	1021	0	1629	1628	1624	1681	1654	1650	1710
Q Serve(g_s), s	8.4	0.0	14.4	1.4	0.0	7.9	0.6	6.5	6.5	2.9	7.8	7.9
Cycle Q Clear(g_c), s	16.3	0.0	14.4	15.8	0.0	7.9	0.6	6.5	6.5	2.9	7.8	7.9
Prop In Lane	1.00		0.06	1.00		0.51	1.00		0.09	1.00		0.09
Lane Grp Cap(c), veh/h	291	0	477	179	0	435	497	827	856	590	897	930
V/C Ratio(X)	0.46	0.00	0.74	0.11	0.00	0.45	0.05	0.28	0.28	0.23	0.33	0.33
Avail Cap(c_a), veh/h	361	0	580	238	0	530	657	827	856	696	897	930
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.2	0.0	26.8	34.0	0.0	24.4	8.9	11.2	11.2	7.7	10.1	10.1
Incr Delay (d2), s/veh	2.4	0.0	5.9	0.6	0.0	1.5	0.1	0.8	0.8	0.3	1.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	4.6	0.0	10.1	0.7	0.0	5.5	0.4	4.3	4.5	1.8	5.1	5.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.6	0.0	32.6	34.5	0.0	25.9	9.0	12.1	12.0	8.0	11.1	11.1
LnGrp LOS	C	A	C	C	A	C	A	B	B	A	B	B
Approach Vol, veh/h		486			213			493			731	
Approach Delay, s/veh		32.9			26.7			11.9			10.5	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.1	48.5		26.4	7.9	45.7		26.4				
Change Period (Y+Rc), s	3.0	5.0		5.0	3.0	5.0		5.0				
Max Green Setting (Gmax), s	10.0	31.0		26.0	10.0	31.0		26.0				
Max Q Clear Time (g_c+I1), s	2.6	0.0		18.3	4.9	0.0		17.8				
Green Ext Time (p_c), s	0.0	0.0		3.1	0.2	0.0		1.3				

Intersection Summary			
HCM 6th Ctrl Delay		18.3	
HCM 6th LOS		B	

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	93	403	39	129	712	26	11	54	49	21	229	126
Future Volume (veh/h)	93	403	39	129	712	26	11	54	49	21	229	126
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1654	1669	1654	1695	1710	1695	1600	1600	1664	1695	1695	1695
Adj Flow Rate, veh/h	104	453	44	145	800	29	12	61	0	24	257	88
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	7	7	7	4	4	4	11	11	11	4	4	4
Cap, veh/h	376	1210	117	527	1389	50	225	345		403	387	328
Arrive On Green	0.07	0.41	0.41	0.09	0.43	0.43	0.02	0.22	0.00	0.03	0.23	0.23
Sat Flow, veh/h	1576	2920	283	1615	3198	116	1524	1600	1410	1615	1695	1437
Grp Volume(v), veh/h	104	245	252	145	406	423	12	61	0	24	257	88
Grp Sat Flow(s),veh/h/ln	1576	1585	1618	1615	1624	1689	1524	1600	1410	1615	1695	1437
Q Serve(g_s), s	2.3	6.7	6.8	3.1	11.8	11.8	0.4	1.9	0.0	0.7	8.6	3.2
Cycle Q Clear(g_c), s	2.3	6.7	6.8	3.1	11.8	11.8	0.4	1.9	0.0	0.7	8.6	3.2
Prop In Lane	1.00		0.17	1.00		0.07	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	376	657	670	527	706	734	225	345		403	387	328
V/C Ratio(X)	0.28	0.37	0.38	0.28	0.58	0.58	0.05	0.18		0.06	0.66	0.27
Avail Cap(c_a), veh/h	775	1520	1551	902	1558	1620	689	1023		875	1084	918
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.1	12.7	12.7	8.9	13.3	13.3	19.2	20.0	0.0	18.2	22.0	19.9
Incr Delay (d2), s/veh	0.4	0.4	0.3	0.3	0.7	0.7	0.1	0.3	0.0	0.1	2.8	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	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	1.3	3.9	4.0	1.7	6.4	6.6	0.2	1.3	0.0	0.5	6.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.5	13.1	13.1	9.2	14.1	14.1	19.3	20.3	0.0	18.3	24.8	20.5
LnGrp LOS	B	B	B	A	B	B	B	C		B	C	C
Approach Vol, veh/h		601			974			73	A		369	
Approach Delay, s/veh		12.6			13.3			20.2			23.3	
Approach LOS		B			B			C			C	

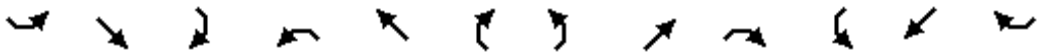
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.2	32.2	4.7	18.5	8.4	30.9	3.9	19.3
Change Period (Y+Rc), s	3.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0
Max Green Setting (Gmax), s	20.0	60.0	20.0	40.0	20.0	60.0	20.0	40.0
Max Q Clear Time (g_c+I1), s	4.3	13.8	2.7	3.9	5.1	8.8	2.4	10.6
Green Ext Time (p_c), s	0.6	13.4	0.0	0.6	0.9	7.1	0.0	3.6

Intersection Summary	
HCM 6th Ctrl Delay	15.2
HCM 6th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NER] is excluded from calculations of the approach delay and intersection delay.



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	160	829	8	44	636	31	106	215	113	34	45	118
Future Volume (veh/h)	160	829	8	44	636	31	106	215	113	34	45	118
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1737	1723	1723	1737	1723	1723	1723	1792	1709	1709	1709
Adj Flow Rate, veh/h	174	901	9	48	691	34	115	234	0	37	49	80
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	3	3	3
Cap, veh/h	457	1559	16	352	1321	65	412	345		260	272	231
Arrive On Green	0.10	0.47	0.47	0.04	0.41	0.41	0.08	0.20	0.00	0.04	0.16	0.16
Sat Flow, veh/h	1641	3349	33	1641	3202	157	1641	1723	1518	1628	1709	1448
Grp Volume(v), veh/h	174	444	466	48	356	369	115	234	0	37	49	80
Grp Sat Flow(s),veh/h/ln	1641	1651	1731	1641	1651	1709	1641	1723	1518	1628	1709	1448
Q Serve(g_s), s	3.5	12.5	12.5	1.0	10.3	10.3	3.5	8.0	0.0	1.2	1.6	3.1
Cycle Q Clear(g_c), s	3.5	12.5	12.5	1.0	10.3	10.3	3.5	8.0	0.0	1.2	1.6	3.1
Prop In Lane	1.00		0.02	1.00		0.09	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	457	768	806	352	681	705	412	345		260	272	231
V/C Ratio(X)	0.38	0.58	0.58	0.14	0.52	0.52	0.28	0.68		0.14	0.18	0.35
Avail Cap(c_a), veh/h	811	1556	1632	793	1556	1611	798	1083		710	1074	910
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.0	12.4	12.4	10.4	14.0	14.0	18.6	23.5	0.0	21.2	23.2	23.8
Incr Delay (d2), s/veh	0.5	0.7	0.7	0.2	0.6	0.6	0.4	3.3	0.0	0.2	0.4	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	1.9	6.8	7.0	0.6	5.9	6.1	2.4	5.8	0.0	0.8	1.2	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.6	13.1	13.1	10.5	14.6	14.6	19.0	26.8	0.0	21.5	23.6	25.1
LnGrp LOS	A	B	B	B	B	B	B	C		C	C	C
Approach Vol, veh/h		1084			773			349	A		166	
Approach Delay, s/veh		12.5			14.4			24.3			23.8	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.2	31.2	5.4	17.8	5.9	34.6	8.0	15.1
Change Period (Y+Rc), s	3.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0
Max Green Setting (Gmax), s	20.0	60.0	20.0	40.0	20.0	60.0	20.0	40.0
Max Q Clear Time (g_c+I1), s	5.5	12.3	3.2	10.0	3.0	14.5	5.5	5.1
Green Ext Time (p_c), s	1.1	11.2	0.1	2.8	0.2	15.1	0.3	1.0

Intersection Summary	
HCM 6th Ctrl Delay	15.7
HCM 6th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NER] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	4	40	0	2	51	21	766	2	12	550	64
Future Vol, veh/h	12	4	40	0	2	51	21	766	2	12	550	64
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	70	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	4	43	0	2	55	23	833	2	13	598	70

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1123	1540	334	1207	1574	418	668	0	0	835	0	0
Stage 1	659	659	-	880	880	-	-	-	-	-	-	-
Stage 2	464	881	-	327	694	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	160	114	662	139	109	584	918	-	-	794	-	-
Stage 1	419	459	-	308	363	-	-	-	-	-	-	-
Stage 2	548	363	-	660	442	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	139	109	662	124	105	584	918	-	-	794	-	-
Mov Cap-2 Maneuver	262	226	-	229	221	-	-	-	-	-	-	-
Stage 1	409	452	-	300	354	-	-	-	-	-	-	-
Stage 2	481	354	-	601	435	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.2	12.3	0.2	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	918	-	-	452	550	794	-	-
HCM Lane V/C Ratio	0.025	-	-	0.135	0.105	0.016	-	-
HCM Control Delay (s)	9	-	-	14.2	12.3	9.6	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	0.3	0.1	-	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	45	2	41	2	0	28	20	775	11	27	801	34
Future Vol, veh/h	45	2	41	2	0	28	20	775	11	27	801	34
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	70	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	49	2	45	2	0	30	22	842	12	29	871	37

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1413	1846	454	1387	1858	427	908	0	0	854	0	0
Stage 1	948	948	-	892	892	-	-	-	-	-	-	-
Stage 2	465	898	-	495	966	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	98	74	553	102	73	576	745	-	-	781	-	-
Stage 1	280	338	-	303	358	-	-	-	-	-	-	-
Stage 2	547	356	-	525	331	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	88	69	553	88	68	576	745	-	-	781	-	-
Mov Cap-2 Maneuver	194	178	-	199	177	-	-	-	-	-	-	-
Stage 1	272	325	-	294	347	-	-	-	-	-	-	-
Stage 2	503	345	-	462	319	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	24.7	12.5	0.2	0.3
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	745	-	-	277	511	781	-	-
HCM Lane V/C Ratio	0.029	-	-	0.345	0.064	0.038	-	-
HCM Control Delay (s)	10	-	-	24.7	12.5	9.8	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.5	0.2	0.1	-	-

HCS 2010 Roundabout Report

General Information

Analyst	AECOM
Agency or Co.	WisDOT
Date Performed	1/5/2021
Analysis Year	2020
Time Period	AM Peak
Project Description	1630-08-00 La Crosse Safety & Ops Study

Site Information

Intersection	61. USH 14/61 (South Ave) & STH 35 (West Ave) / Weston St
E/W Street Name	USH 14/61 (South Ave)
N/S Street Name	STH 35 (West Ave) / Weston St
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.86
Jurisdiction	WisDOT

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	2	0	0	0	2	0	0	0	1	0	0	1	1	0
Lane Assignment	LT		TR		LT		TR				LTR		L		LTR	
Volume (V), veh/h	0	0	418	1	0	23	824	415	0	0	0	1	0	250	3	21
Percent Heavy Vehicles, %	8	8	8	8	3	3	3	3	0	0	0	0	1	1	1	1
Flow Rate (vPCE) pc/h	0	0	525	1	0	28	987	497	0	0	0	1	0	294	4	25
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	2				1				2				2			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)	4.6000	4.3000		4.7000	4.4000			4.8000		4.6000	4.3000	
Follow-Up Headway (sec)	2.6000	2.6000		2.5000	2.5000			2.6000		2.6000	2.6000	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h	247	279		711	801			1		171	152	
Entry Volume veh/h	229	258		690	778			1		169	150	
Circulating Flow (Vc), pc/h	326			0			819			1015		
Exiting Flow (Vex), pc/h	820			1012			497			33		
Capacity (cPCE), pc/h	1027	1055		1440	1440			624		546	594	
Capacity (c), veh/h	951	977		1398	1398			624		541	588	
v/c Ratio (X)	0.24	0.26		0.49	0.56			0.00		0.31	0.26	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh	6.2	6.3		7.5	8.5			5.8		11.2	9.5	
Lane LOS	A	A		A	A			A		B	A	
95% Queue	0.9	1.1		2.8	3.6			0.0		1.3	1.0	
Approach Delay, s/veh	6.3			8.1			5.8			10.4		
Approach LOS	A			A			A			B		
Intersection Delay, s/veh / LOS	8.0						A					

HCS 2010 Roundabout Report

General Information

Analyst	AECOM
Agency or Co.	WisDOT
Date Performed	1/5/2021
Analysis Year	2020
Time Period	PM Peak
Project Description	1630-08-00 La Crosse Safety & Ops Study

Site Information

Intersection	61. USH 14/61 (South Ave) & STH 35 (West Ave) / Weston St
E/W Street Name	USH 14/61 (South Ave)
N/S Street Name	STH 35 (West Ave) / Weston St
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.94
Jurisdiction	WisDOT

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	2	0	0	0	2	0	0	0	1	0	0	1	1	0
Lane Assignment	LT		TR		LT		TR				LTR		L		LTR	
Volume (V), veh/h	0	0	957	0	0	7	626	358	0	0	0	0	0	511	2	14
Percent Heavy Vehicles, %	0	0	0	0	2	2	2	2	0	0	0	0	0	0	0	0
Flow Rate (vPCE) pc/h	0	0	1018	0	0	8	679	388	0	0	0	0	0	544	2	15
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	2				1				2				2			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)	4.6000	4.3000		4.7000	4.4000			4.8000		4.6000	4.3000	
Follow-Up Headway (sec)	2.6000	2.6000		2.5000	2.5000			2.6000		2.6000	2.6000	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h	478	540		505	570			0		297	264	
Entry Volume veh/h	478	540		495	559			0		297	264	
Circulating Flow (Vc), pc/h	554			0			1562			687		
Exiting Flow (Vex), pc/h	1562			694			388			10		
Capacity (cPCE), pc/h	833	873		1440	1440			303		738	781	
Capacity (c), veh/h	833	873		1412	1412			303		738	781	
v/c Ratio (X)	0.57	0.62		0.35	0.40			0.00		0.40	0.34	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh	12.9	13.7		5.7	6.2			11.9		10.2	8.6	
Lane LOS	B	B		A	A			B		B	A	
95% Queue	3.7	4.4		1.6	1.9			0.0		2.0	1.5	
Approach Delay, s/veh	13.3			5.9						9.4		
Approach LOS	B			A						A		
Intersection Delay, s/veh / LOS	9.5						A					

HCS 2010 Roundabout Report

General Information

Analyst	AECOM
Agency or Co.	WisDOT
Date Performed	1/5/2021
Analysis Year	2020
Time Period	AM Peak
Project Description	1630-08-00 La Crosse Safety & Ops Study

Site Information

Intersection	62. USH 14/61 (South Ave) & 16th St / Castle Pl
E/W Street Name	USH 14/61 (South Ave)
N/S Street Name	16th St / Castle Pl
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	WisDOT

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	2	0	0	0	2	0	0	0	1	0	0	0	1	0
Lane Assignment	LT		TR		LT		TR				LTR				LTR	
Volume (V), veh/h	0	13	670	10	0	2	1328	68	0	6	2	3	0	29	0	6
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	14	743	11	0	2	1472	75	0	7	2	3	0	32	0	7
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				2				2			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)	4.7000	4.4000		4.7000	4.4000			4.8000			4.8000	
Follow-Up Headway (sec)	2.5000	2.5000		2.5000	2.5000			2.6000			2.6000	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h	361	407		728	821			12			39	
Entry Volume veh/h	354	399		714	805			12			38	
Circulating Flow (Vc), pc/h	34			23			789			1481		
Exiting Flow (Vex), pc/h	778			1486			91			13		
Capacity (cPCE), pc/h	1394	1398		1409	1411			643			328	
Capacity (c), veh/h	1367	1370		1381	1384			630			322	
v/c Ratio (X)	0.26	0.29		0.52	0.58			0.02			0.12	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh	4.8	5.2		7.9	9.1			5.9			13.3	
Lane LOS	A	A		A	A			A			B	
95% Queue	1.0	1.2		3.1	4.0			0.1			0.4	
Approach Delay, s/veh	5.0			8.5			5.9			13.3		
Approach LOS	A			A			A			B		
Intersection Delay, s/veh / LOS	7.5						A					

HCS 2010 Roundabout Report

General Information

Analyst	AECOM
Agency or Co.	WisDOT
Date Performed	1/5/2021
Analysis Year	2020
Time Period	PM Peak
Project Description	1630-08-00 La Crosse Safety & Ops Study

Site Information

Intersection	62. USH 14/61 (South Ave) & 16th St / Castle Pl
E/W Street Name	USH 14/61 (South Ave)
N/S Street Name	16th St / Castle Pl
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	WisDOT

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	2	0	0	0	2	0	0	0	1	0	0	0	1	0
Lane Assignment	LT		TR		LT		TR				LTR				LTR	
Volume (V), veh/h	0	8	1486	9	0	0	987	95	0	6	3	0	0	37	0	17
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	9	1648	10	0	0	1094	105	0	7	3	0	0	41	0	19
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				2				2			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)	4.7000	4.4000		4.7000	4.4000			4.8000			4.8000	
Follow-Up Headway (sec)	2.5000	2.5000		2.5000	2.5000			2.6000			2.6000	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h	783	884		564	635			10			60	
Entry Volume veh/h	768	866		552	623			10			59	
Circulating Flow (Vc), pc/h	41			19			1698			1101		
Exiting Flow (Vex), pc/h	1689			1120			117			10		
Capacity (cPCE), pc/h	1385	1389		1414	1416			266			475	
Capacity (c), veh/h	1357	1362		1386	1388			260			465	
v/c Ratio (X)	0.57	0.64		0.40	0.45			0.04			0.13	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh	8.9	10.3		6.3	6.9			14.5			9.5	
Lane LOS	A	B		A	A			B			A	
95% Queue	3.7	4.9		2.0	2.4			0.1			0.4	
Approach Delay, s/veh	9.6			6.6			14.5			9.5		
Approach LOS	A			A			B			A		
Intersection Delay, s/veh / LOS	8.4						A					

HCS 2010 Roundabout Report

General Information

Analyst	AECOM
Agency or Co.	WisDOT
Date Performed	1/5/2021
Analysis Year	2020
Time Period	AM Peak
Project Description	1630-08-00 La Crosse Safety & Ops Study

Site Information

Intersection	63. USH 14/61 (South Ave) & Ward Ave / East Ave
E/W Street Name	USH 14/61 (South Ave)
N/S Street Name	Ward Ave / East Ave
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.86
Jurisdiction	WisDOT

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	2	0	0	0	2	0	0	1	1	0	0	0	1	1
Lane Assignment	LT		TR		LT		TR		L		LTR		LT		R	
Volume (V), veh/h	0	144	414	110	0	10	1067	13	0	71	33	14	0	4	108	243
Percent Heavy Vehicles, %	7	7	7	7	2	2	2	2	4	4	4	4	4	4	4	4
Flow Rate (vPCE) pc/h	0	179	515	137	0	12	1266	15	0	86	40	17	0	5	131	294
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				2				2				2			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)	4.7000	4.4000		4.6000	4.3000		4.6000	4.3000		4.6000	4.3000	
Follow-Up Headway (sec)	2.5000	2.5000		2.6000	2.6000		2.6000	2.6000		2.6000	2.6000	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h	391	440		608	685		76	67		136	294	
Entry Volume veh/h	365	412		596	672		73	65		131	283	
Circulating Flow (Vc), pc/h	148			305			699			1364		
Exiting Flow (Vex), pc/h	537			1646			234			280		
Capacity (cPCE), pc/h	1250	1265		1047	1074		730	773		397	444	
Capacity (c), veh/h	1168	1182		1026	1053		701	744		381	427	
v/c Ratio (X)	0.31	0.35		0.58	0.64		0.10	0.09		0.34	0.66	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh	6.0	6.4		11.1	12.4		6.2	5.7		16.0	26.7	
Lane LOS	A	A		B	B		A	A		C	D	
95% Queue	1.3	1.6		3.9	4.8		0.3	0.3		1.5	4.7	
Approach Delay, s/veh	6.2			11.8			6.0			23.3		
Approach LOS	A			B			A			C		
Intersection Delay, s/veh / LOS	11.7						B					

HCS 2010 Roundabout Report

General Information

Analyst	AECOM
Agency or Co.	WisDOT
Date Performed	1/5/2021
Analysis Year	2020
Time Period	PM Peak
Project Description	1630-08-00 La Crosse Safety & Ops Study

Site Information

Intersection	63. USH 14/61 (South Ave) & Ward Ave / East Ave
E/W Street Name	USH 14/61 (South Ave)
N/S Street Name	Ward Ave / East Ave
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.88
Jurisdiction	WisDOT

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	2	0	0	0	2	0	0	1	1	0	0	0	1	1
Lane Assignment	LT		TR		LT		TR		L		LTR		LT		R	
Volume (V), veh/h	0	276	1074	79	0	23	693	29	0	142	125	29	0	28	51	203
Percent Heavy Vehicles, %	0	0	0	0	2	2	2	2	0	0	0	0	3	3	3	3
Flow Rate (vPCE) pc/h	0	314	1220	90	0	27	803	34	0	161	142	33	0	33	60	238
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				2				2				2			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

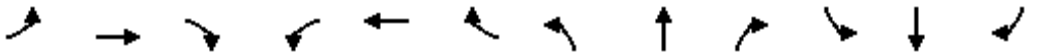
Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)	4.7000	4.4000		4.6000	4.3000		4.6000	4.3000		4.6000	4.3000	
Follow-Up Headway (sec)	2.5000	2.5000		2.6000	2.6000		2.6000	2.6000		2.6000	2.6000	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h	763	861		406	458		161	175		93	238	
Entry Volume veh/h	763	861		398	449		161	175		90	231	
Circulating Flow (Vc), pc/h	120			617			1567			991		
Exiting Flow (Vex), pc/h	1286			1202			490			177		
Capacity (cPCE), pc/h	1284	1296		787	828		329	375		558	606	
Capacity (c), veh/h	1284	1296		771	812		329	375		542	589	
v/c Ratio (X)	0.59	0.66		0.52	0.55		0.49	0.47		0.17	0.39	

Delay and Level of Service

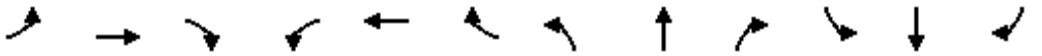
Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh	9.8	11.4		12.1	12.5		23.4	20.0		8.8	12.0	
Lane LOS	A	B		B	B		C	C		A	B	
95% Queue	4.1	5.4		3.0	3.4		2.6	2.4		0.6	1.9	
Approach Delay, s/veh	10.6			12.3			21.7			11.1		
Approach LOS	B			B			C			B		
Intersection Delay, s/veh / LOS	12.3						B					



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	73	30	38	242	90	66	608	47	41	347	168
Future Volume (veh/h)	87	73	30	38	242	90	66	608	47	41	347	168
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1682	1682	1682	1695	1763	1695	1628	1695	1695	1668	1668	1668
Adj Flow Rate, veh/h	94	78	32	41	260	97	71	654	51	44	373	112
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	5	5	5	4	4	4	4	4	4	6	6	6
Cap, veh/h	261	272	111	459	294	110	492	1102	86	375	1071	478
Arrive On Green	0.07	0.24	0.24	0.07	0.24	0.24	0.11	0.36	0.36	0.08	0.34	0.34
Sat Flow, veh/h	1602	1133	465	1615	1224	457	1550	3028	236	1589	3169	1414
Grp Volume(v), veh/h	94	0	110	41	0	357	71	348	357	44	373	112
Grp Sat Flow(s),veh/h/ln	1602	0	1598	1615	0	1681	1550	1611	1653	1589	1585	1414
Q Serve(g_s), s	2.9	0.0	3.8	1.2	0.0	13.7	1.7	11.7	11.8	1.1	5.9	3.8
Cycle Q Clear(g_c), s	2.9	0.0	3.8	1.2	0.0	13.7	1.7	11.7	11.8	1.1	5.9	3.8
Prop In Lane	1.00		0.29	1.00		0.27	1.00		0.14	1.00		1.00
Lane Grp Cap(c), veh/h	261	0	383	459	0	404	492	586	602	375	1071	478
V/C Ratio(X)	0.36	0.00	0.29	0.09	0.00	0.88	0.14	0.59	0.59	0.12	0.35	0.23
Avail Cap(c_a), veh/h	620	0	1071	940	0	1127	900	1440	1478	953	2833	1264
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.3	0.0	20.8	16.3	0.0	24.6	10.7	17.3	17.3	12.4	16.7	16.0
Incr Delay (d2), s/veh	0.3	0.0	0.2	0.0	0.0	2.6	0.0	1.0	0.9	0.1	0.2	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	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	1.9	0.0	2.5	0.8	0.0	8.5	1.0	6.9	7.0	0.7	3.7	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.7	0.0	21.0	16.3	0.0	27.1	10.7	18.3	18.3	12.4	16.9	16.2
LnGrp LOS	B	A	C	B	A	C	B	B	B	B	B	B
Approach Vol, veh/h		204			398			776			529	
Approach Delay, s/veh		19.9			26.0			17.6			16.4	
Approach LOS		B			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.6	29.4	7.9	21.1	10.3	27.7	8.0	21.1
Change Period (Y+Rc), s	3.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0
Max Green Setting (Gmax), s	30.0	60.0	20.0	45.0	25.0	60.0	25.0	45.0
Max Q Clear Time (g_c+I1), s	3.1	13.8	4.9	15.7	3.7	7.9	3.2	5.8
Green Ext Time (p_c), s	0.0	10.7	0.1	0.4	0.1	4.0	0.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	19.3
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	234	191	52	87	122	53	42	479	83	60	634	147
Future Volume (veh/h)	234	191	52	87	122	53	42	479	83	60	634	147
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1723	1723	1723	1792	1723	1614	1682	1682	1723	1723	1723
Adj Flow Rate, veh/h	266	217	59	99	139	60	48	544	94	68	720	104
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	5	5	5	2	2	2
Cap, veh/h	412	296	80	321	174	75	359	940	162	427	1192	531
Arrive On Green	0.16	0.23	0.23	0.08	0.15	0.15	0.09	0.34	0.34	0.11	0.36	0.36
Sat Flow, veh/h	1641	1304	355	1641	1187	512	1538	2726	469	1641	3273	1460
Grp Volume(v), veh/h	266	0	276	99	0	199	48	318	320	68	720	104
Grp Sat Flow(s),veh/h/ln	1641	0	1659	1641	0	1699	1538	1598	1597	1641	1637	1460
Q Serve(g_s), s	8.5	0.0	10.3	3.3	0.0	7.6	1.2	10.9	10.9	1.6	12.0	3.3
Cycle Q Clear(g_c), s	8.5	0.0	10.3	3.3	0.0	7.6	1.2	10.9	10.9	1.6	12.0	3.3
Prop In Lane	1.00		0.21	1.00		0.30	1.00		0.29	1.00		1.00
Lane Grp Cap(c), veh/h	412	0	376	321	0	248	359	551	551	427	1192	531
V/C Ratio(X)	0.65	0.00	0.73	0.31	0.00	0.80	0.13	0.58	0.58	0.16	0.60	0.20
Avail Cap(c_a), veh/h	639	0	1119	803	0	1147	799	1437	1437	989	2945	1314
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.3	0.0	23.9	21.4	0.0	27.5	12.0	17.9	17.9	11.3	17.3	14.5
Incr Delay (d2), s/veh	0.6	0.0	1.0	0.2	0.0	2.3	0.1	1.0	1.0	0.1	0.5	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	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	5.4	0.0	6.5	2.2	0.0	5.4	0.7	6.4	6.5	1.0	6.9	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.0	0.0	25.0	21.6	0.0	29.8	12.0	18.8	18.9	11.4	17.8	14.7
LnGrp LOS	B	A	C	C	A	C	B	B	B	B	B	B
Approach Vol, veh/h		542			298			686			892	
Approach Delay, s/veh		22.0			27.1			18.4			16.9	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.2	28.0	13.8	14.7	8.9	29.3	8.4	20.1
Change Period (Y+Rc), s	3.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0
Max Green Setting (Gmax), s	30.0	60.0	20.0	45.0	25.0	60.0	25.0	45.0
Max Q Clear Time (g_c+I1), s	3.6	12.9	10.5	9.6	3.2	14.0	5.3	12.3
Green Ext Time (p_c), s	0.1	9.5	0.2	0.2	0.0	10.3	0.1	0.3

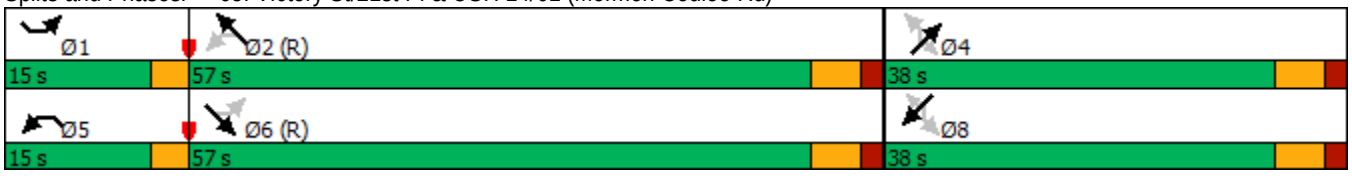
Intersection Summary	
HCM 6th Ctrl Delay	19.7
HCM 6th LOS	B

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	17	378	13	20	1106	50	9	6	3	39	28	44
Future Volume (vph)	17	378	13	20	1106	50	9	6	3	39	28	44
Satd. Flow (prot)	1398	3134	0	1521	3407	0	0	1699	1438	0	1541	1444
Flt Permitted	0.172			0.490				0.797			0.812	
Satd. Flow (perm)	253	3134	0	785	3407	0	0	1395	1438	0	1288	1444
Satd. Flow (RTOR)												
Lane Group Flow (vph)	20	455	0	23	1344	0	0	17	2	0	78	32
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4		4	8		8
Total Split (s)	15.0	57.0		15.0	57.0		38.0	38.0	38.0	38.0	38.0	38.0
Total Lost Time (s)	3.0	6.0		3.0	6.0			6.0	6.0		6.0	6.0
Act Effct Green (s)	90.4	85.7		90.4	85.7			12.6	12.6		12.6	12.6
Actuated g/C Ratio	0.82	0.78		0.82	0.78			0.11	0.11		0.11	0.11
v/c Ratio	0.07	0.19		0.03	0.51			0.11	0.01		0.53	0.19
Control Delay	3.2	5.2		0.2	2.4			43.5	41.0		58.5	45.6
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Delay	3.2	5.2		0.2	2.4			43.5	41.0		58.5	45.6
LOS	A	A		A	A			D	D		E	D
Approach Delay		5.1			2.4			43.2			54.8	
Approach LOS		A			A			D			D	
Queue Length 50th (ft)	2	34		1	4			11	1		53	21
Queue Length 95th (ft)	8	84		m0	73			30	8		93	46
Internal Link Dist (ft)		228			350			195			199	
Turn Bay Length (ft)	130			130					110			130
Base Capacity (vph)	335	2442		734	2654			405	418		374	420
Starvation Cap Reductn	0	0		0	0			0	0		0	0
Spillback Cap Reductn	0	0		0	0			0	0		0	0
Storage Cap Reductn	0	0		0	0			0	0		0	0
Reduced v/c Ratio	0.06	0.19		0.03	0.51			0.04	0.00		0.21	0.08

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 96 (87%), Referenced to phase 2:NWTL and 6:SETL, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.53
Intersection Signal Delay: 6.3 Intersection LOS: A
Intersection Capacity Utilization 64.9% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 65: Victory St/21st Pl & USH 14/61 (Mormon Coulee Rd)

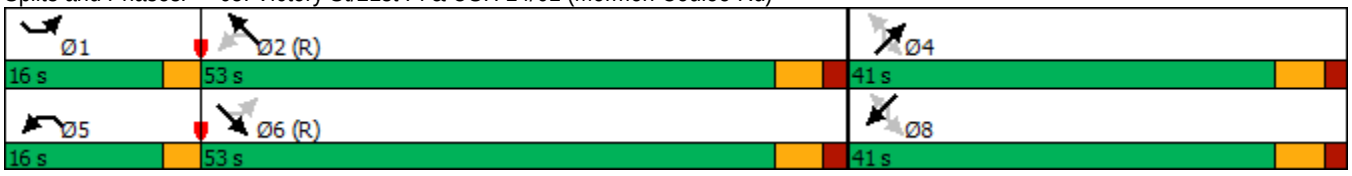


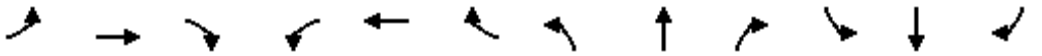
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	36	1087	11	11	694	42	24	25	22	96	24	28
Future Volume (vph)	36	1087	11	11	694	42	24	25	22	96	24	28
Satd. Flow (prot)	1521	3424	0	1521	3397	0	0	1708	1438	0	1511	1430
Flt Permitted	0.327			0.224				0.814			0.735	
Satd. Flow (perm)	524	3424	0	359	3397	0	0	1424	1438	0	1154	1430
Satd. Flow (RTOR)												
Lane Group Flow (vph)	37	1132	0	11	758	0	0	51	14	0	124	18
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4		4	8		8
Total Split (s)	16.0	53.0		16.0	53.0		41.0	41.0	41.0	41.0	41.0	41.0
Total Lost Time (s)	3.0	6.0		3.0	6.0			6.0	6.0		6.0	6.0
Act Effct Green (s)	82.9	78.2		81.0	73.8			17.7	17.7		17.7	17.7
Actuated g/C Ratio	0.75	0.71		0.74	0.67			0.16	0.16		0.16	0.16
v/c Ratio	0.08	0.47		0.03	0.33			0.22	0.06		0.67	0.08
Control Delay	5.0	9.2		3.5	9.3			39.7	35.8		59.5	36.2
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Delay	5.0	9.2		3.5	9.3			39.7	35.8		59.5	36.2
LOS	A	A		A	A			D	D		E	D
Approach Delay		9.1			9.3			38.9			56.6	
Approach LOS		A			A			D			E	
Queue Length 50th (ft)	5	143		1	44			32	9		84	11
Queue Length 95th (ft)	19	333		m0	345			61	24		134	29
Internal Link Dist (ft)		228			350			245			217	
Turn Bay Length (ft)	130			130					110			130
Base Capacity (vph)	514	2434		409	2280			453	457		367	455
Starvation Cap Reductn	0	0		0	0			0	0		0	0
Spillback Cap Reductn	0	0		0	0			0	0		0	0
Storage Cap Reductn	0	0		0	0			0	0		0	0
Reduced v/c Ratio	0.07	0.47		0.03	0.33			0.11	0.03		0.34	0.04

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 38 (35%), Referenced to phase 2:NWTL and 6:SETL, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.67
Intersection Signal Delay: 13.2 Intersection LOS: B
Intersection Capacity Utilization 63.1% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 65: Victory St/21st Pl & USH 14/61 (Mormon Coulee Rd)





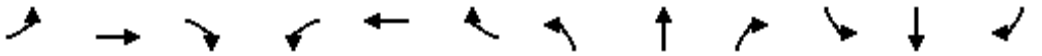
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	55	4	225	68	32	8	1098	466	19	339	48
Future Volume (veh/h)	53	55	4	225	68	32	8	1098	466	19	339	48
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1668	1668	1668	1641	1641	1641	1723	1831	1723	1627	1729	1627
Adj Flow Rate, veh/h	60	62	5	256	77	36	9	1248	328	22	385	34
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	6	6	6	8	8	8	2	2	2	9	9	9
Cap, veh/h	127	238	19	415	140	66	596	1996	1032	203	1923	807
Arrive On Green	0.08	0.08	0.08	0.13	0.13	0.13	0.01	0.57	0.57	0.02	0.59	0.59
Sat Flow, veh/h	1589	2973	237	3125	1057	494	1641	3479	1460	1550	3286	1379
Grp Volume(v), veh/h	60	33	34	256	0	113	9	1248	328	22	385	34
Grp Sat Flow(s),veh/h/ln	1589	1585	1625	1563	0	1552	1641	1739	1460	1550	1643	1379
Q Serve(g_s), s	4.0	2.1	2.2	8.5	0.0	7.5	0.3	26.2	9.3	0.6	6.1	1.2
Cycle Q Clear(g_c), s	4.0	2.1	2.2	8.5	0.0	7.5	0.3	26.2	9.3	0.6	6.1	1.2
Prop In Lane	1.00		0.15	1.00		0.32	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	127	127	130	415	0	206	596	1996	1032	203	1923	807
V/C Ratio(X)	0.47	0.26	0.26	0.62	0.00	0.55	0.02	0.63	0.32	0.11	0.20	0.04
Avail Cap(c_a), veh/h	173	173	177	909	0	451	757	1996	1032	338	1923	807
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.4	47.5	47.5	45.0	0.0	44.6	9.6	15.6	6.1	12.4	10.7	9.7
Incr Delay (d2), s/veh	2.7	1.1	1.1	1.5	0.0	2.3	0.0	1.5	0.8	0.2	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	3.0	1.6	1.7	5.8	0.0	5.3	0.2	13.9	7.0	0.4	3.8	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.1	48.6	48.6	46.5	0.0	46.9	9.7	17.1	6.9	12.7	11.0	9.8
LnGrp LOS	D	D	D	D	A	D	A	B	A	B	B	A
Approach Vol, veh/h		127			369			1585			441	
Approach Delay, s/veh		49.8			46.6			14.9			11.0	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.2	70.4		20.6	5.4	69.1		14.8				
Change Period (Y+Rc), s	3.0	6.0		6.0	3.0	6.0		6.0				
Max Green Setting (Gmax), s	12.0	33.0		32.0	12.0	33.0		12.0				
Max Q Clear Time (g_c+I1), s	2.3	8.1		10.5	2.6	28.2		6.0				
Green Ext Time (p_c), s	0.0	7.0		4.1	0.0	4.4		0.4				

Intersection Summary			
HCM 6th Ctrl Delay		20.6	
HCM 6th LOS		C	

Notes

User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	102	84	24	539	97	25	31	600	375	27	1024	130
Future Volume (veh/h)	102	84	24	539	97	25	31	600	375	27	1024	130
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1736	1736	1723	1723	1723	1709	1816	1709	1723	1831	1723
Adj Flow Rate, veh/h	106	88	25	561	101	26	32	625	242	28	1067	84
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	2	2	2	3	3	3	2	2	2
Cap, veh/h	153	237	65	754	304	78	217	1589	1000	326	1594	669
Arrive On Green	0.09	0.09	0.09	0.23	0.23	0.23	0.03	0.46	0.46	0.03	0.46	0.46
Sat Flow, veh/h	1654	2559	700	3281	1321	340	1628	3451	1448	1641	3479	1460
Grp Volume(v), veh/h	106	56	57	561	0	127	32	625	242	28	1067	84
Grp Sat Flow(s),veh/h/ln	1654	1650	1610	1641	0	1661	1628	1726	1448	1641	1739	1460
Q Serve(g_s), s	6.8	3.5	3.7	17.5	0.0	7.0	1.1	13.1	6.8	1.0	26.4	3.6
Cycle Q Clear(g_c), s	6.8	3.5	3.7	17.5	0.0	7.0	1.1	13.1	6.8	1.0	26.4	3.6
Prop In Lane	1.00		0.44	1.00		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	153	153	149	754	0	382	217	1589	1000	326	1594	669
V/C Ratio(X)	0.69	0.36	0.39	0.74	0.00	0.33	0.15	0.39	0.24	0.09	0.67	0.13
Avail Cap(c_a), veh/h	286	285	278	955	0	483	260	1589	1000	373	1594	669
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.4	46.9	47.0	39.3	0.0	35.3	18.2	19.6	6.3	15.7	23.3	17.1
Incr Delay (d2), s/veh	5.5	1.4	1.6	2.4	0.0	0.5	0.3	0.7	0.6	0.1	2.3	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	0.0	0.0	0.0
%ile BackOfQ(90%),veh/ln	5.3	2.7	2.8	10.8	0.0	5.1	0.8	8.1	6.5	0.7	14.9	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.9	48.3	48.6	41.7	0.0	35.8	18.5	20.3	6.9	15.8	25.5	17.5
LnGrp LOS	D	D	D	D	A	D	B	C	A	B	C	B
Approach Vol, veh/h		219			688			899			1179	
Approach Delay, s/veh		51.1			40.6			16.6			24.7	
Approach LOS		D			D			B			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.1	56.4		31.3	5.9	56.6		16.2				
Change Period (Y+Rc), s	3.0	6.0		6.0	3.0	6.0		6.0				
Max Green Setting (Gmax), s	6.0	32.0		32.0	6.0	32.0		19.0				
Max Q Clear Time (g_c+I1), s	3.1	28.4		19.5	3.0	15.1		8.8				
Green Ext Time (p_c), s	0.0	3.2		5.8	0.0	8.1		1.4				

Intersection Summary			
HCM 6th Ctrl Delay		27.9	
HCM 6th LOS		C	

Notes

User approved volume balancing among the lanes for turning movement.

Appendix 5: Traffic Signal Warrant Analysis

Wisconsin Department of Transportation Traffic Signal Warrant Summary Worksheet

70%

The Worksheet(s) attached are provided as an attachment to the Engineering Investigation Study for:

Intersection: STH 16 & 12th Ave NB Ramps
County: La Crosse
City: La Crosse

Major Street: STH 16
Critical Approach Speed: 45 mph
Lanes: 2 or more lanes

Minor Street: 12th Ave NB Ramps
Critical Approach Speed: 25 mph
Lanes: 1 lane

% Right Turns Included
From North (SB) 0%
From East (WB) 100%
From South (NB) 100%
From West (EB) 0%

In built-up area of isolated community of < 10,000 population? No
Total number of approaches at intersection? 3
If it is a "T" intersection, inflate minor threshold to 150%? Yes
Manually set volume level? No

Analysis based on EXISTING volume data.

Date	Day of the Week	Time (HH:MM)			
		From	AM / PM	To	AM / PM
9/29/2020	Tuesday	6:00	AM	7:00	PM

Warrant Evaluation Summary	Warrant Met:
Warrant 1: Eight - Hour Vehicular Volume	No
Condition A: Minimum Vehicular Volume	No
Condition B: Interruption of Continuous Traffic	No
Condition C: Combination: 80% of A and B	No
Warrant 2: Four-Hour Volume	No
Warrant 3: Peak Hour Volume	N/A
Warrant 4: Pedestrian Volume	N/A
Criterion A: Four-Hour	
Criterion B: Peak-Hour	
Warrant 5: School Crossing	N/A
Warrant 6: Coordinated Signal System	N/A
Warrant 7: Crash Experience	N/A
Warrant 8: Roadway Network	N/A
Warrant 9: Intersection Near a Grade Crossing	N/A

Warrant Analysis Conducted By:
Name: Jeff Sandberg
Agency: AECOM
Date: 1/6/2021

Warrant 1: Eight - Hour Vehicular Volume 70%

Warrant Evaluated? Yes Warrant Satisfied? No Manually Set To:

Condition A : Min. Veh. Volume		
Volume Level	70%	56%
Major Rd. Req	420	336
Minor Rd. Req	157.5	126
Number of Hours	0	0

Satisfied? No

Condition B: Interruption of Continuous Traffic		
Volume Level	70%	56%
Major Rd. Req	630	504
Minor Rd. Req	79.5	63
Number of Hours	0	0

Satisfied? No

Condition C: Combination of A & B at 56%

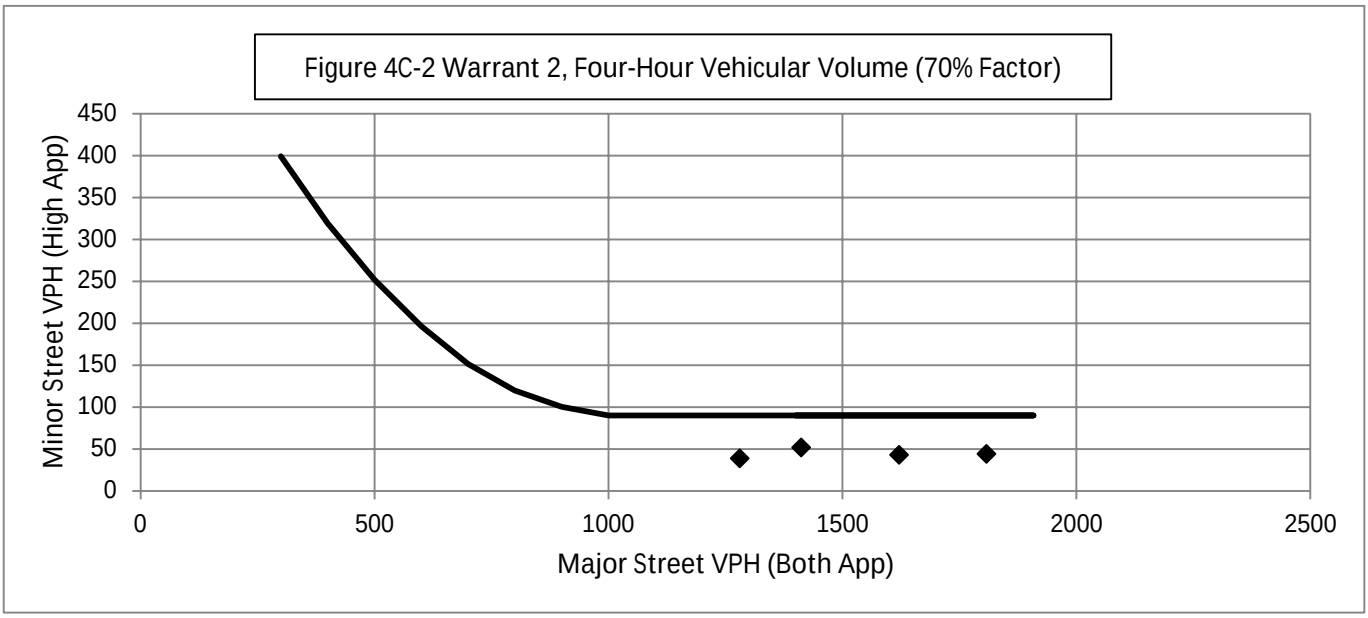
Satisfied? No

6:00 AM	Enter Start Time (Military Time) (HH:MM)				
Time Period	From	To	Major Road: Both App. (VPH)	Minor Road: High App. (VPH)	Total
1	6:00	7:00	730	12	742
2	7:00	8:00	1191	19	1210
3	8:00	9:00	946	21	967
4	9:00	10:00	914	28	942
5	10:00	11:00	1154	28	1182
6	11:00	12:00	1221	25	1246
7	12:00	13:00	1315	33	1348
8	13:00	14:00	1281	39	1320
9	14:00	15:00	1417	38	1455
10	15:00	16:00	1621	43	1664
11	16:00	17:00	1808	44	1852
12	17:00	18:00	1412	52	1464
13	18:00	19:00	900	33	933
14	19:00	20:00	0	0	0
15	20:00	21:00	0	0	0
16	21:00	22:00	0	0	0

Warrant 2: Four-Hour Volume 70%

Warrant Evaluated? Yes
Warrant Satisfied? No
Manually Set To:

Hour Start	17:00	16:00	15:00	13:00
Major Road Vol.	1412	1808	1621	1281
Minor Road Vol.	52	44	43	39



Wisconsin Department of Transportation Traffic Signal Warrant Summary Worksheet

70%

The Worksheet(s) attached are provided as an attachment to the Engineering Investigation Study for:

Intersection: STH 16 & 12th Ave SB Ramps
County: La Crosse
City: La Crosse

Major Street: STH 16
Critical Approach Speed: 45 mph
Lanes: 2 or more lanes

Minor Street: 12th Ave SB Ramps
Critical Approach Speed: 25 mph
Lanes: 1 lane

% Right Turns Included
From North (SB) 100%
From East (WB) 0%
From South (NB) 0%
From West (EB) 100%

In built-up area of isolated community of < 10,000 population? No
Total number of approaches at intersection? 3
If it is a "T" intersection, inflate minor threshold to 150%? Yes
Manually set volume level? No

Analysis based on EXISTING volume data.

Date	Day of the Week	Time (HH:MM)			
		From	AM / PM	To	AM / PM
9/29/2020	Tuesday	6:00	AM	7:00	PM

Warrant Evaluation Summary	Warrant Met:
Warrant 1: Eight - Hour Vehicular Volume	No
Condition A: Minimum Vehicular Volume	No
Condition B: Interruption of Continuous Traffic	No
Condition C: Combination: 80% of A and B	No
Warrant 2: Four-Hour Volume	No
Warrant 3: Peak Hour Volume	N/A
Warrant 4: Pedestrian Volume	N/A
Criterion A: Four-Hour	
Criterion B: Peak-Hour	
Warrant 5: School Crossing	N/A
Warrant 6: Coordinated Signal System	N/A
Warrant 7: Crash Experience	N/A
Warrant 8: Roadway Network	N/A
Warrant 9: Intersection Near a Grade Crossing	N/A

Warrant Analysis Conducted By:
Name: Jeff Sandberg
Agency: AECOM
Date: 1/6/2021

Warrant 1: Eight - Hour Vehicular Volume 70%

Warrant Evaluated? Yes Warrant Satisfied? No Manually Set To:

Condition A : Min. Veh. Volume		
Volume Level	70%	56%
Major Rd. Req	420	336
Minor Rd. Req	157.5	126
Number of Hours	0	0

Satisfied? No

Condition B: Interruption of Continuous Traffic		
Volume Level	70%	56%
Major Rd. Req	630	504
Minor Rd. Req	79.5	63
Number of Hours	0	0

Satisfied? No

Condition C: Combination of A & B at 56%

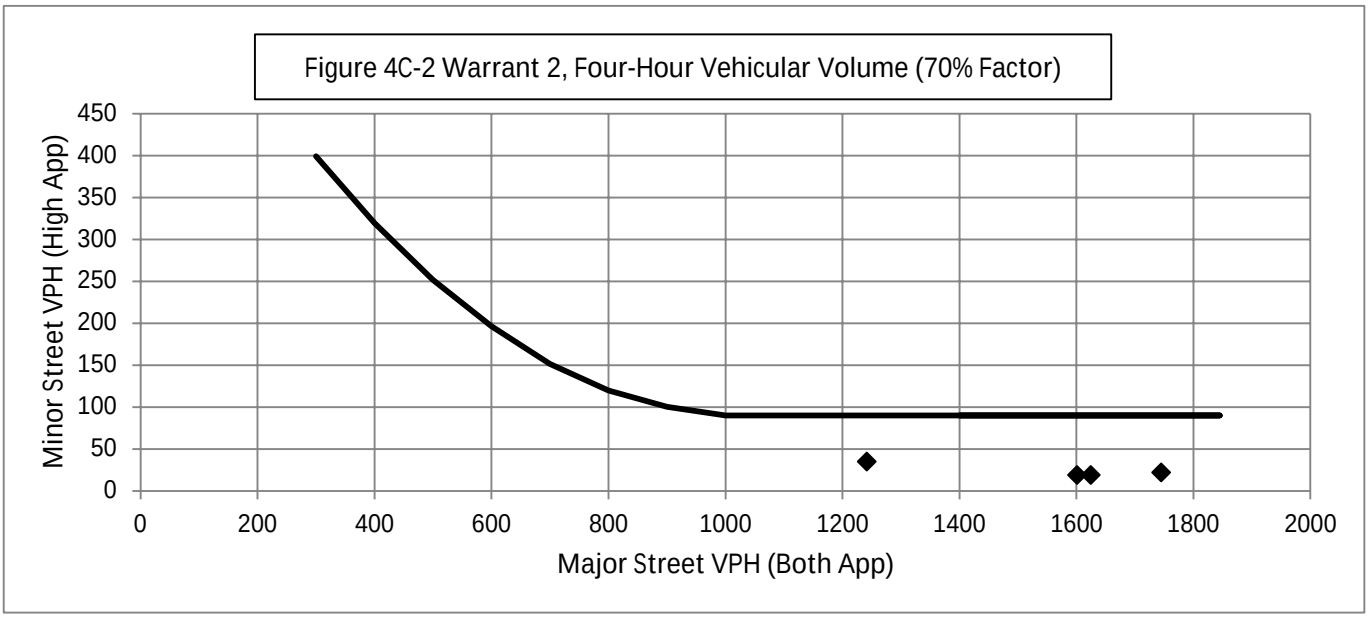
Satisfied? No

6:00 AM	Enter Start Time (Military Time) (HH:MM)				
Time Period	From	To	Major Road: Both App. (VPH)	Minor Road: High App. (VPH)	Total
1	6:00	7:00	759	17	776
2	7:00	8:00	1279	18	1297
3	8:00	9:00	972	13	985
4	9:00	10:00	955	17	972
5	10:00	11:00	1024	12	1036
6	11:00	12:00	1155	15	1170
7	12:00	13:00	1302	17	1319
8	13:00	14:00	1364	17	1381
9	14:00	15:00	1441	12	1453
10	15:00	16:00	1601	19	1620
11	16:00	17:00	1745	22	1767
12	17:00	18:00	1625	19	1644
13	18:00	19:00	1242	35	1277
14	19:00	20:00	0	0	0
15	20:00	21:00	0	0	0
16	21:00	22:00	0	0	0

Warrant 2: Four-Hour Volume 70%

Warrant Evaluated? Yes
Warrant Satisfied? No
Manually Set To:

Hour Start	18:00	16:00	15:00	17:00
Major Road Vol.	1242	1745	1601	1625
Minor Road Vol.	35	22	19	19



Wisconsin Department of Transportation Traffic Signal Warrant Summary Worksheet

100%

The Worksheet(s) attached are provided as an attachment to the Engineering Investigation Study for:

Intersection: USH 53 NB (Rose St) & Hagar St
County: La Crosse
City: La Crosse

Major Street: USH 53 NB (Rose St)
Critical Approach Speed: 30 mph
Lanes: 2 or more lanes

Minor Street: Hagar St
Critical Approach Speed: 25 mph
Lanes: 1 lane

% Right Turns Included
From North (SB) 0%
From East (WB) 100%
From South (NB) 100%
From West (EB) 100%

In built-up area of isolated community of < 10,000 population? No
Total number of approaches at intersection? 3
If it is a "T" intersection, inflate minor threshold to 150%? No
Manually set volume level? No

Analysis based on EXISTING volume data.

Date	Day of the Week	Time (HH:MM)			
		From	AM / PM	To	AM / PM
9/29/2020	Tuesday	6:00	AM	7:00	PM

Warrant Evaluation Summary	Warrant Met:
Warrant 1: Eight - Hour Vehicular Volume	No
Condition A: Minimum Vehicular Volume	No
Condition B: Interruption of Continuous Traffic	No
Condition C: Combination: 80% of A and B	No
Warrant 2: Four-Hour Volume	No
Warrant 3: Peak Hour Volume	N/A
Warrant 4: Pedestrian Volume	N/A
Criterion A: Four-Hour	
Criterion B: Peak-Hour	
Warrant 5: School Crossing	N/A
Warrant 6: Coordinated Signal System	N/A
Warrant 7: Crash Experience	N/A
Warrant 8: Roadway Network	N/A
Warrant 9: Intersection Near a Grade Crossing	N/A

Warrant Analysis Conducted By:
Name: Jeff Sandberg
Agency: AECOM
Date: 1/6/2021

Warrant 1: Eight - Hour Vehicular Volume 100%

Warrant Evaluated? Yes Warrant Satisfied? No Manually Set To:

Condition A : Min. Veh. Volume		
Volume Level	100%	80%
Major Rd. Req	600	480
Minor Rd. Req	150	120
Number of Hours	0	0

Satisfied? No

Condition B: Interruption of Continuous Traffic		
Volume Level	100%	80%
Major Rd. Req	900	720
Minor Rd. Req	75	60
Number of Hours	0	0

Satisfied? No

Condition C: Combination of A & B at 80%

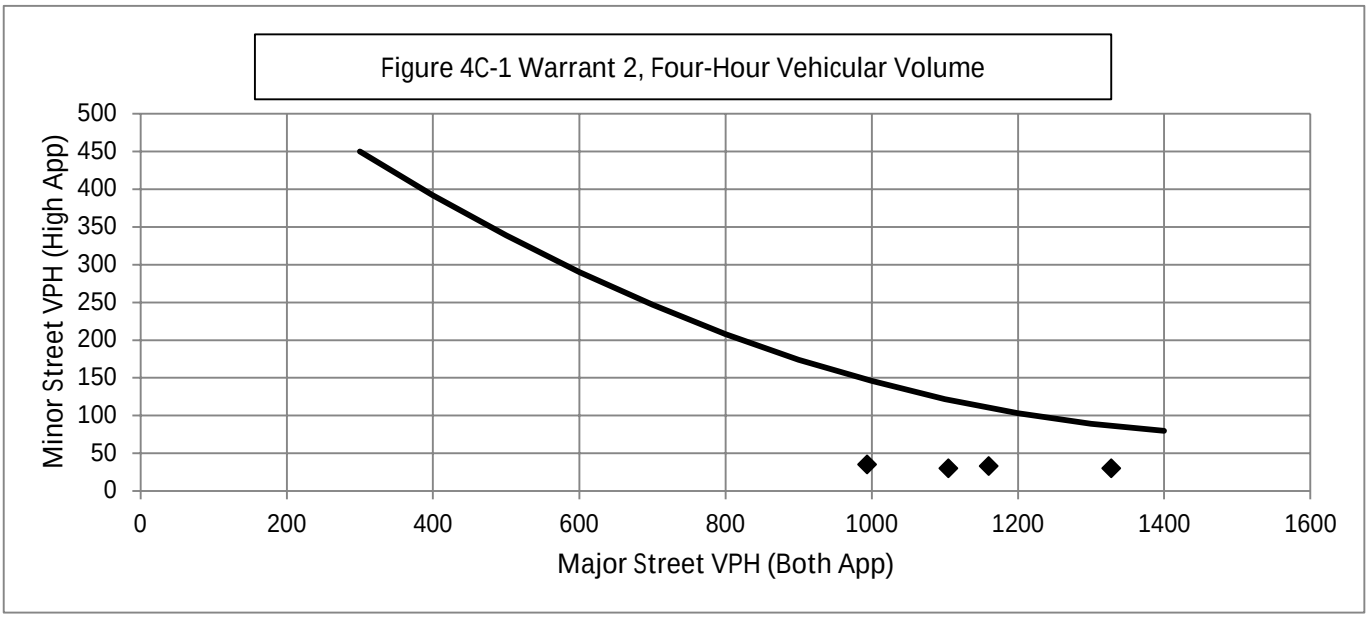
Satisfied? No

6:00 AM	Enter Start Time (Military Time) (HH:MM)				
Time Period	From	To	Major Road: Both App. (VPH)	Minor Road: High App. (VPH)	Total
1	6:00	7:00	328	8	336
2	7:00	8:00	503	22	525
3	8:00	9:00	532	14	546
4	9:00	10:00	589	21	610
5	10:00	11:00	697	22	719
6	11:00	12:00	779	39	818
7	12:00	13:00	851	28	879
8	13:00	14:00	849	26	875
9	14:00	15:00	994	35	1029
10	15:00	16:00	1160	33	1193
11	16:00	17:00	1328	30	1358
12	17:00	18:00	1105	30	1135
13	18:00	19:00	666	19	685
14	19:00	20:00	0	0	0
15	20:00	21:00	0	0	0
16	21:00	22:00	0	0	0

Warrant 2: Four-Hour Volume 100%

Warrant Evaluated? Yes
Warrant Satisfied? No
Manually Set To:

Hour Start	16:00	15:00	17:00	14:00
Major Road Vol.	1328	1160	1105	994
Minor Road Vol.	30	33	30	35



Wisconsin Department of Transportation Traffic Signal Warrant Summary Worksheet

100%

The Worksheet(s) attached are provided as an attachment to the Engineering Investigation Study for:

Intersection: USH 53 SB (Copeland Ave) & Hagar St
County: La Crosse
City: La Crosse

Major Street: USH 53 SB (Copeland Ave)
Critical Approach Speed: 30 mph
Lanes: 2 or more lanes

Minor Street: Hagar St
Critical Approach Speed: 25 mph
Lanes: 1 lane

% Right Turns Included
From North (SB) 100%
From East (WB) 100%
From South (NB) 0%
From West (EB) 100%

In built-up area of isolated community of < 10,000 population? No
Total number of approaches at intersection? 3
If it is a "T" intersection, inflate minor threshold to 150%? No
Manually set volume level? No

Analysis based on EXISTING volume data.

Date	Day of the Week	Time (HH:MM)			
		From	AM / PM	To	AM / PM
9/29/2020	Tuesday	6:00	AM	7:00	PM

Warrant Evaluation Summary	Warrant Met:
Warrant 1: Eight - Hour Vehicular Volume	No
Condition A: Minimum Vehicular Volume	No
Condition B: Interruption of Continuous Traffic	No
Condition C: Combination: 80% of A and B	No
Warrant 2: Four-Hour Volume	No
Warrant 3: Peak Hour Volume	N/A
Warrant 4: Pedestrian Volume	N/A
Criterion A: Four-Hour	
Criterion B: Peak-Hour	
Warrant 5: School Crossing	N/A
Warrant 6: Coordinated Signal System	N/A
Warrant 7: Crash Experience	N/A
Warrant 8: Roadway Network	N/A
Warrant 9: Intersection Near a Grade Crossing	N/A

Warrant Analysis Conducted By:
Name: Jeff Sandberg
Agency: AECOM
Date: 1/6/2021

Warrant 1: Eight - Hour Vehicular Volume 100%

Warrant Evaluated? Yes Warrant Satisfied? No Manually Set To:

Condition A : Min. Veh. Volume		
Volume Level	100%	80%
Major Rd. Req	600	480
Minor Rd. Req	150	120
Number of Hours	0	0

Satisfied? No

Condition B: Interruption of Continuous Traffic		
Volume Level	100%	80%
Major Rd. Req	900	720
Minor Rd. Req	75	60
Number of Hours	0	0

Satisfied? No

Condition C: Combination of A & B at 80%

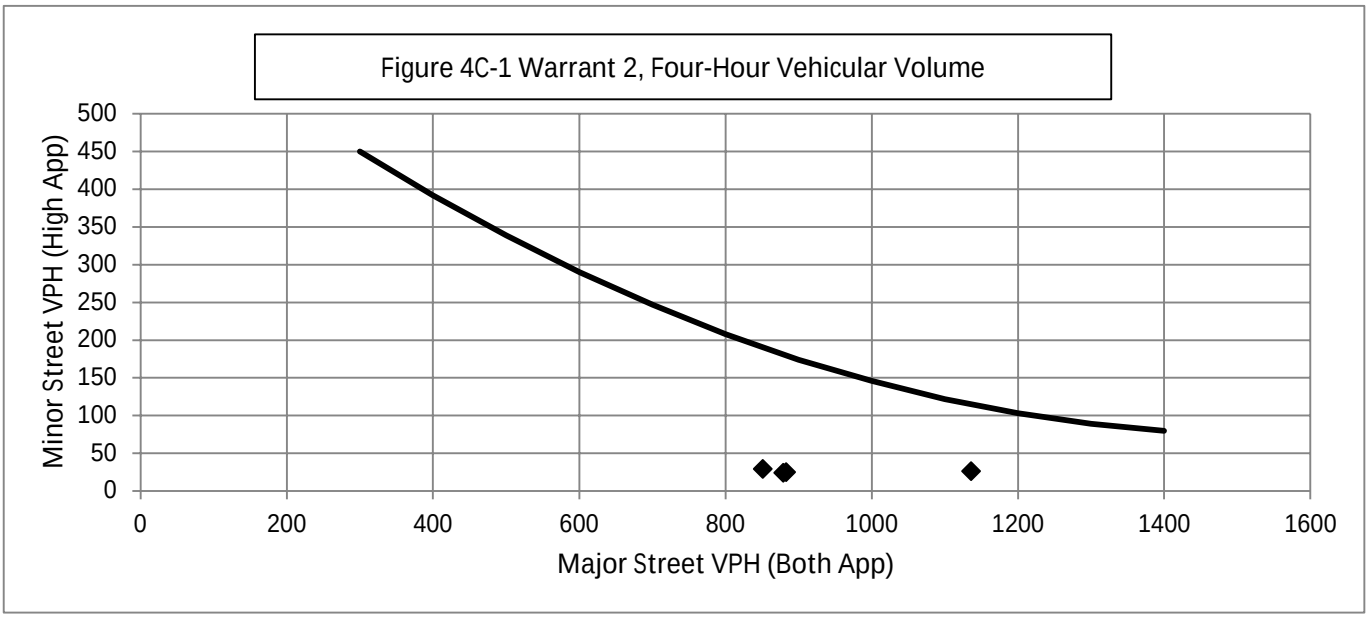
Satisfied? No

6:00 AM	Enter Start Time (Military Time) (HH:MM)				
Time Period	From	To	Major Road: Both App. (VPH)	Minor Road: High App. (VPH)	Total
1	6:00	7:00	733	11	744
2	7:00	8:00	1136	26	1162
3	8:00	9:00	808	14	822
4	9:00	10:00	708	14	722
5	10:00	11:00	699	23	722
6	11:00	12:00	722	29	751
7	12:00	13:00	838	30	868
8	13:00	14:00	879	24	903
9	14:00	15:00	851	29	880
10	15:00	16:00	883	25	908
11	16:00	17:00	811	37	848
12	17:00	18:00	776	27	803
13	18:00	19:00	617	14	631
14	19:00	20:00	0	0	0
15	20:00	21:00	0	0	0
16	21:00	22:00	0	0	0

Warrant 2: Four-Hour Volume 100%

Warrant Evaluated? Yes
Warrant Satisfied? No
Manually Set To:

Hour Start	7:00	15:00	13:00	14:00
Major Road Vol.	1136	883	879	851
Minor Road Vol.	26	25	24	29



Wisconsin Department of Transportation Traffic Signal Warrant Summary Worksheet

100%

The Worksheet(s) attached are provided as an attachment to the Engineering Investigation Study for:

Intersection: STH 16 (La Crosse St) & 7th St
County: La Crosse
City: La Crosse

Major Street: STH 16 (La Crosse St)
Critical Approach Speed: 25 mph
Lanes: 1 lane

Minor Street: 7th St
Critical Approach Speed: 25 mph
Lanes: 1 lane

% Right Turns Included
From North (SB) 100%
From East (WB) 0%
From South (NB) 0%
From West (EB) 50%

In built-up area of isolated community of < 10,000 population? No
Total number of approaches at intersection? 4 or more
If it is a "T" intersection, inflate minor threshold to 150%? No
Manually set volume level? No

Analysis based on EXISTING volume data.

Date	Day of the Week	Time (HH:MM)			
		From	AM / PM	To	AM / PM
9/29/2020	Tuesday	6:00	AM	7:00	PM

Warrant Evaluation Summary	Warrant Met:
Warrant 1: Eight - Hour Vehicular Volume	No
Condition A: Minimum Vehicular Volume	No
Condition B: Interruption of Continuous Traffic	No
Condition C: Combination: 80% of A and B	No
Warrant 2: Four-Hour Volume	No
Warrant 3: Peak Hour Volume	N/A
Warrant 4: Pedestrian Volume	N/A
Criterion A: Four-Hour	
Criterion B: Peak-Hour	
Warrant 5: School Crossing	N/A
Warrant 6: Coordinated Signal System	N/A
Warrant 7: Crash Experience	N/A
Warrant 8: Roadway Network	N/A
Warrant 9: Intersection Near a Grade Crossing	N/A

Warrant Analysis Conducted By:
Name: Jeff Sandberg
Agency: AECOM
Date: 1/6/2021

Warrant 1: Eight - Hour Vehicular Volume 100%

Warrant Evaluated? Yes Warrant Satisfied? No Manually Set To:

Condition A : Min. Veh. Volume		
Volume Level	100%	80%
Major Rd. Req	500	400
Minor Rd. Req	150	120
Number of Hours	1	1

Satisfied? No

Condition B: Interruption of Continuous Traffic		
Volume Level	100%	80%
Major Rd. Req	750	600
Minor Rd. Req	75	60
Number of Hours	0	4

Satisfied? No

Condition C: Combination of A & B at 80%

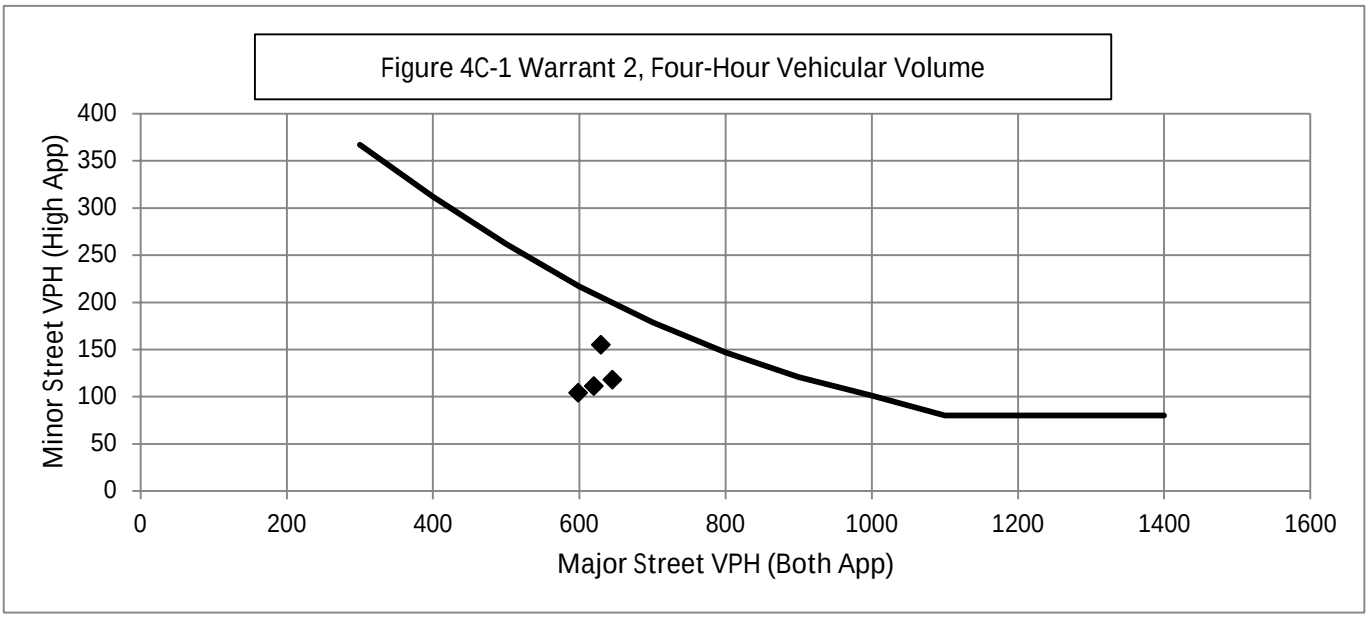
Satisfied? No

6:00 AM	Enter Start Time (Military Time) (HH:MM)				
Time Period	From	To	Major Road: Both App. (VPH)	Minor Road: High App. (VPH)	Total
1	6:00	7:00	177	38	215
2	7:00	8:00	365	73	437.5
3	8:00	9:00	338	60	397.5
4	9:00	10:00	359	54	412.5
5	10:00	11:00	431	82	513
6	11:00	12:00	546	94	640
7	12:00	13:00	601	101	701.5
8	13:00	14:00	553	90	643
9	14:00	15:00	599	104	702.5
10	15:00	16:00	646	118	763.5
11	16:00	17:00	630	155	784.5
12	17:00	18:00	620	111	731
13	18:00	19:00	509	57	565.5
14	19:00	20:00	0	0	0
15	20:00	21:00	0	0	0
16	21:00	22:00	0	0	0

Warrant 2: Four-Hour Volume 100%

Warrant Evaluated? Yes
Warrant Satisfied? No
Manually Set To:

Hour Start	16:00	15:00	17:00	14:00
Major Road Vol.	629.5	645.5	620	598.5
Minor Road Vol.	155	118	111	104



Wisconsin Department of Transportation Traffic Signal Warrant Summary Worksheet

100%

The Worksheet(s) attached are provided as an attachment to the Engineering Investigation Study for:

Intersection: USH 53 SB (3rd St) & Vine St
County: La Crosse
City: La Crosse

Major Street: USH 53 SB (3rd St)
Critical Approach Speed: 25 mph
Lanes: 2 or more lanes

Minor Street: Vine St
Critical Approach Speed: 25 mph
Lanes: 1 lane

% Right Turns Included
From North (SB) 100%
From East (WB) 0%
From South (NB) 0%
From West (EB) 100%

In built-up area of isolated community of < 10,000 population? No
Total number of approaches at intersection? 3
If it is a "T" intersection, inflate minor threshold to 150%? No
Manually set volume level? No

Analysis based on EXISTING volume data.

Date	Day of the Week	Time (HH:MM)			
		From	AM / PM	To	AM / PM
9/29/2020	Tuesday	6:00	AM	7:00	PM

Warrant Evaluation Summary	Warrant Met:
Warrant 1: Eight - Hour Vehicular Volume	No
Condition A: Minimum Vehicular Volume	No
Condition B: Interruption of Continuous Traffic	No
Condition C: Combination: 80% of A and B	No
Warrant 2: Four-Hour Volume	No
Warrant 3: Peak Hour Volume	N/A
Warrant 4: Pedestrian Volume	N/A
Criterion A: Four-Hour	
Criterion B: Peak-Hour	
Warrant 5: School Crossing	N/A
Warrant 6: Coordinated Signal System	N/A
Warrant 7: Crash Experience	N/A
Warrant 8: Roadway Network	N/A
Warrant 9: Intersection Near a Grade Crossing	N/A

Warrant Analysis Conducted By:
Name: Jeff Sandberg
Agency: AECOM
Date: 1/7/2021

Warrant 1: Eight - Hour Vehicular Volume 100%

Warrant Evaluated? Yes Warrant Satisfied? No Manually Set To:

Condition A : Min. Veh. Volume		
Volume Level	100%	80%
Major Rd. Req	600	480
Minor Rd. Req	150	120
Number of Hours	0	0

Satisfied? No

Condition B: Interruption of Continuous Traffic		
Volume Level	100%	80%
Major Rd. Req	900	720
Minor Rd. Req	75	60
Number of Hours	0	0

Satisfied? No

Condition C: Combination of A & B at 80%

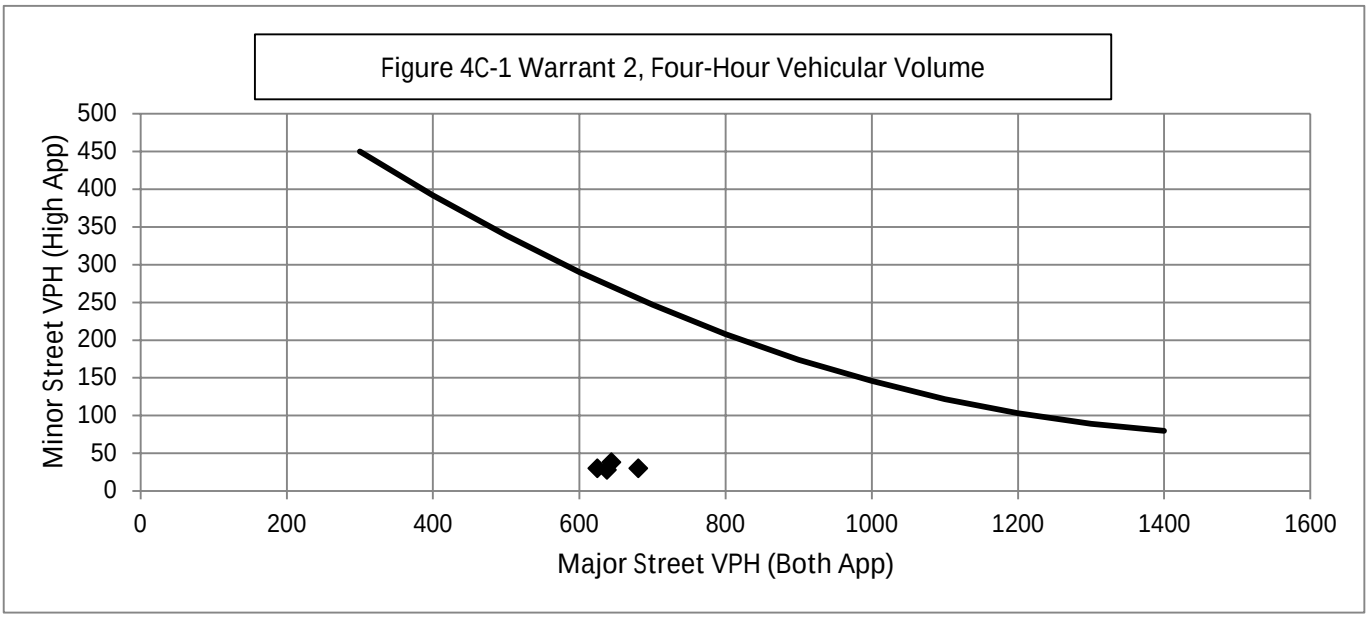
Satisfied? No

6:00 AM	Enter Start Time (Military Time) (HH:MM)				
Time Period	From	To	Major Road: Both App. (VPH)	Minor Road: High App. (VPH)	Total
1	6:00	7:00	441	16	457
2	7:00	8:00	638	28	666
3	8:00	9:00	537	29	566
4	9:00	10:00	502	36	538
5	10:00	11:00	506	40	546
6	11:00	12:00	532	34	566
7	12:00	13:00	629	27	656
8	13:00	14:00	620	30	650
9	14:00	15:00	681	30	711
10	15:00	16:00	625	30	655
11	16:00	17:00	644	38	682
12	17:00	18:00	577	37	614
13	18:00	19:00	484	25	509
14	19:00	20:00	0	0	0
15	20:00	21:00	0	0	0
16	21:00	22:00	0	0	0

Warrant 2: Four-Hour Volume 100%

Warrant Evaluated? Yes
Warrant Satisfied? No
Manually Set To:

Hour Start	14:00	16:00	7:00	15:00
Major Road Vol.	681	644	638	625
Minor Road Vol.	30	38	28	30



Wisconsin Department of Transportation Traffic Signal Warrant Summary Worksheet

100%

The Worksheet(s) attached are provided as an attachment to the Engineering Investigation Study for:

Intersection: USH 53 NB (4th St) & Vine St
County: La Crosse
City: La Crosse

Major Street: USH 53 NB (4th St)
Critical Approach Speed: 25 mph
Lanes: 2 or more lanes

Minor Street: Vine St
Critical Approach Speed: 25 mph
Lanes: 1 lane

% Right Turns Included
From North (SB) 0%
From East (WB) 100%
From South (NB) 100%
From West (EB) 0%

In built-up area of isolated community of < 10,000 population? No
Total number of approaches at intersection? 3
If it is a "T" intersection, inflate minor threshold to 150%? No
Manually set volume level? No

Analysis based on EXISTING volume data.

Date	Day of the Week	Time (HH:MM)			
		From	AM / PM	To	AM / PM
9/29/2020	Tuesday	6:00	AM	7:00	PM

Warrant Evaluation Summary	Warrant Met:
Warrant 1: Eight - Hour Vehicular Volume	No
Condition A: Minimum Vehicular Volume	No
Condition B: Interruption of Continuous Traffic	No
Condition C: Combination: 80% of A and B	No
Warrant 2: Four-Hour Volume	No
Warrant 3: Peak Hour Volume	N/A
Warrant 4: Pedestrian Volume	N/A
Criterion A: Four-Hour	
Criterion B: Peak-Hour	
Warrant 5: School Crossing	N/A
Warrant 6: Coordinated Signal System	N/A
Warrant 7: Crash Experience	N/A
Warrant 8: Roadway Network	N/A
Warrant 9: Intersection Near a Grade Crossing	N/A

Warrant Analysis Conducted By:
Name: Jeff Sandberg
Agency: AECOM
Date: 1/7/2021

Warrant 1: Eight - Hour Vehicular Volume 100%

Warrant Evaluated? Yes Warrant Satisfied? No Manually Set To:

Condition A : Min. Veh. Volume		
Volume Level	100%	80%
Major Rd. Req	600	480
Minor Rd. Req	150	120
Number of Hours	0	0

Satisfied? No

Condition B: Interruption of Continuous Traffic		
Volume Level	100%	80%
Major Rd. Req	900	720
Minor Rd. Req	75	60
Number of Hours	0	0

Satisfied? No

Condition C: Combination of A & B at 80%

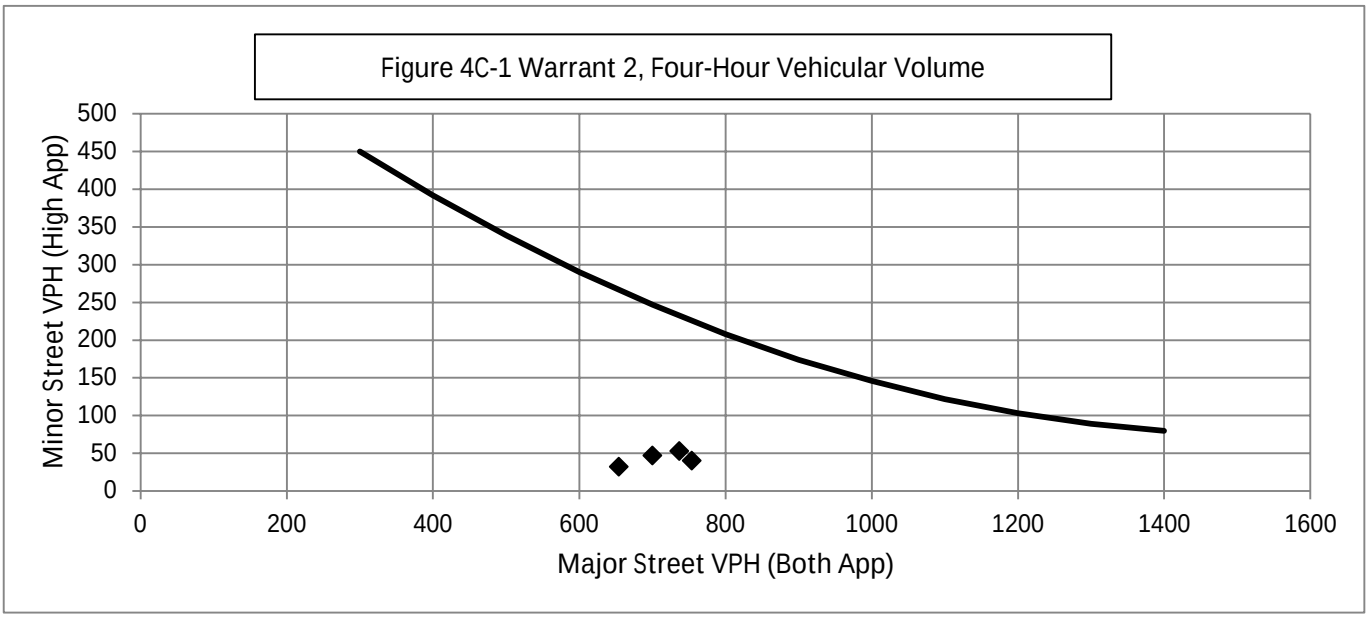
Satisfied? No

6:00 AM	Enter Start Time (Military Time) (HH:MM)				
Time Period	From	To	Major Road: Both App. (VPH)	Minor Road: High App. (VPH)	Total
1	6:00	7:00	248	27	275
2	7:00	8:00	398	34	432
3	8:00	9:00	408	40	448
4	9:00	10:00	447	30	477
5	10:00	11:00	569	34	603
6	11:00	12:00	608	30	638
7	12:00	13:00	608	35	643
8	13:00	14:00	624	35	659
9	14:00	15:00	700	47	747
10	15:00	16:00	754	40	794
11	16:00	17:00	737	53	790
12	17:00	18:00	654	32	686
13	18:00	19:00	429	27	456
14	19:00	20:00	0	0	0
15	20:00	21:00	0	0	0
16	21:00	22:00	0	0	0

Warrant 2: Four-Hour Volume 100%

Warrant Evaluated? Yes
Warrant Satisfied? No
Manually Set To:

Hour Start	16:00	15:00	14:00	17:00
Major Road Vol.	737	754	700	654
Minor Road Vol.	53	40	47	32



Wisconsin Department of Transportation Traffic Signal Warrant Summary Worksheet

100%

The Worksheet(s) attached are provided as an attachment to the Engineering Investigation Study for:

Intersection: USH 53 SB (3rd St) & King St
County: La Crosse
City: La Crosse

Major Street: USH 53 SB (3rd St)
Critical Approach Speed: 25 mph
Lanes: 2 or more lanes

Minor Street: King St
Critical Approach Speed: 25 mph
Lanes: 1 lane

% Right Turns Included
From North (SB) 100%
From East (WB) 0%
From South (NB) 0%
From West (EB) 100%

In built-up area of isolated community of < 10,000 population? No
Total number of approaches at intersection? 3
If it is a "T" intersection, inflate minor threshold to 150%? No
Manually set volume level? No

Analysis based on EXISTING volume data.

Date	Day of the Week	Time (HH:MM)			
		From	AM / PM	To	AM / PM
9/29/2020	Tuesday	6:00	AM	7:00	PM

Warrant Evaluation Summary	Warrant Met:
Warrant 1: Eight - Hour Vehicular Volume	No
Condition A: Minimum Vehicular Volume	No
Condition B: Interruption of Continuous Traffic	No
Condition C: Combination: 80% of A and B	No
Warrant 2: Four-Hour Volume	No
Warrant 3: Peak Hour Volume	N/A
Warrant 4: Pedestrian Volume	N/A
Criterion A: Four-Hour	
Criterion B: Peak-Hour	
Warrant 5: School Crossing	N/A
Warrant 6: Coordinated Signal System	N/A
Warrant 7: Crash Experience	N/A
Warrant 8: Roadway Network	N/A
Warrant 9: Intersection Near a Grade Crossing	N/A

Warrant Analysis Conducted By:
Name: Jeff Sandberg
Agency: AECOM
Date: 1/7/2021

Warrant 1: Eight - Hour Vehicular Volume 100%

Warrant Evaluated? Yes Warrant Satisfied? No Manually Set To:

Condition A : Min. Veh. Volume		
Volume Level	100%	80%
Major Rd. Req	600	480
Minor Rd. Req	150	120
Number of Hours	0	0

Satisfied? No

Condition B: Interruption of Continuous Traffic		
Volume Level	100%	80%
Major Rd. Req	900	720
Minor Rd. Req	75	60
Number of Hours	0	0

Satisfied? No

Condition C: Combination of A & B at 80%

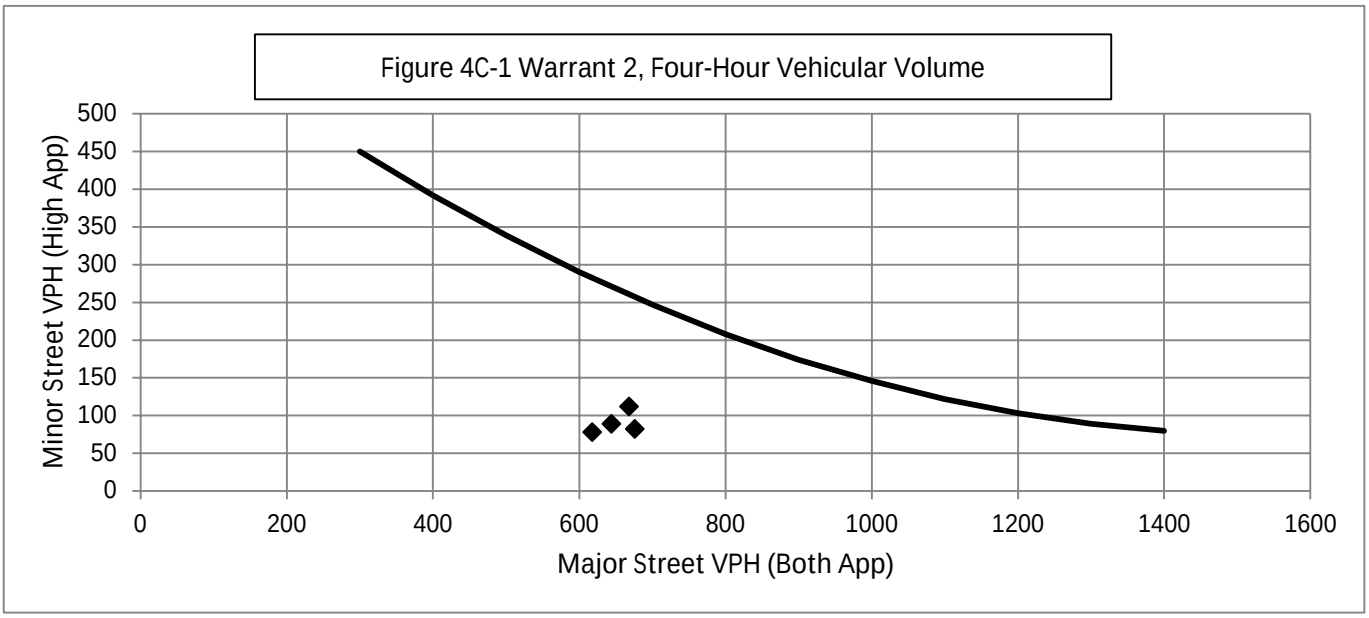
Satisfied? No

6:00 AM	Enter Start Time (Military Time) (HH:MM)				
Time Period	From	To	Major Road: Both App. (VPH)	Minor Road: High App. (VPH)	Total
1	6:00	7:00	407	21	428
2	7:00	8:00	546	29	575
3	8:00	9:00	477	34	511
4	9:00	10:00	446	42	488
5	10:00	11:00	514	39	553
6	11:00	12:00	528	52	580
7	12:00	13:00	633	52	685
8	13:00	14:00	618	51	669
9	14:00	15:00	644	89	733
10	15:00	16:00	668	112	780
11	16:00	17:00	676	82	758
12	17:00	18:00	618	78	696
13	18:00	19:00	513	47	560
14	19:00	20:00	0	0	0
15	20:00	21:00	0	0	0
16	21:00	22:00	0	0	0

Warrant 2: Four-Hour Volume 100%

Warrant Evaluated? Yes
Warrant Satisfied? No
Manually Set To:

Hour Start	15:00	16:00	14:00	17:00
Major Road Vol.	668	676	644	618
Minor Road Vol.	112	82	89	78



Wisconsin Department of Transportation Traffic Signal Warrant Summary Worksheet

100%

The Worksheet(s) attached are provided as an attachment to the Engineering Investigation Study for:

Intersection: USH 53 NB (4th St) & King St
County: La Crosse
City: La Crosse

Major Street: USH 53 NB (4th St)
Critical Approach Speed: 25 mph
Lanes: 2 or more lanes

Minor Street: King St
Critical Approach Speed: 25 mph
Lanes: 1 lane

% Right Turns Included
From North (SB) 0%
From East (WB) 100%
From South (NB) 100%
From West (EB) 0%

In built-up area of isolated community of < 10,000 population? No
Total number of approaches at intersection? 3
If it is a "T" intersection, inflate minor threshold to 150%? No
Manually set volume level? No

Analysis based on EXISTING volume data.

Date	Day of the Week	Time (HH:MM)			
		From	AM / PM	To	AM / PM
9/29/2020	Tuesday	6:00	AM	7:00	PM

Warrant Evaluation Summary	Warrant Met:
Warrant 1: Eight - Hour Vehicular Volume	No
Condition A: Minimum Vehicular Volume	No
Condition B: Interruption of Continuous Traffic	No
Condition C: Combination: 80% of A and B	No
Warrant 2: Four-Hour Volume	No
Warrant 3: Peak Hour Volume	N/A
Warrant 4: Pedestrian Volume	N/A
Criterion A: Four-Hour	
Criterion B: Peak-Hour	
Warrant 5: School Crossing	N/A
Warrant 6: Coordinated Signal System	N/A
Warrant 7: Crash Experience	N/A
Warrant 8: Roadway Network	N/A
Warrant 9: Intersection Near a Grade Crossing	N/A

Warrant Analysis Conducted By:
Name: Jeff Sandberg
Agency: AECOM
Date: 1/7/2021

Warrant 1: Eight - Hour Vehicular Volume 100%

Warrant Evaluated? Yes Warrant Satisfied? No Manually Set To:

Condition A : Min. Veh. Volume		
Volume Level	100%	80%
Major Rd. Req	600	480
Minor Rd. Req	150	120
Number of Hours	0	0

Satisfied? No

Condition B: Interruption of Continuous Traffic		
Volume Level	100%	80%
Major Rd. Req	900	720
Minor Rd. Req	75	60
Number of Hours	0	1

Satisfied? No

Condition C: Combination of A & B at 80%

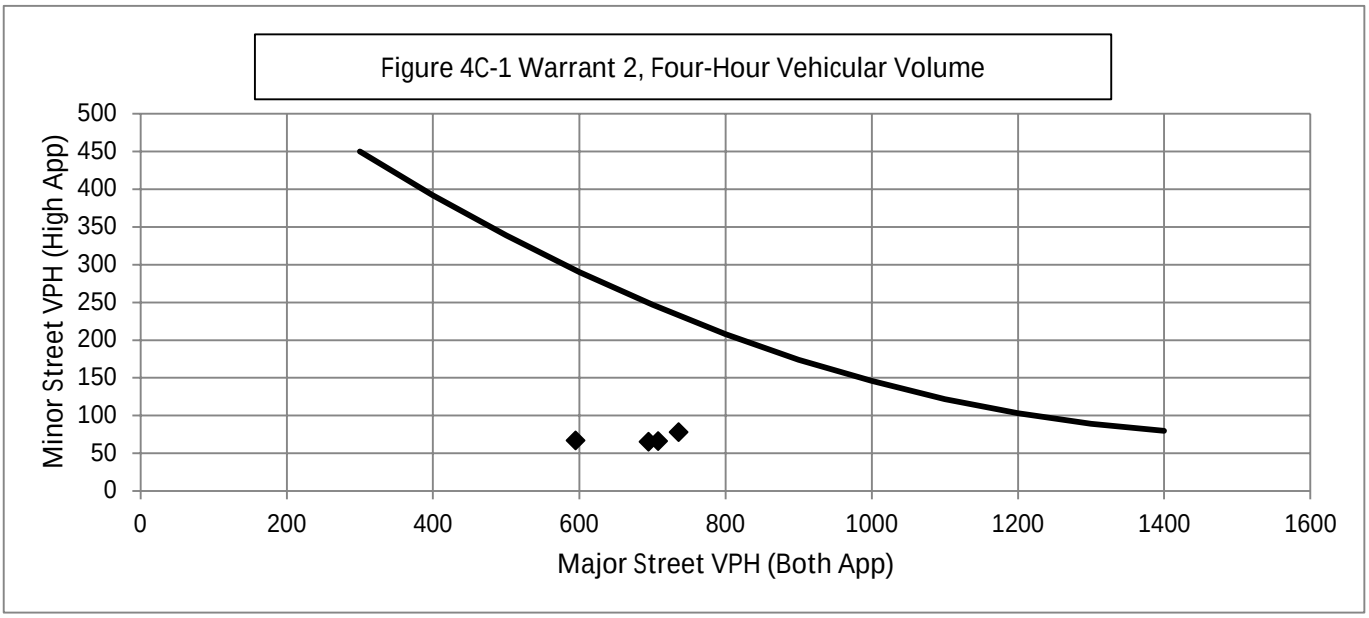
Satisfied? No

6:00 AM	Enter Start Time (Military Time) (HH:MM)				
Time Period	From	To	Major Road: Both App. (VPH)	Minor Road: High App. (VPH)	Total
1	6:00	7:00	278	12	290
2	7:00	8:00	470	26	496
3	8:00	9:00	456	31	487
4	9:00	10:00	476	45	521
5	10:00	11:00	562	45	607
6	11:00	12:00	596	65	661
7	12:00	13:00	595	67	662
8	13:00	14:00	590	58	648
9	14:00	15:00	695	65	760
10	15:00	16:00	736	78	814
11	16:00	17:00	708	66	774
12	17:00	18:00	600	58	658
13	18:00	19:00	412	52	464
14	19:00	20:00	0	0	0
15	20:00	21:00	0	0	0
16	21:00	22:00	0	0	0

Warrant 2: Four-Hour Volume 100%

Warrant Evaluated? Yes
Warrant Satisfied? No
Manually Set To:

Hour Start	15:00	16:00	14:00	12:00
Major Road Vol.	736	708	695	595
Minor Road Vol.	78	66	65	67



Wisconsin Department of Transportation Traffic Signal Warrant Summary Worksheet

100%

The Worksheet(s) attached are provided as an attachment to the Engineering Investigation Study for:

Intersection: USH 14 SB (3rd St) & Market St
County: La Crosse
City: La Crosse

Major Street: USH 14 SB (3rd St)
Critical Approach Speed: 25 mph
Lanes: 2 or more lanes

Minor Street: Market St
Critical Approach Speed: 25 mph
Lanes: 1 lane

% Right Turns Included
From North (SB) 100%
From East (WB) 0%
From South (NB) 0%
From West (EB) 100%

In built-up area of isolated community of < 10,000 population? No
Total number of approaches at intersection? 3
If it is a "T" intersection, inflate minor threshold to 150%? No
Manually set volume level? No

Analysis based on EXISTING volume data.

Date	Day of the Week	Time (HH:MM)			
		From	AM / PM	To	AM / PM
9/29/2020	Tuesday	6:00	AM	7:00	PM

Warrant Evaluation Summary	Warrant Met:
Warrant 1: Eight - Hour Vehicular Volume	No
Condition A: Minimum Vehicular Volume	No
Condition B: Interruption of Continuous Traffic	No
Condition C: Combination: 80% of A and B	No
Warrant 2: Four-Hour Volume	No
Warrant 3: Peak Hour Volume	N/A
Warrant 4: Pedestrian Volume	N/A
Criterion A: Four-Hour	
Criterion B: Peak-Hour	
Warrant 5: School Crossing	N/A
Warrant 6: Coordinated Signal System	N/A
Warrant 7: Crash Experience	N/A
Warrant 8: Roadway Network	N/A
Warrant 9: Intersection Near a Grade Crossing	N/A

Warrant Analysis Conducted By:
Name: Jeff Sandberg
Agency: AECOM
Date: 1/7/2021

Warrant 1: Eight - Hour Vehicular Volume 100%

Warrant Evaluated? Yes Warrant Satisfied? No Manually Set To:

Condition A : Min. Veh. Volume		
Volume Level	100%	80%
Major Rd. Req	600	480
Minor Rd. Req	150	120
Number of Hours	0	0

Satisfied? No

Condition B: Interruption of Continuous Traffic		
Volume Level	100%	80%
Major Rd. Req	900	720
Minor Rd. Req	75	60
Number of Hours	0	0

Satisfied? No

Condition C: Combination of A & B at 80%

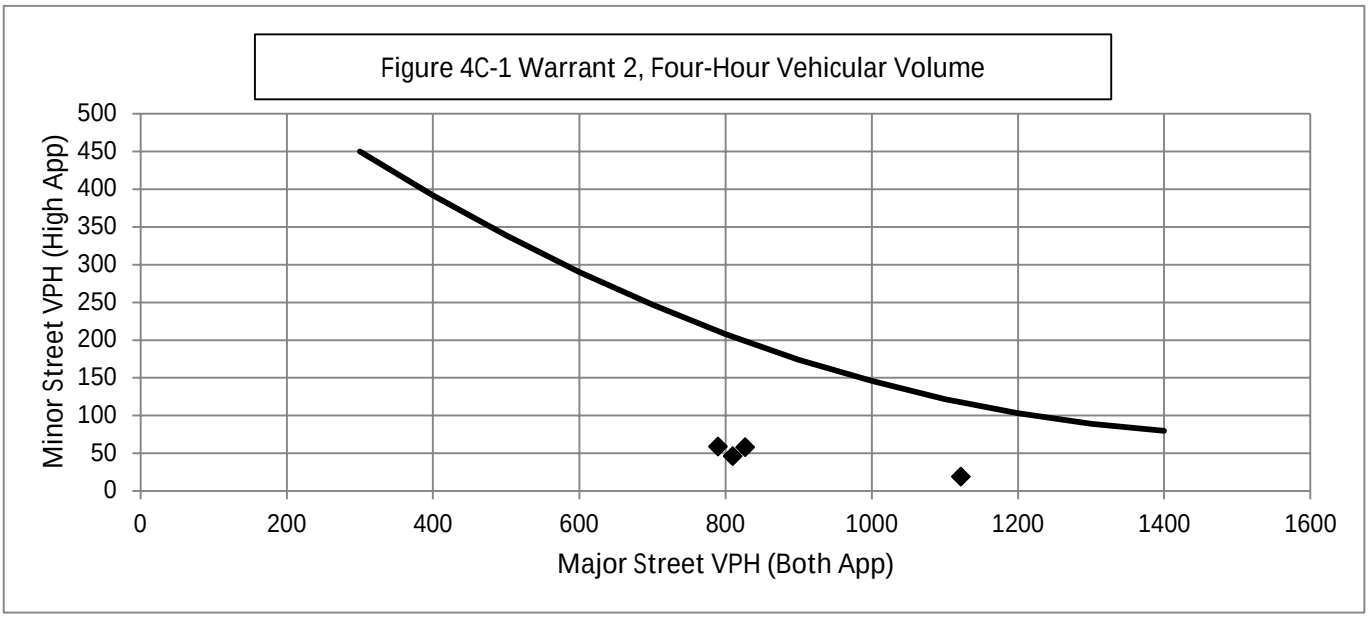
Satisfied? No

6:00 AM	Enter Start Time (Military Time) (HH:MM)				
Time Period	From	To	Major Road: Both App. (VPH)	Minor Road: High App. (VPH)	Total
1	6:00	7:00	780	17	797
2	7:00	8:00	1122	19	1141
3	8:00	9:00	751	15	766
4	9:00	10:00	656	39	695
5	10:00	11:00	677	29	706
6	11:00	12:00	648	36	684
7	12:00	13:00	776	51	827
8	13:00	14:00	778	40	818
9	14:00	15:00	790	59	849
10	15:00	16:00	810	46	856
11	16:00	17:00	827	58	885
12	17:00	18:00	755	37	792
13	18:00	19:00	583	26	609
14	19:00	20:00	0	0	0
15	20:00	21:00	0	0	0
16	21:00	22:00	0	0	0

Warrant 2: Four-Hour Volume 100%

Warrant Evaluated? Yes
Warrant Satisfied? No
Manually Set To:

Hour Start	7:00	16:00	14:00	15:00
Major Road Vol.	1122	827	790	810
Minor Road Vol.	19	58	59	46



Wisconsin Department of Transportation Traffic Signal Warrant Summary Worksheet

100%

The Worksheet(s) attached are provided as an attachment to the Engineering Investigation Study for:

Intersection: USH 14 NB (4th St) & Market St
County: La Crosse
City: La Crosse

Major Street: USH 14 NB (4th St)
Critical Approach Speed: 25 mph
Lanes: 2 or more lanes

Minor Street: Market St
Critical Approach Speed: 25 mph
Lanes: 1 lane

% Right Turns Included
From North (SB) 0%
From East (WB) 100%
From South (NB) 100%
From West (EB) 0%

In built-up area of isolated community of < 10,000 population? No
Total number of approaches at intersection? 3
If it is a "T" intersection, inflate minor threshold to 150%? No
Manually set volume level? No

Analysis based on EXISTING volume data.

Date	Day of the Week	Time (HH:MM)			
		From	AM / PM	To	AM / PM
9/29/2020	Tuesday	6:00	AM	7:00	PM

Warrant Evaluation Summary	Warrant Met:
Warrant 1: Eight - Hour Vehicular Volume	No
Condition A: Minimum Vehicular Volume	No
Condition B: Interruption of Continuous Traffic	No
Condition C: Combination: 80% of A and B	No
Warrant 2: Four-Hour Volume	No
Warrant 3: Peak Hour Volume	N/A
Warrant 4: Pedestrian Volume	N/A
Criterion A: Four-Hour	
Criterion B: Peak-Hour	
Warrant 5: School Crossing	N/A
Warrant 6: Coordinated Signal System	N/A
Warrant 7: Crash Experience	N/A
Warrant 8: Roadway Network	N/A
Warrant 9: Intersection Near a Grade Crossing	N/A

Warrant Analysis Conducted By:
Name: Jeff Sandberg
Agency: AECOM
Date: 1/7/2021

Warrant 1: Eight - Hour Vehicular Volume 100%

Warrant Evaluated? Yes Warrant Satisfied? No Manually Set To:

Condition A : Min. Veh. Volume		
Volume Level	100%	80%
Major Rd. Req	600	480
Minor Rd. Req	150	120
Number of Hours	0	0

Satisfied? No

Condition B: Interruption of Continuous Traffic		
Volume Level	100%	80%
Major Rd. Req	900	720
Minor Rd. Req	75	60
Number of Hours	2	5

Satisfied? No

Condition C: Combination of A & B at 80%

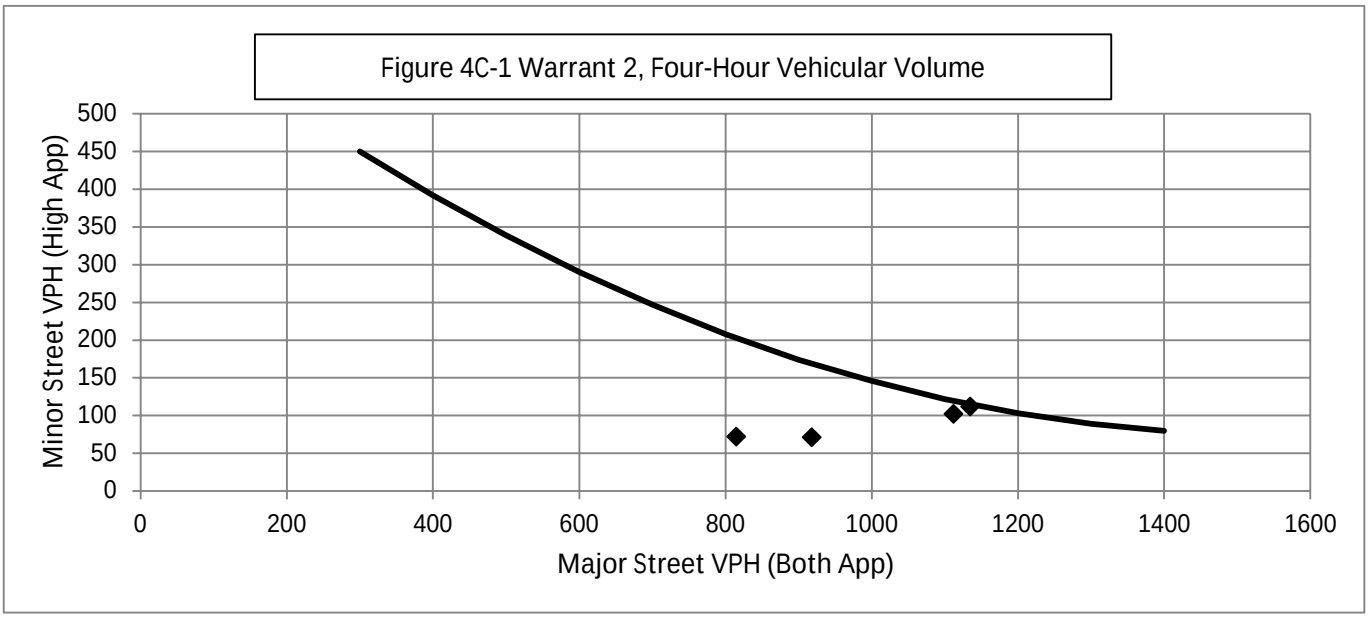
Satisfied? No

6:00 AM	Enter Start Time (Military Time) (HH:MM)				
Time Period	From	To	Major Road: Both App. (VPH)	Minor Road: High App. (VPH)	Total
1	6:00	7:00	394	25	419
2	7:00	8:00	577	54	631
3	8:00	9:00	522	34	556
4	9:00	10:00	560	58	618
5	10:00	11:00	638	55	693
6	11:00	12:00	714	69	783
7	12:00	13:00	706	74	780
8	13:00	14:00	751	70	821
9	14:00	15:00	918	71	989
10	15:00	16:00	1112	102	1214
11	16:00	17:00	1135	112	1247
12	17:00	18:00	815	72	887
13	18:00	19:00	477	49	526
14	19:00	20:00	0	0	0
15	20:00	21:00	0	0	0
16	21:00	22:00	0	0	0

Warrant 2: Four-Hour Volume 100%

Warrant Evaluated? Yes
Warrant Satisfied? No
Manually Set To:

Hour Start	16:00	15:00	14:00	17:00
Major Road Vol.	1135	1112	918	815
Minor Road Vol.	112	102	71	72



Wisconsin Department of Transportation Traffic Signal Warrant Summary Worksheet

100%

The Worksheet(s) attached are provided as an attachment to the Engineering Investigation Study for:

Intersection: Losey Blvd & Farnam St
County: La Crosse
City: La Crosse

Major Street: Losey Blvd
Critical Approach Speed: 25 mph
Lanes: 2 or more lanes

Minor Street: Farnam St
Critical Approach Speed: 25 mph
Lanes: 1 lane

% Right Turns Included
From North (SB) 0%
From East (WB) 0%
From South (NB) 100%
From West (EB) 0%

In built-up area of isolated community of < 10,000 population? No
Total number of approaches at intersection? 3
If it is a "T" intersection, inflate minor threshold to 150%? No
Manually set volume level? No

Analysis based on EXISTING volume data.

Date	Day of the Week	Time (HH:MM)			
		From	AM / PM	To	AM / PM
9/29/2020	Tuesday	6:00	AM	7:00	PM

Warrant Evaluation Summary	Warrant Met:
Warrant 1: Eight - Hour Vehicular Volume	No
Condition A: Minimum Vehicular Volume	No
Condition B: Interruption of Continuous Traffic	No
Condition C: Combination: 80% of A and B	No
Warrant 2: Four-Hour Volume	No
Warrant 3: Peak Hour Volume	N/A
Warrant 4: Pedestrian Volume	N/A
Criterion A: Four-Hour	
Criterion B: Peak-Hour	
Warrant 5: School Crossing	N/A
Warrant 6: Coordinated Signal System	N/A
Warrant 7: Crash Experience	N/A
Warrant 8: Roadway Network	N/A
Warrant 9: Intersection Near a Grade Crossing	N/A

Warrant Analysis Conducted By:
Name: Jeff Sandberg
Agency: AECOM
Date: 1/7/2021

Warrant 1: Eight - Hour Vehicular Volume 100%

Warrant Evaluated? Yes

Warrant Satisfied? No

Manually Set To:

Condition A : Min. Veh. Volume		
Volume Level	100%	80%
Major Rd. Req	600	480
Minor Rd. Req	150	120
Number of Hours	0	0

Satisfied? No

Condition B: Interruption of Continuous Traffic		
Volume Level	100%	80%
Major Rd. Req	900	720
Minor Rd. Req	75	60
Number of Hours	0	0

Satisfied? No

Condition C: Combination of A & B at 80%

Satisfied? No

6:00 AM	Enter Start Time (Military Time) (HH:MM)				
Time Period	From	To	Major Road: Both App. (VPH)	Minor Road: High App. (VPH)	Total
1	6:00	7:00	1179	6	1185
2	7:00	8:00	1822	11	1833
3	8:00	9:00	1461	8	1469
4	9:00	10:00	1286	5	1291
5	10:00	11:00	1440	6	1446
6	11:00	12:00	1661	11	1672
7	12:00	13:00	1787	10	1797
8	13:00	14:00	1817	10	1827
9	14:00	15:00	1942	9	1951
10	15:00	16:00	2159	6	2165
11	16:00	17:00	2329	11	2340
12	17:00	18:00	2110	7	2117
13	18:00	19:00	1591	7	1598
14	19:00	20:00	0	0	0
15	20:00	21:00	0	0	0
16	21:00	22:00	0	0	0

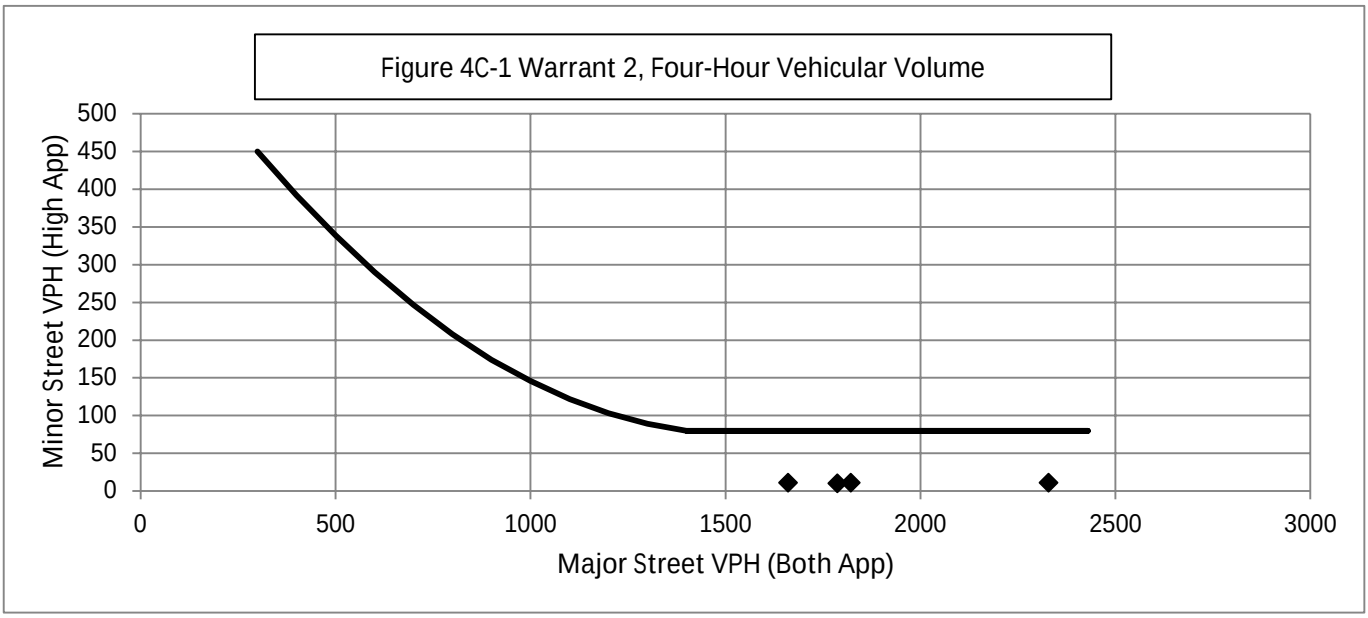
Warrant 2: Four-Hour Volume 100%

Warrant Evaluated? Yes

Warrant Satisfied? No

Manually Set To:

Hour Start	7:00	11:00	16:00	12:00
Major Road Vol.	1822	1661	2329	1787
Minor Road Vol.	11	11	11	10



Wisconsin Department of Transportation Traffic Signal Warrant Summary Worksheet

100%

The Worksheet(s) attached are provided as an attachment to the Engineering Investigation Study for:

Intersection: Losey Blvd & Weston St
County: La Crosse
City: La Crosse

Major Street: Losey Blvd
Critical Approach Speed: 25 mph
Lanes: 2 or more lanes

Minor Street: Weston St
Critical Approach Speed: 25 mph
Lanes: 1 lane

% Right Turns Included
From North (SB) 100%
From East (WB) 100%
From South (NB) 100%
From West (EB) 100%

In built-up area of isolated community of < 10,000 population? No
Total number of approaches at intersection? 4 or more
If it is a "T" intersection, inflate minor threshold to 150%? No
Manually set volume level? No

Analysis based on EXISTING volume data.

Date	Day of the Week	Time (HH:MM)			
		From	AM / PM	To	AM / PM
9/29/2020	Tuesday	6:00	AM	7:00	PM

Warrant Evaluation Summary	Warrant Met:
Warrant 1: Eight - Hour Vehicular Volume	No
Condition A: Minimum Vehicular Volume	No
Condition B: Interruption of Continuous Traffic	No
Condition C: Combination: 80% of A and B	No
Warrant 2: Four-Hour Volume	No
Warrant 3: Peak Hour Volume	N/A
Warrant 4: Pedestrian Volume	N/A
Criterion A: Four-Hour	
Criterion B: Peak-Hour	
Warrant 5: School Crossing	N/A
Warrant 6: Coordinated Signal System	N/A
Warrant 7: Crash Experience	N/A
Warrant 8: Roadway Network	N/A
Warrant 9: Intersection Near a Grade Crossing	N/A

Warrant Analysis Conducted By:
Name: Jeff Sandberg
Agency: AECOM
Date: 1/7/2021

Warrant 1: Eight - Hour Vehicular Volume 100%

Warrant Evaluated? Yes Warrant Satisfied? No Manually Set To:

Condition A : Min. Veh. Volume		
Volume Level	100%	80%
Major Rd. Req	600	480
Minor Rd. Req	150	120
Number of Hours	0	0

Satisfied? No

Condition B: Interruption of Continuous Traffic		
Volume Level	100%	80%
Major Rd. Req	900	720
Minor Rd. Req	75	60
Number of Hours	0	1

Satisfied? No

Condition C: Combination of A & B at 80%

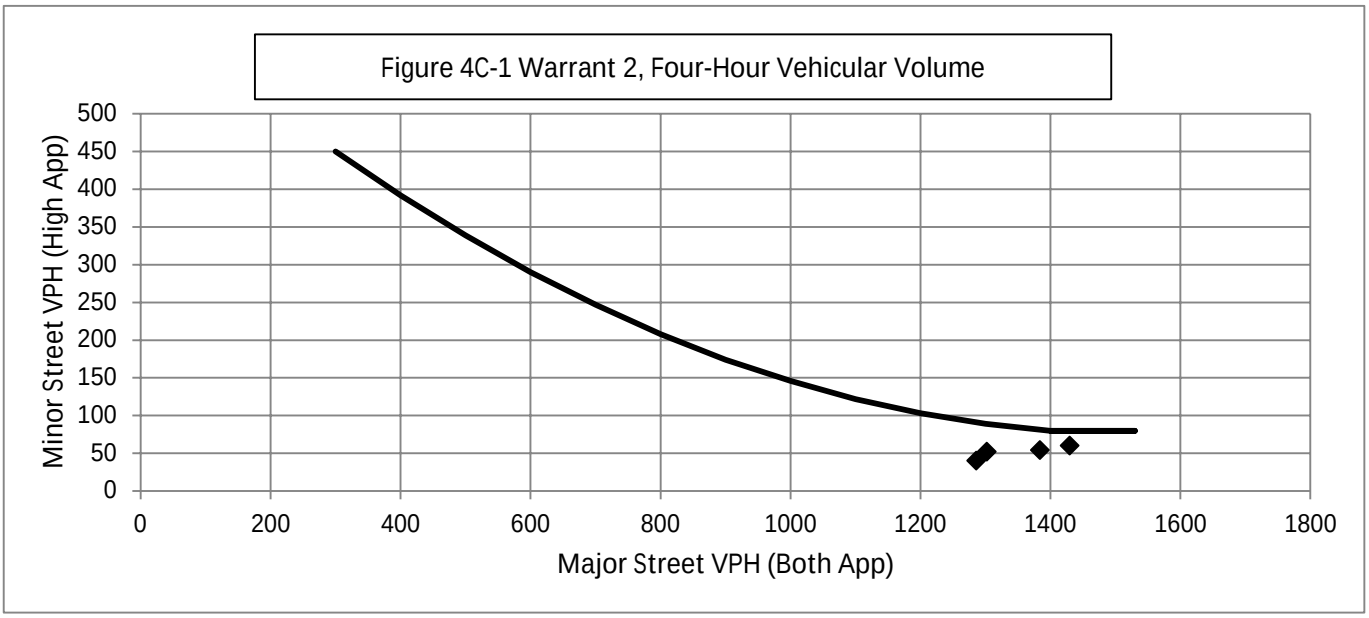
Satisfied? No

6:00 AM	Enter Start Time (Military Time) (HH:MM)				
Time Period	From	To	Major Road: Both App. (VPH)	Minor Road: High App. (VPH)	Total
1	6:00	7:00	657	22	679
2	7:00	8:00	980	32	1012
3	8:00	9:00	818	38	856
4	9:00	10:00	774	30	804
5	10:00	11:00	921	42	963
6	11:00	12:00	1081	48	1129
7	12:00	13:00	1189	52	1241
8	13:00	14:00	1142	27	1169
9	14:00	15:00	1286	40	1326
10	15:00	16:00	1384	54	1438
11	16:00	17:00	1430	60	1490
12	17:00	18:00	1302	52	1354
13	18:00	19:00	941	25	966
14	19:00	20:00	0	0	0
15	20:00	21:00	0	0	0
16	21:00	22:00	0	0	0

Warrant 2: Four-Hour Volume 100%

Warrant Evaluated? Yes
Warrant Satisfied? No
Manually Set To:

Hour Start	16:00	15:00	17:00	14:00
Major Road Vol.	1430	1384	1302	1286
Minor Road Vol.	60	54	52	40



Appendix 6: Existing Conditions O-D Study

AECOM
1350 Deming Way
Middleton, WI 53562
aecom.com

Project name:
La Crosse Safety & Operations Study

Project ref:
1630-08-00

To:
Josh Koebernick, WisDOT
Ruchi Datta, WisDOT

CC:
Rich Cannon, WisDOT
Andy Winga, WisDOT
Michael Hoelker, WisDOT

From:
James Jeninga

Date:
January 28, 2021

Memo

Subject: Existing Conditions O-D Study

AECOM is working with the Wisconsin Department of Transportation (WisDOT) Southwest Region to complete a Safety & Operations Study of major north-south roadways in the City of La Crosse, WI. This study includes an origin-destination analysis. This study encompasses the city limits of the City of La Crosse and examines travel patterns on the major north-south roads (US 53, US 14, WIS 16, WIS 35, and Losey Blvd) within those limits.

Travel Pattern Methodology

An origin-destination (O-D) study was performed for the existing conditions of the La Crosse study area using StreetLight Data[1]. StreetLight derives O-D information aggregated from cell phone location-based services and GPS devices. StreetLight output is mainly dependent on the input assumptions regarding location of O-D zones, time period (specific months and years), day type (weekday/weekend), time of day, and travel mode. For this analysis, the months of March, April, September, and October of 2019 were used because these months represent the most typical traffic unaffected by winter weather, summer recreational traffic, or COVID-related traffic impacts. Origin and destination zones were placed to cover the study area and all major routes in and out of the study area. O-D zones are in Figure 1.

[1] https://www.streetlightdata.com

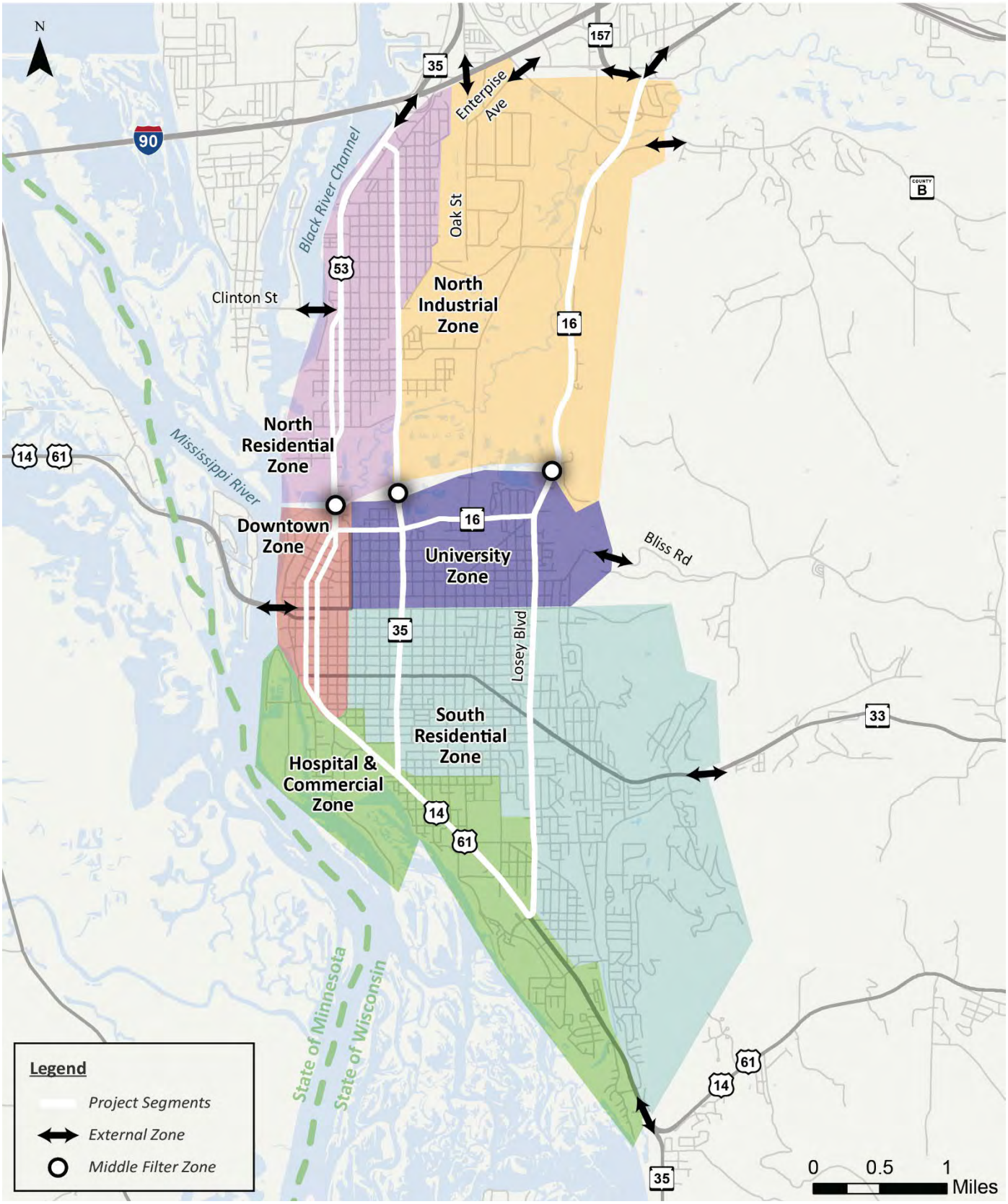


Figure 1 - O-D Zone Map

Three types of zones were laid out for the O-D effort:

1. Internal Zones: Six “non-pass through” zones, referred to as internal zones, cover the major origins and destinations within the study area. A non-pass through zone measures all of the trips that start or stop within the zone. These can be thought of as parking lots where vehicles leave from or arrive at. These zones usually cover larger areas that include homes or businesses where drivers may start and end their trips.

2. External Zones: 11 “pass through” zones, referred to as external zones, cover all major routes in and out of the study area. A pass through zone is a designated area where the trips going through the zone is measured instead of trips that start or stop in the zone. These can be thought of as gates or traditional tube counters that measure each vehicle that passes through. External zones usually stretch across a roadway.

3. Middle Filter Zones: Three pass through zones, referred to as middle filter zones, are located on the three connector routes that bridge the southern and northern sections of the study area, which is naturally divided by the La Crosse River. These three connecting routes are US 53, WIS 35, and WIS 16. Middle filter zones serve to identify the routing of trips that pass through them. Middle filter zones measure traffic between two other zones that passes through a specific location. They link an origin to a destination by only counting the trips that have passed through on their way from the origin to the destination.

StreetLight outputs an estimated number of trips between an origin and a destination for the given time period. For the months selected for analysis, StreetLight provided estimates of the average traffic for each weekday and hour for those months. This estimation was calibrated using WisDOT Automated Traffic Recorders (ATR), traffic data collection sites that continually collect traffic information such as volume and speed. The four ATR calibration locations used are on US 14 between 33rd St and Marion Rd (326114), US 14 on Barron Island (326117), US 53 between Grove St and the La Crosse River (326118), and WI 16 north of Bluff Pass (326119). This calibration allowed for more accurate trip estimations by StreetLight.

Travel Pattern Results

The La Crosse study area is a destination for both local trips originating within the city and regional trips originating outside the study area. For the purposes of this O-D Study, four types of trips were considered:

1. External-External (EE) trips: EE trips are trips that pass all the way through La Crosse, traveling from one external zone to another external zone, but do not end within the study area.
2. External-Interal (EI) trips: EI trips are trips that begin outside the study area and end within the study area.
3. Internal-External (IE) trips: IE trips are trips that begin within the study area and then exit through an external zone.
4. Internal-Internal (II) Trips: II Trips are trips that begin and end within an internal zone.

A chart showing the breakdown of trip types for an average day is in Figure 2.

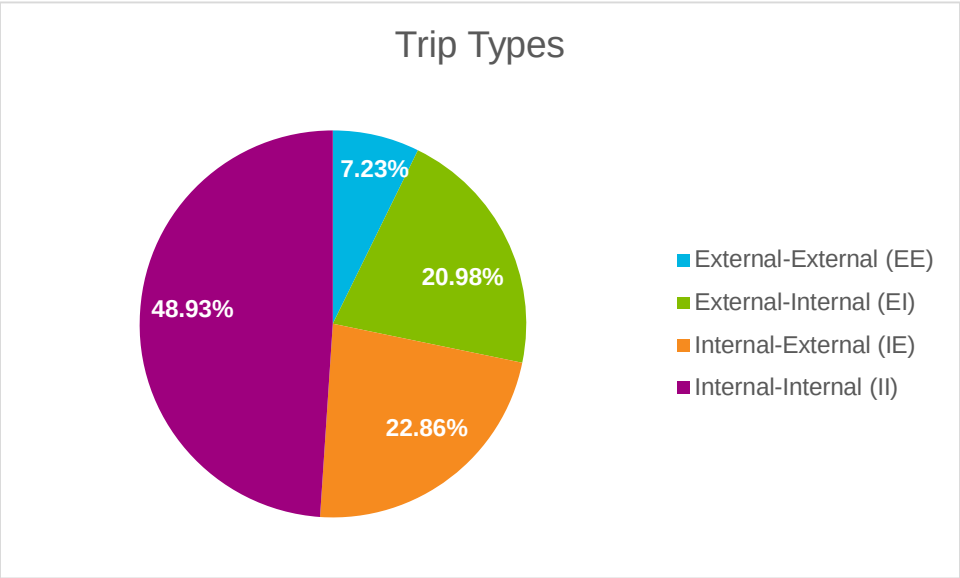


Figure 2 - Average Day Trip Types

La Crosse is also a commuter destination. This is evidenced by 38% of AM peak hour trips are EI trips, while 13% of trips are IE trips. In the PM peak hour, this trend is reversed, with 15% of trips being EI trips, while 31% of trips are IE trips. During both of these peaks, the II and EE trips peak, but don't show a strong directional trend. This peaking behavior is in Figure 3.

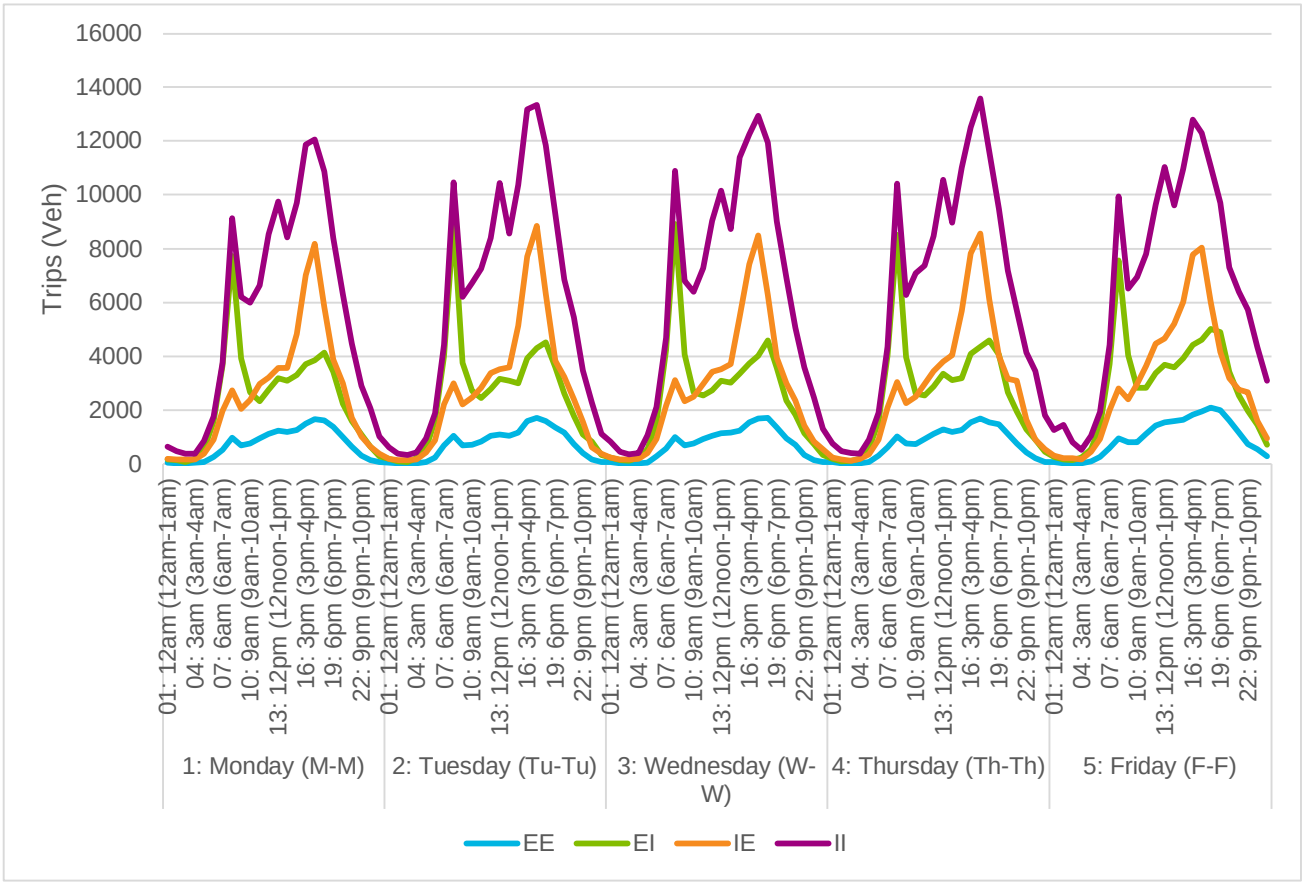


Figure 3 - Average Weekday Volumes by Hour and Day

While II trips have three distinct peaks (AM, midday, PM), EI trips have only an AM peak and lE trips have only a PM peak. EE trips do not show strong peaking behavior, which suggests that this may be through truck traffic or non-commuter traffic. The largest EE connecting route is within the WIS 157 and WIS 16 intersection with traffic going from southbound WIS 157 to northbound WIS 16.

The external zones with the largest traffic volumes are the two zones located on the north end of the study area near the intersection of WI 157 and WI 16. These zones comprise much of the commuter traffic entering La Crosse using WIS 16. The destination of traffic passing through these zones is in Figure 4.

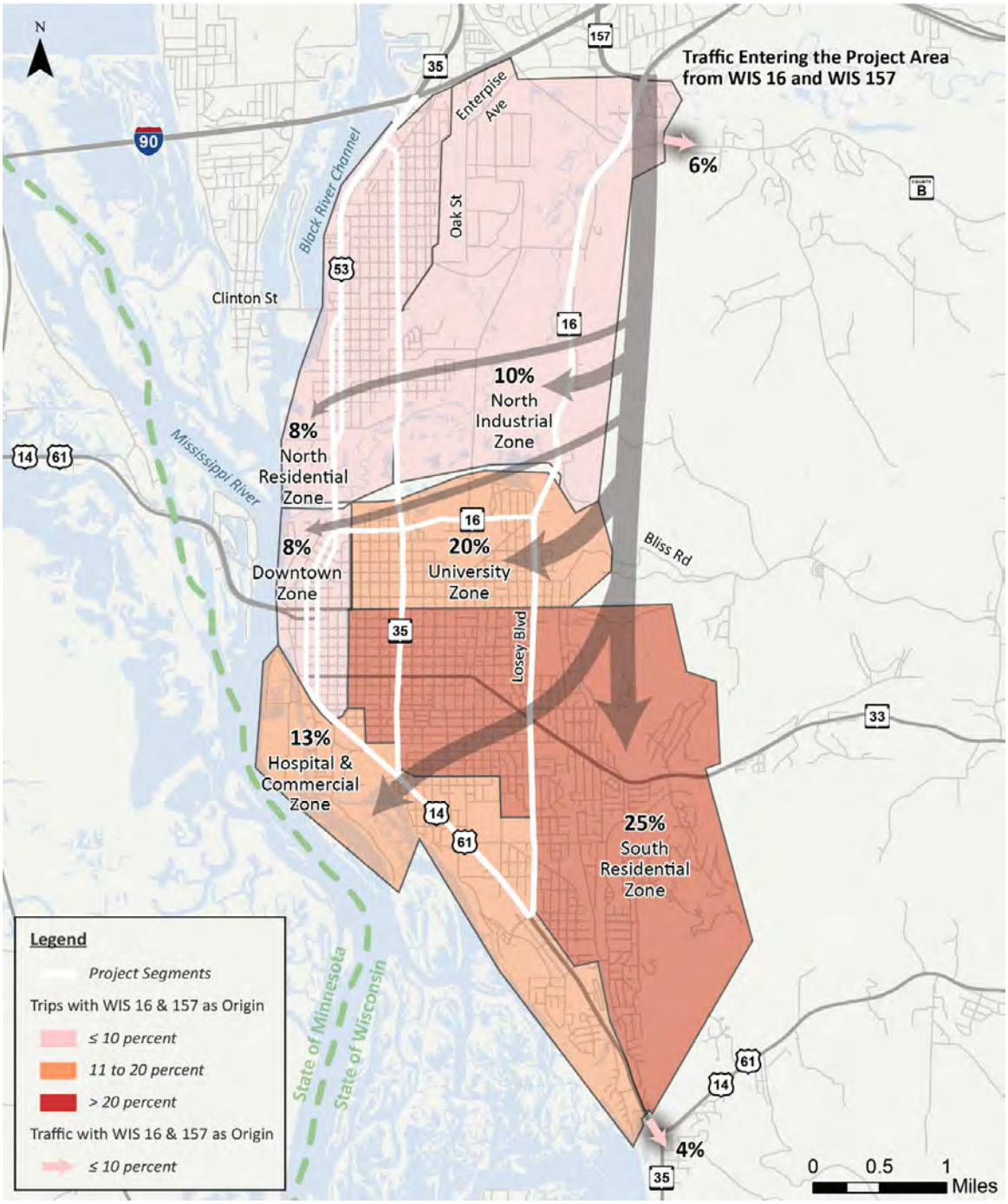


Figure 4 WIS 16 and WIS 157 Traffic Destinations

The majority of traffic entering the City near the WIS 16 & WIS 157 intersection is destined for the University zone, South Residential zone, and the Hospital & Commercial zone. This along with the limited access from WIS 16 to the North Industrial Zone and North Residential zone makes WIS 16 the most direct corridor to travel from I-90 down into the South Residential and University Zones.

The other main route for traffic entering the city from north of the study area is US 53. This route carries a lot of commuter traffic heading towards the Downtown and North Residential zones. The destination of traffic entering the City on US 53 is in Figure **5**.

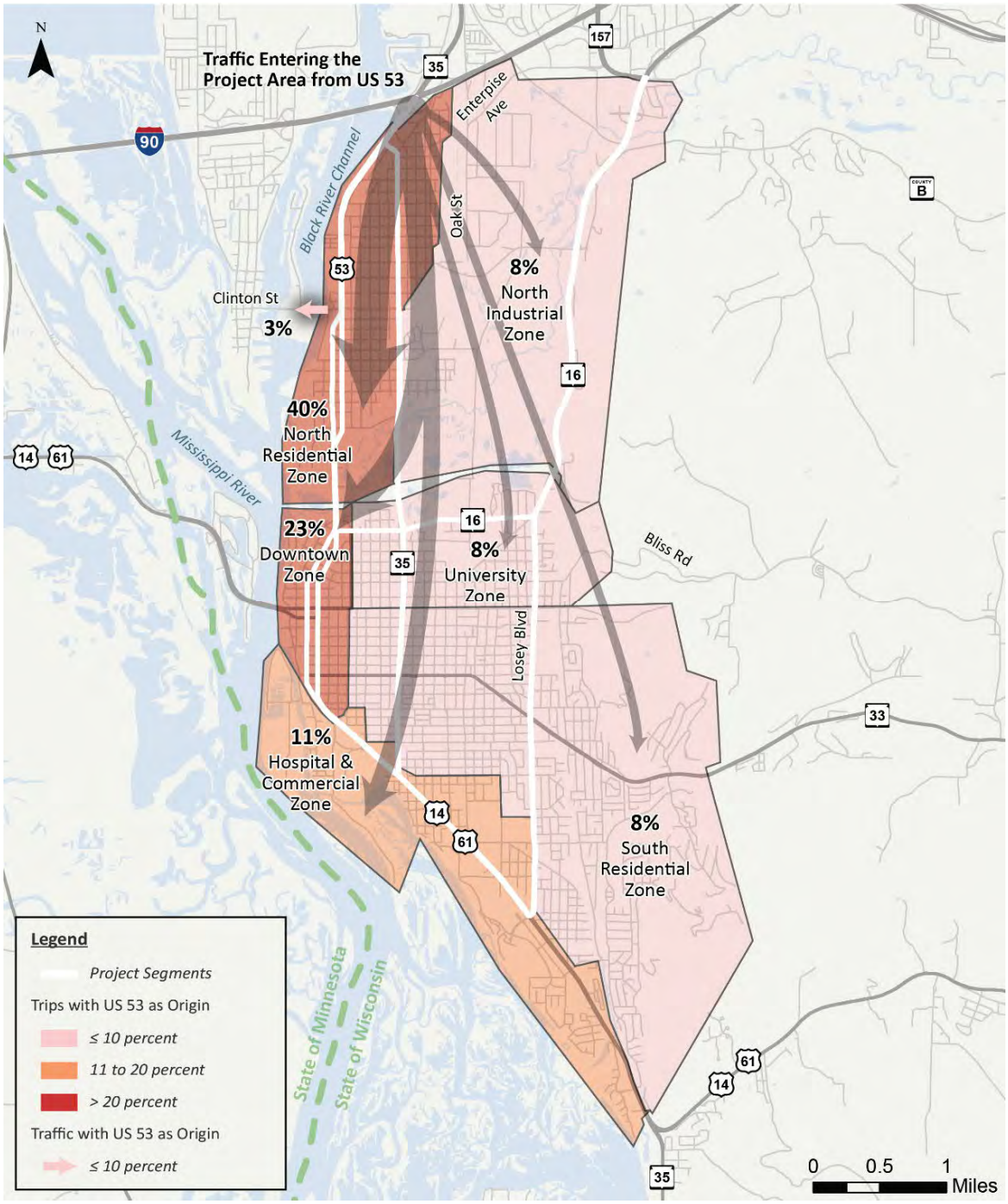


Figure 5 US 53 Traffic Destinations

Middle Filter Analysis

The La Crosse Study area is naturally divided by the La Crosse River separating the northern section of the study area from the southern section. Middle filter zones were placed on the only three connection routes across the La Crosse River to evaluate traffic patterns across the river. These middle filters are useful in identifying which of the three routes are used most often and what time of day they are used.

During the AM Peak (7:00 AM to 8:00 AM Monday, Tuesday, Wednesday, and Thursday) the majority of traffic passing through the middle filters travels from the northern section of the study area to the southern section. This is logical considering the large amount of business and employment destinations in the southern section of the study area. A breakdown of these trips is in Figure 6.

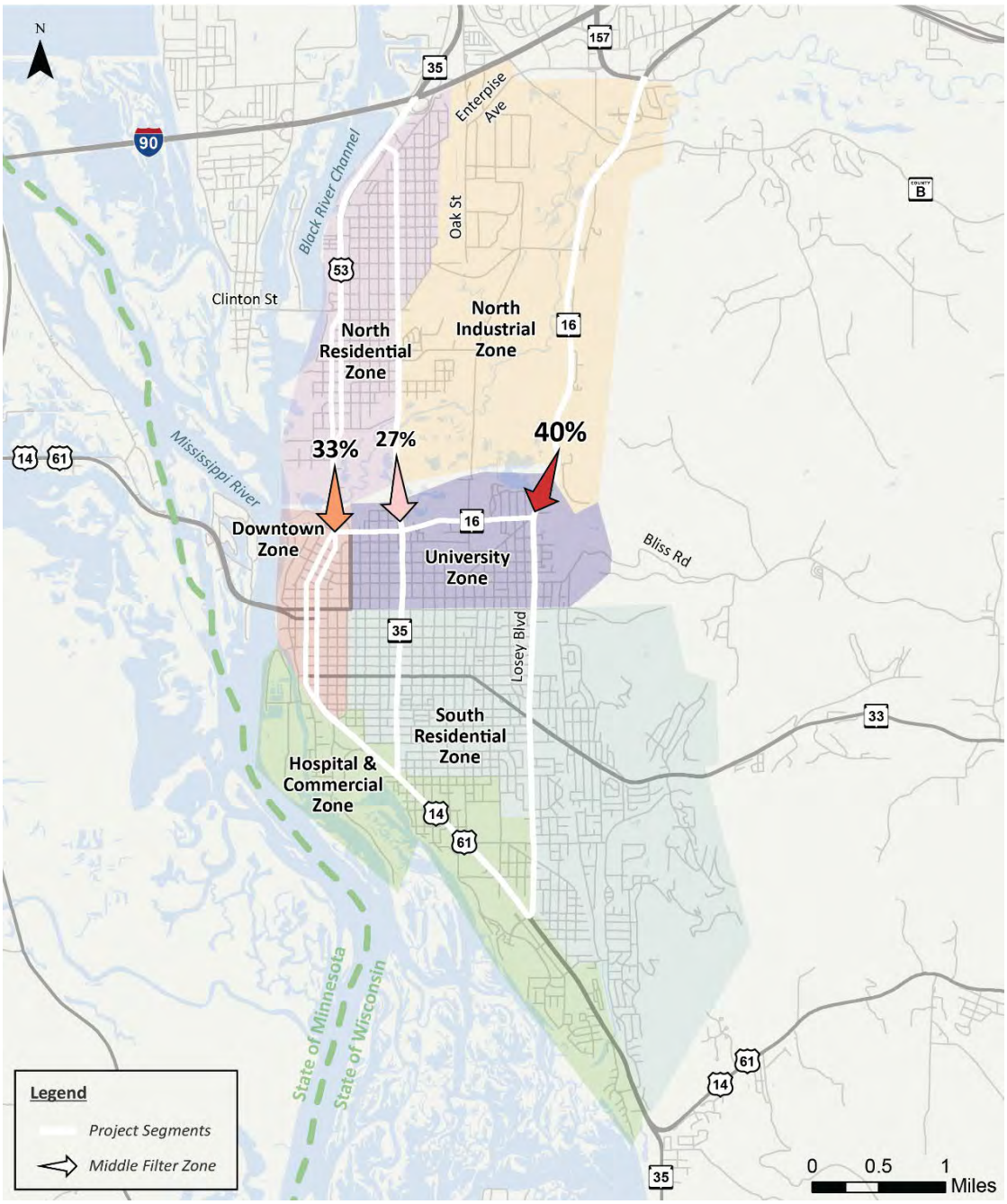


Figure 6 AM Southbound Peak Traffic Distribution between Middle Filter Zones

The most common destinations of AM peak traffic that pass through these middle filters include:

- US 53 Middle Filter: Downtown Zone, Hospital & Commercial Zone
- WIS 35 Middle Filter: University Zone, South Residential Zone
- WIS 16 Middle Filter: University Zone, South Residential Zone

In the PM peak hour, the trends reverse and the majority of traffic traveling through the middle filters is traveling from the southern section of the study area to the northern section. A breakdown of these trips is in Figure 7.

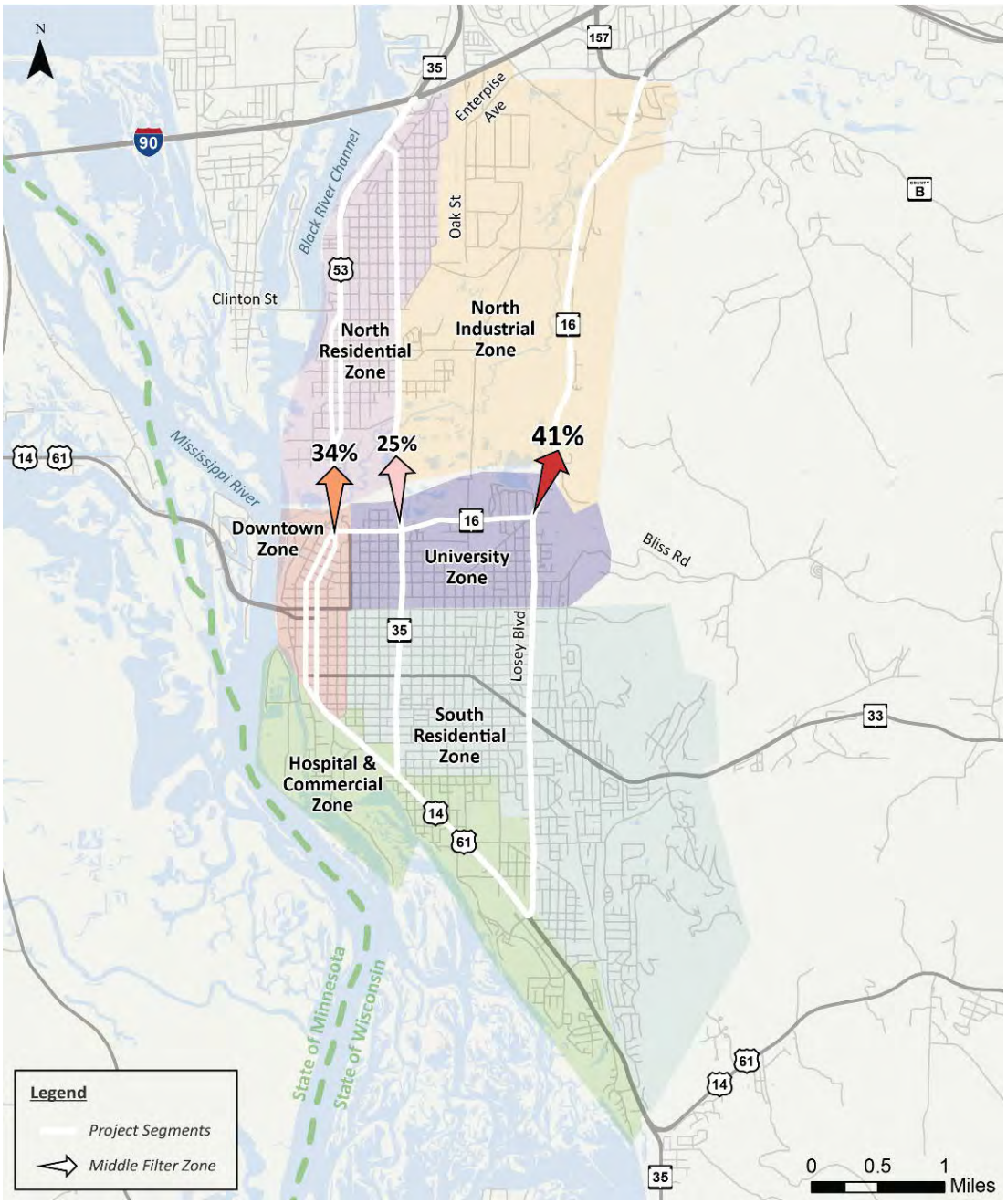


Figure 7 NB PM Peak Middle Filter Distribution

The most common destinations of PM peak traffic that pass through these middle filters include:

- US 53 Middle Filter: US 53 near I-90, North Residential Zone
- WIS 35 Middle Filter: North Residential Zone, US 53 near I-90
- WIS 16 Middle Filter: WIS 157, WIS 16 north of WIS 157

88% of WIS 16 middle filter traffic and 64% of US 53 middle filter traffic leaves the study area on longer trips. In contrast WIS 35 is used for shorter trips and 50% of these trips end within the study area.

Next Steps

In future reports for the La Crosse Safety and Operations Study further O-D analysis will be completed. In the next steps of this analysis include:

- Developing a detailed O-D matrix showing traffic between all zones
- Analyzing possible routing with future improvement alternatives
- Considering possible detouring with future projects and road closures

Appendix 7: Historical Crash Analysis Methodology

AECOM
1350 Deming Way
Middleton, WI 53562
aecom.com

Project name:
La Crosse Safety & Operations Study

Project ref:
1630-08-00

To:
Josh Koebernick, WisDOT
Ruchi Datta, WisDOT

CC:
Rich Cannon, WisDOT
Andy Winga, WisDOT
Michael Hoelker, WisDOT

From:
Derek Salomonsen

Date:
May 28, 2021

Memorandum

Subject: Historical Crash Analysis

AECOM is working with the Wisconsin Department of Transportation (WisDOT) Southwest Region to complete a Safety & Operations Study of major north-south roadways in the City of La Crosse, WI. This study includes an analysis of the crash history along project roadways. The purpose of this memo is to document the methodology and results of the historical crash analysis effort.

Methodology

The historical crash analysis follows WisDOT's Safety Certification Process (SCP). The SCP steps included in this memo are the system screening and crash vetting. Future analysis will include contributing geometric analysis and the safety mitigation certification process.

System Screening

A system screening was completed for crashes that occurred between January 2014 and December 2018. The screening identified intersections and highway segments flagged as sites of promise, or locations that have a high potential to reduce crashes with targeted improvements. The following WisDOT tools were used for identifying these sites of promise:

- Safety Certification Mapping (SCM) Tool in WisTransPortal
- WisDOT SW Region's Intersection Network Screening Spreadsheet

An exhibit showing flagged segments and intersections in the study area is attached.

Safety Certification Mapping Tool

The SCM tool flagged segments along the State Highway Network that have a total crash rate or serious injury crash rate that exceeds the statewide average upper control limit (UCL)[1]. Segments are also flagged if a pedestrian or bicycle crash had occurred in the segment. This tool flagged 117 segments in the study area, with a total of 2,701 flagged crashes.

The results from the SCM tool are attached.

This tool did not provide data for Losey Blvd since it is not a State Highway. To incorporate Losey Blvd into the area-wide crash analysis, it was segmented based on typical section and a network screening was completed that matches the system screening process for state highways. Crashes were assigned to an intersection or segment along Losey Boulevard based on

[1] Source: 2018 Statewide Average Crash Rates and Upper Control Limits Memo.

latitude/longitude data and police reports. The results of the Losey Blvd screening are in Table 1 below with flagged segments highlighted in red.

Table 1: Losey Boulevard Screening

Losey Blvd. Segment	Total Crashes	Total Crash Rate	KAB Crash Rate	Statewide Average + UCL	
				Total	KAB
US 14 to Ward Ave.	44	430.53	39.14	531.39	81.17
Ward Ave. to WIS 33.	168	508.24	60.50	501.48	70.64
WIS 33 to WIS 16	233	300.54	38.70	488.47	66.07

The Losey Blvd segment from Ward Avenue to WIS 33 was flagged due to its total crash rate exceeding the statewide average UCL[2].

Intersection Network Screening

The WisDOT Intersection Network Screening Spreadsheet included flagged intersections on the state highway network that are performing historically worse than intersections with similar characteristics. Intersections are flagged when the Level of Service of Safety (LOSS) for total crashes or Injury crashes is a category 4. A total of 58 intersections were flagged in the study area.

The LOSS categories indicate the potential for crash reduction at an intersection. Each LOSS is as indicated below:

- LOSS 1: Low potential for crash reduction
- LOSS 2: Low to moderate potential for crash reduction
- LOSS 3: Moderate to high potential for crash reduction
- LOSS 4: High potential for crash reduction.

Intersections not located on the State Highway Network can be added to this spreadsheet for inclusion with the screening process if the pertinent traffic and geometric data is available for those intersections. All Losey Blvd were added this spreadsheet. No Losey Blvd intersections were flagged.

The results from the Intersection Network Screening Tool are attached.

System Screening Results

The SCM and Intersection Network Screening Spreadsheet have overlap since each tool flags sites of promise independently of the other tool. Therefore, combining the flagged crashes from each tool will create duplicates. The study area included flagged segments and intersections with a total of 3,390 crashes. A summary of crashes at flagged locations is in Table 2.

[2] Peer Group 330: Multilane Undivided and One-Way Highways

Table 2: Crash Data Summary at Flagged Locations

Segment	Start Limit	End Limit	Flagged SCM Crashes	Flagged Intersection Crashes	Total Flagged Crashes
WIS 16 (E/W)	7th St.	Losey Blvd.	335	268	391
WIS 16 (N/S)	La Crosse St.	WIS 157	488	335	655
Downtown NB (4th St.)	Hood St.	La Crosse St.	330	229	355
Downtown SB (3rd St.)	La Crosse St.	Hood St.	363	265	390
US 53	La Crosse St.	I-39	318	126	368
US 14	Hood St.	Losey Blvd.	152	127	261
WIS 35 (N)	US 14	WIS 16	385	225	452
STH 35 (S)	WIS 16	US 53	330	121	351
Losey Blvd	US 14	La Crosse St.	168	0	168
		Total	**2,869**	**1,696**	**3,391**

Crash Vetting

Once the sites of promise were identified, a comprehensive crash data verification process, “crash vetting” was conducted for all flagged crashes identified from the system screening. This process includes reviewing all flagged crashes and confirming their relevance to the project and determining if they should be analyzed further.

Additional data was gathered so a more detailed review of each crash could be completed. The additional data included:

- Crash data from the University of Wisconsin Traffic Operations and Safety (TOPS) Laboratory WisTransPortal was downloaded for the entire study area and used to analyze all bike and pedestrian crashes in the study area.
- Police crash reports were requested for all flagged crashes (DT4000/MV4000).

Each flagged crash was reviewed for inclusion in the study based on the ability to target the crash for engineering improvement. Other crashes were vetted out when the cause of the crash was due to outlying factors not attributed to the roadway or if the crash could not be targeted with an engineering improvement. Below are the primary reason crashes were vetted out of this study:

- If the crash did not occur in the study area.
- If the crash was caused by a deer or other animal.
- If the crash was caused by a foreign object in the roadway.
- If the crash was caused by vehicle factors, such as blown tire, defective equipment, or engine failure.
- If the crash was a secondary crash caused by another crash located downstream.
- If the crash was related to human error, such as drivers falling asleep, road rage, or excessive speeding.

Portions of the SCM Tool flagged areas outside the study area due to segment termination limits. Crashes were removed at two locations due to this issue:

- US 53 north of the I-90 eastbound on ramp intersection.
- WIS 16 north of the WIS 157 intersection.

Other factors were analyzed for potential crash vetting (inattentiveness, following too close, weather), but they were not vetted out in most cases since many of these crashes were impacted by roadway characteristics or fell within a possible trend that was to be investigated further. A summary of the flagged crashes that were vetted out for each corridor is in Table 3.

Table 3: Summary of Vetted Crash Data

Segment	Start Limit	End Limit	Total Flagged Crashes	Total Vetted Crashes	Total Crashes After Vetting
WIS 16 (E/W)	7th St.	Losey Blvd.	391	62	329
WIS 16 (N/S)	La Crosse St.	WIS 157	655	82	573
Downtown NB (4th St.)	Hood St.	La Crosse St.	355	84	271
Downtown SB (3rd St.)	La Crosse St.	Hood St.	390	70	320
US 53	La Crosse St.	I-90	368	-16	384
US 14	Hood St.	Losey Blvd.	261	54	207
WIS 35 (N)	US 14	WIS 16	452	80	372
STH 35 (S)	WIS 16	US 53	351	58	293
Losey Blvd	US 14	La Crosse St.	168	3	165
		Total	**3,391**	**477**	**2,914**

Some intersections fall within multiple corridors and the data for these intersections was moved so all crash data at an intersection would fall within only one corridor. The US 53 (3rd St) & La Crosse St intersection crashes were relocated to the US 53 corridor, which is the reason a negative number is shown in the table above. This method was used at the following intersections:

- US 53 & WIS 35 – All data is included in the US 53 corridor.
- US 53 (3rd St) & La Crosse St – All data is included in the US 53 corridor.
- WIS 16 (La Crosse St) & Losey Blvd – All data is included in the WIS 16 WIS 16 (N/S) corridor.
- WIS 16 (La Crosse St) & WIS 35 (West Ave) – All data is included in the WIS (E/W) corridor.
- US 14/61 (South Ave) & WIS 35 (West Ave) – All data is included in the US 14 corridor.
- US 14/61 (Mormon Coulee Rd) & Losey Blvd – All data is included in the US 14 corridor.

Following completion of the crash vetting, crash diagrams were created for the top 10 flagged intersections, ranked by crash frequency and crash severity. Note that the WIS 16 & Sunset Lane (Frontage Road), WIS 16 & Quarry Road, and WIS 16 & 12th St. intersections were not included in this top ten list because the majority of crashes at these locations were caused by queues from nearby traffic signals. The top 10 intersections account for 27% of all intersection crashes in the study area. The crash diagrams are attached.

Results

Crash statistics were developed and crash trends were identified for all the flagged segments and intersections in the study area. The statistics and trends presented in this section are reported based on the crashes remaining once crash vetting was completed.

Pedestrian and Bicycle Crashes

Pedestrian and bicycle statistics and trends were analyzed separately due to the higher severity and unique nature of these crashes. This analysis includes all bike and pedestrian crashes in the study area, not just those identified in the system screening tools.

Exhibits showing the locations of bicycle and pedestrian crashes are attached.

A total of 92 bicycle crashes and 187 pedestrian crashes occurred in the study area between January 2014 and December 2018. Of those crashes, five bicycle crashes and 118 pedestrian crashes were near miss crashes where a pedestrian or bike

was involved but not part of the collision. The distribution of crash types for bicycle crashes and pedestrian crashes in the study area is in Figure 1.

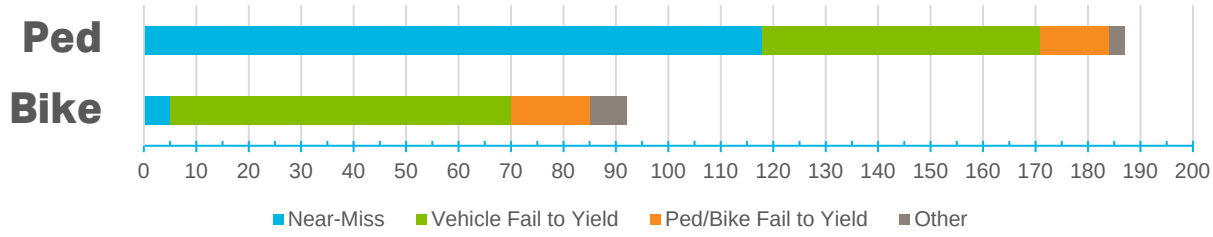


Figure 1: Pedestrian and Bike Crash Types

The crash severity overlaid with crash type for pedestrian and bicycle crashes in the study area is in Figure 2. Crash severity is categorized as follows:

- K: Fatal
- A: Suspected Serious Injury
- B: Suspected Minor Injury
- C: Possible Injury
- PD: Property Damage Only / No Apparent Injury

Note that all near-miss crashes resulted in rear-end crash between two vehicles. This type of crash typically results in minor or no injury, compared to crashes that involve a collision between a vehicle and pedestrian or bicycle that typically result in serious injury.

Important pedestrian and bicycle crash trends that were identified for the study area are listed below:

- 89% of bicycle crashes involved bicyclists using sidewalks and crosswalks instead of the roadway.
- 46% of all bicycle crashes were a result of a vehicle failing to yield while making a right turn at a driveway or intersection.
- 14% of bicycle crashes involved a bicycle failing to yield to traffic.
    - All crashes where a bicyclist utilized the roadway instead of sidewalks or crosswalks were caused by the bicyclist failing to yield to traffic, primarily at two-way stop-controlled intersections.
- 89% of all pedestrian and bicycle crashes occurred at intersections.
- 63% of all pedestrian crashes were near-miss crashes involving a pedestrian crossing a road.

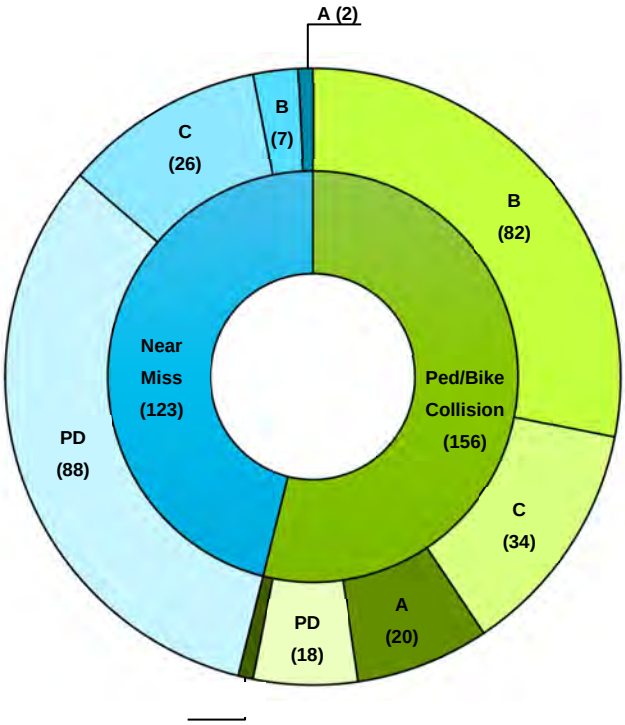


Figure 2: Pedestrian and Bike severity Distribution

The following sections of this report identify detailed pedestrian and bicycle crash trends within each flagged corridor in the study area.

WIS 16 Segment

A total of 573 crashes occurred during the 5-year analysis period along the flagged portions of the WIS 16 corridor, from La Crosse Street to WIS 157. The distribution of crash severity and crash type that occurred along this corridor are in Figure 4 and Table 5.

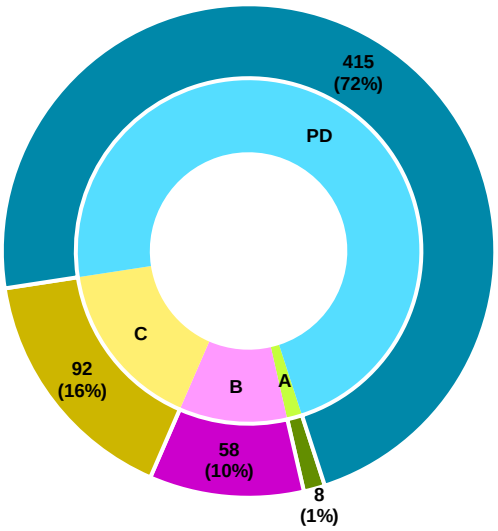


Figure 4: Crash Severity – WIS 16

Table 5: Crash Type – WIS 16

Crash Type	Intersection Crashes	Segment Crashes	Total Crashes
Angle	12	3	15
Head	2	1	3
Left Turn Mainline	7	0	7
Left Turn Sideroad	8	0	8
Rear End Mainline	265	128	393
Rear End Sideroad	42	0	42
Lane Departure	28	16	44
Sideswipe	37	17	54
Bike	7	0	7
Total	408	165	573

The 408 intersection crashes occurred at 10 different intersections along the flagged portions of this corridor. A summary of intersection crashes is shown in Attachment 8. The top three intersections, ranked by crash frequency, are listed below and account for 70% of all intersection crashes along this corridor:

- **WIS 16 & County B/Gillette Street** – 119 total crashes – Highest in study area
  - 70% mainline rear end
- **WIS 16 & WIS 157** – 100 total crashes – Second highest in study area
  - 48% mainline rear end; 19% side road rear end; 15% sideswipe
- **WIS 16 & County B/Conoco Drive** – 67 total crashes
  - 66% mainline rear end

Important trends that were identified for this segment are listed below:

- 54% of mainline rear end crashes occurred during peak hours (7AM to 9AM and 4PM to 6PM) or were noted to have occurred during a time of congestion.
- 86% of bicycle crashes involved a right turning vehicle failing to yield to a bike in a marked crosswalk.
- 72% of injury (KABC) crashes occurred at intersections.
- 50% of the segment lane departure crashes occurred on the bridges just north of County B/Conoco Drive over the railroad (8 southbound crashes and 3 northbound crashes).
- 43% of mainline left turn and 75% of sideroad left turn crashes occurred at the WIS 16 & WIS 157 intersection.
- 37% of lane departure crashes occurred at or near the WIS 16 & County B/Gillette Street intersection.
- 89% of the crashes at the WIS 16 & Quarry Road intersection were caused by southbound queues extending through the intersection from the WIS 16/La Crosse Street signal.

- 63% of the crashes at the WIS 16 & Sunset Boulevard (Frontage Road) intersection were caused by northbound queues extending through the intersection from the County B/Conoco Road signal.

WIS 35 (Lang Dr, George St) Segment

A total of 293 crashes occurred during the 5-year analysis period along the flagged portions of the WIS 35 corridor, from WIS 16 to US 53. The distribution of crash severity and crash type that occurred along this corridor are in Figure 10 and Table 11.

Note that the WIS 35 & WIS 16 intersection crashes are included in 'WIS 16 (La Crosse St): 7th Street to Losey Boulevard', and the US 53 & WIS 35 intersection crashes are included in 'US 53: La Crosse St to I-90'.

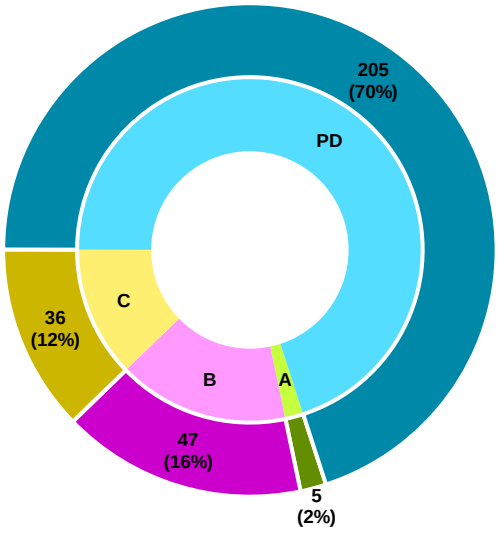


Figure 10: Crash Severity – WIS 35 (Lang Dr, George St)

Table 11: Crash Type – WIS 35 (Lang Dr, George St)

Crash Type	Intersection Crashes	Segment Crashes	Total Crashes
Angle	39	21	60
Head	1	0	1
Left Turn Mainline	18	0	18
Left Turn Sideroad	12	0	12
Rear End Mainline	52	60	112
Rear End Sideroad	10	0	10
Lane Departure	20	1	21
Sideswipe	15	26	41
Bike	11	0	11
Pedestrian	4	3	7
Total	182	111	293

The 182 intersection crashes occurred at 17 different intersections along flagged portions of this corridor. A summary of intersection crashes is attached. The top three intersections, ranked by crash frequency, are listed below and account for 48% of all intersection crashes along this corridor:

- **WIS 35 (George St) & Gillette Street** – 37 total crashes
  - 32% angle; 27% mainline rear end; 22% mainline left turn
- **WIS 35 (George St) & Clinton Street** – 34 total crashes
  - 29% mainline rear end; 26% lane departure; 15% angle; 15% bike
- **WIS 35 (Lang Dr) & Monitor Street** – 16 total crashes
  - 31% mainline left turn; 25% mainline rear end;

Important trends that were identified for this segment are listed below:

- 42% of bicycle crashes occurred at the WIS 35 & Clinton Street intersection.
- 47% of mainline rear end crashes occurred during peak hours (7AM to 9AM and 4PM to 6PM), or was noted to have occurred during periods of congestion.
- 66% of injury (KABC) crashes occurred at intersections.

- 95% of all segment angle crashes occurred at driveways. 53% of all intersection angle crashes occurred at signalized intersections and 47% occurred at side road stop-controlled intersections.
- 14% of all crashes (40 crashes) involved entering or existing a driveway.
  - 50% resulted in an angle crash, and 30% mainline rear end crashes.
  - 23% (9 crashes) occurred at the Menards driveways and 15% occurred at the Kwik Trip driveways near US 53.

US 53 (Rose St, Copeland Ave) Segment

A total of 384 crashes occurred during the 5-year analysis period along the flagged portions of the US 53 corridor, from La Crosse Street to I-90. The distribution of crash severity and crash type that occurred along this corridor are in Figure 7 and Table 8.

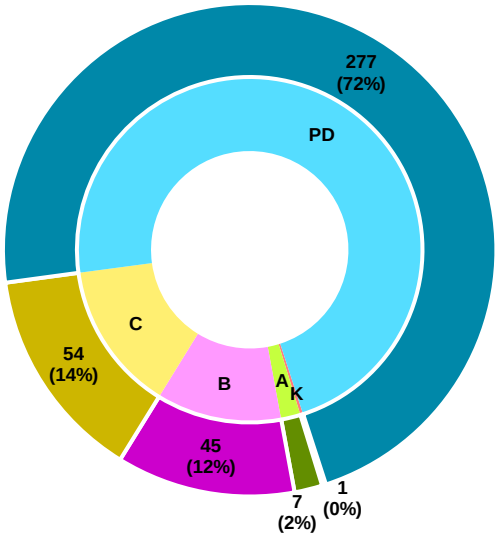


Figure 7: Crash Severity – US 53

Table 8: Crash Type – US 53

Crash Type	Intersection Crashes	Segment Crashes	Total Crashes
Angle	31	10	41
Head	1	0	1
Left Turn Mainline	15	2	17
Left Turn Sideroad	20	0	20
Rear End Mainline	101	55	156
Rear End Sideroad	39	0	39
Lane Departure	24	3	27
Sideswipe	37	21	58
Bike	10	3	13
Pedestrian	10	2	12
Total	288	96	384

The 288 intersection crashes occurred at 19 different intersections along flagged portions of this corridor. A summary of intersection crashes is attached. The top three intersections, ranked by crash frequency, are listed below and account for 60% of all intersection crashes along this corridor:

- **US 53 (3rd St, Copeland Ave) & La Crosse Street** – 67 total crashes
  - 43% mainline rear end; 15% lane departure
- **US 53 & WIS 35** – 58 total crashes
  - 40% sideroad rear end (WIS 35); 38% mainline rear end (US 53)
- **US 53 (Rose St) & Clinton Street** – 47 total crashes
  - 47% mainline rear end

Important trends that were identified for this segment are listed below:

- 40% of mainline rear end crashes occurred during peak hours (7AM to 9AM and 4PM to 6PM).
- 36% of bicycle and pedestrian crashes occurred between Clinton Street and Sill Street (7 pedestrian and 2 bicycle crashes). The Black River Beach, Copeland Park, Kwik Trip, and Black River boat landings are all generators of bikes and pedestrians.

- 73% of injury (KABC) crashes occurred at intersections.
- The following trends were found at the US 53 & La Crosse Street intersection:
  - 80% (8/10) of lane departure crashes involved a semi making a southbound right turn, even though it is signed for NO right turn.
  - 86% (24/28) of the mainline rear end crashes were on the northbound approach.

WIS 16 (La Crosse St) Segment

A total of 329 crashes occurred during the 5-year analysis period along the flagged portions of the WIS 16 corridor from 7th St to Losey Blvd. The distribution of crash severity and crash type that occurred along this corridor are in Figure 3 and Table 4.

Note that the WIS 16 & Losey Blvd intersection crashes are included in 'WIS 16: La Crosse Street to WIS 157'.

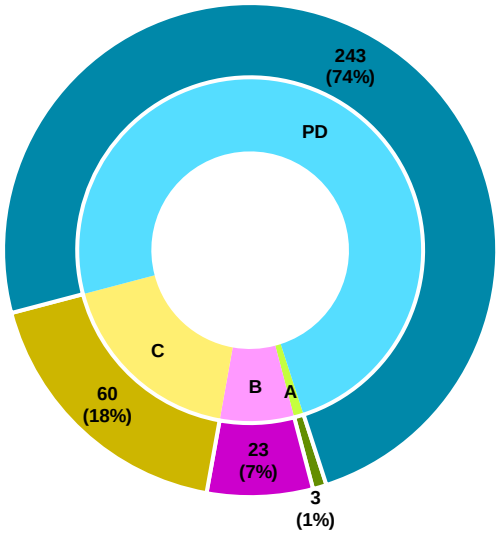


Figure 3: Crash Severity – WIS 16 (La Crosse St)

Table 4: Crash Type – WIS 16

Crash Type	Intersection Crashes	Segment Crashes	Total Crashes
Angle	23	12	35
Left Turn Mainline	19	0	19
Left Turn Sideroad	2	0	2
Rear End Mainline	141	50	191
Rear End Sideroad	25	0	25
Lane Departure	18	3	21
Sideswipe	18	7	25
Bike	4	0	4
Pedestrian	7	0	7
Total	257	72	329

The 257 intersection crashes occurred at 18 different intersections along the flagged portions of this corridor. A summary of intersection crashes is attached. The top three intersections, ranked by crash frequency, are listed below and account for 61% of all intersection crashes along this corridor:

- **WIS 16 (La Crosse St) & WIS 35 (West Ave)** – 83 total crashes – Third highest in study area
  - 29% rear ends on WIS 35; 28% rear ends on WIS 16
- **WIS 16 (La Crosse St) & East Avenue** – 43 total crashes
  - 86% mainline rear end
- **WIS 16 (La Crosse St) & 12th Street** – 32 total crashes
  - 34% mainline rear end; 31% mainline left turn; 25% angle

Important crash trends identified for this segment are listed below:

- 36% of mainline rear end crashes occurred during peak hours (7AM to 9AM and 4PM to 6PM).
- 82% of bicycle and pedestrian crashes occurred at the WIS 16 (La Crosse St) & WIS 35 (West Ave) intersection and the two adjacent intersections (12th Street and Oakland Street). This area is busy with students biking and walking to/from the Viterbo and University Wisconsin-La Crosse campuses.

- 84% of injury (KABC) crashes occurred at intersections.
- 33% (24 crashes) of segment crashes involved driveways (East of WIS 35) or alleys (West of WIS 35). 13 crashes involved a vehicle exiting a driveway or alley, and 11 crashes involved a vehicle stopping to turn into a driveway or alley.
- 34% of the crashes at the WIS 16 & 12th Street intersection were caused by eastbound queues extending through the intersection from the WIS 35 signal.

Losey Blvd Segment

A total of 165 crashes occurred during the 5-year analysis period along the flagged portions of the Losey Boulevard corridor, from US 14 to WIS 16. The distribution of crash severity and crash type that occurred along this corridor are in Figure 11 and Table 12.

Note that the WIS 16 & Losey Boulevard intersection crashes are included in 'WIS 16: La Crosse Street to WIS 157' and the US 14 & Losey Boulevard intersection crashes are included in 'US 14/61 (South Ave, Mormon Coulee Rd): Hood Street to Losey Boulevard'.

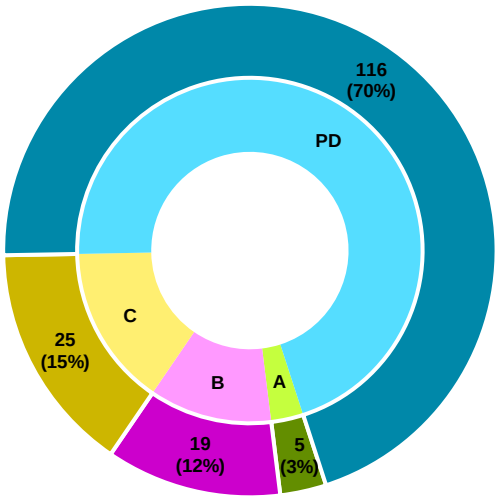


Figure 11: Crash Severity – Losey Blvd.

Table 12: Crash Type to Losey Blvd.

Crash Type	Intersection Crashes	Segment Crashes	Total Crashes
Angle	23	1	24
Head	1	1	2
Left Turn Mainline	9	0	9
Left Turn Sideroad	1	0	1
Rear End Mainline	53	10	63
Rear End Sideroad	13	0	13
Lane Departure	10	7	17
Sideswipe	6	9	15
Bike	13	0	13
Pedestrian	7	1	8
Total	136	29	165

The 136 intersection crashes occurred at 17 different intersections along flagged portions of this corridor. A summary of intersection crashes is attached. The top three intersections, ranked by crash frequency, are listed below and account for 73% of all intersection crashes along this corridor:

- **Losey Boulevard & Green Bay Street** – 51 total crashes
  - 57% mainline rear end; 18% angle
- **Losey Boulevard & WIS 33** – 35 total crashes
  - 37% mainline rear end (Losey Blvd); 20% sideroad rear end (WIS 33)
- **Losey Boulevard & Ward Avenue** – 13 total crashes
  - 23% sideroad rear end; 23% lane departure

Important trends that were identified for this segment are listed below:

- 43% of pedestrian and bicycle crashes occurred between Travis Street and WIS 33 (6 pedestrian and 3 bicycle crashes).

- 43% of mainline rear end crashes occurred during peak hours (7AM to 9AM and 4PM to 6PM).
- 90% of injury (KABC) crashes occurred at intersections.
- 63% of angle crashes occurred at signalized intersections, with 38% of angle crashes having occurred at the Losey Boulevard and Green Bay Street intersection.

WIS 35 (West Ave) Segment

A total of 372 crashes occurred during the 5-year analysis period along the flagged portions of the WIS 35 corridor, from US 14/61 to WIS 16. The distribution of crash severity and crash type that occurred along this corridor are in Figure 9 and Table 10.

Note that the WIS 35 & WIS 16 intersection crashes are included in 'WIS 16 (La Crosse St): 7th Street to Losey Boulevard', and the US 14 & WIS 35 intersection crashes are included in 'US 14/61 (South Ave, Mormon Coulee Rd): Hood Street to Losey Boulevard'.

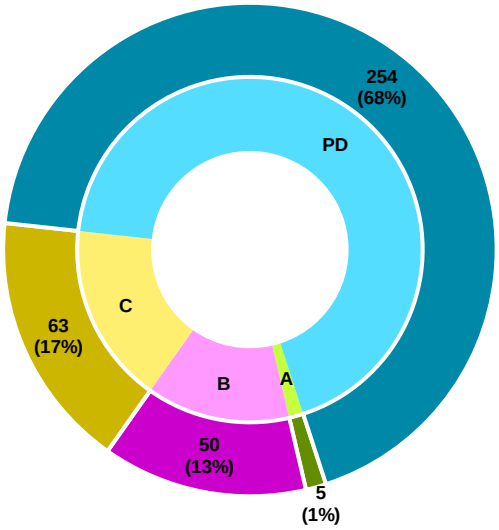


Figure 9: Crash Severity –WIS 35 (West Ave)

Table 10: Crash Type – WIS 35 (West Ave)

Crash Type	Intersection Crashes	Segment Crashes	Total Crashes
Angle	61	0	61
Head	0	1	1
Left Turn Mainline	18	0	18
Left Turn Sideroad	13	0	13
Rear End Mainline	143	21	164
Rear End Sideroad	24	0	24
Lane Departure	17	1	18
Sideswipe	27	11	38
Bike	22	2	24
Pedestrian	11	0	11
Total	336	36	372

The 336 intersection crashes occurred at 21 different intersections along flagged portions of this corridor. A summary of intersection crashes is attached. The top three intersections, ranked by crash frequency, are listed below and account for 47% of all intersection crashes along this corridor:

- **WIS 35 (West Ave) & WIS 33 (Jackson St)** – 72 total crashes
  - 29% mainline rear end
- **WIS 35 (West Ave) & State Street** – 47 total crashes
  - 66% mainline rear end (15% were near miss crashes with a pedestrian)
- **WIS 35 (West Ave) & Cass Street** – 39 total crashes
  - 41% mainline rear end (8% were near miss crashes with a pedestrian); 23% angle; 18% sideroad rear end

Important trends that were identified for this segment are listed below:

- 24% (40 crashes) of rear end crashes included a non-contact pedestrian or bike crossing the roadway.

- 48% of mainline rear end crashes occurred during peak hours (7AM to 9AM and 4PM to 6PM) or were noted to occur during congestion.
- 49% of bike and pedestrian crashes occurred between State Street and Badger Street (10 bicycle and 7 pedestrian crashes). This area is busy with students biking and walking to/from the Viterbo and University Wisconsin-La Crosse campuses.
- 88% (35/40) of the near-miss pedestrian and bicycle crashes occurred between State Street and Badger Street
- 89% of injury (KABC) crashes occurred at intersections.
- 59% of angle crashes were at signalized intersection and 41% were located at side road stop-controlled intersections.

Downtown (4th Street) Segment

A total of 271 crashes occurred during the 5-year analysis period along the flagged portions of the 4th Street (US 14/61/53) corridor, from Hood Street to La Crosse Street. The distribution of crash severity and crash type that occurred along this corridor are in Figure 5 and Table 6.

Note that the US 53 & La Crosse Street intersection crashes are included in 'US 53: La Crosse St to I-90'.

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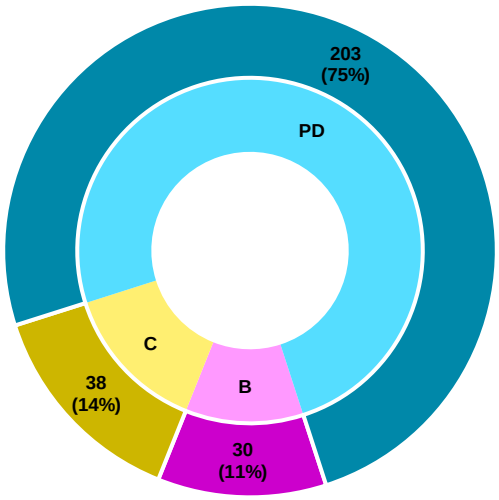


Figure 5: Crash Severity – 4th St

Table 6: Crash Type – 4th St

Crash Type	Intersection Crashes	Segment Crashes	Total Crashes
Angle	57	3	60
Head	1	0	1
Left Turn Sideroad	4	0	4
Rear End Mainline	40	23	63
Rear End Sideroad	13	0	13
Lane Departure	8	6	14
Sideswipe	62	39	101
Bike	6	0	6
Pedestrian	8	1	9
Total	199	72	271

The 199 intersection crashes occurred at 14 different intersections along the flagged portions of this corridor. A summary of intersection crashes is attached. The top four intersections, ranked by crash frequency, are listed below and account for 46% of all intersection crashes along this corridor:

- **US 53 NB (4th St) & Jay Street** – 26 total crashes
  - 39% sideswipe; 27% mainline rear end
- **US 53 NB (4th St) & Vine Street** – 24 total crashes
  - 41% mainline rear end (33% near miss with a pedestrian); 21% sideswipe
- **US 53 NB (4th St) & State Street** – 21 total crashes
  - 29% angle; 24% mainline rear end; 19% sideroad rear end; 19% sideswipe

- **US 14/61 NB (4th St) & Cameron Avenue** – 21 total crashes
  - 62% angle; 19% mainline rear end; 19% lane departure

Important trends that were identified for this segment are listed below:

- The corridor primarily had low severity type crashes due to low posted speed limits; 37% of all crashes were sideswipe crashes, 23% were mainline rear end crashes, and 22 % were sideroad rear end crashes.
- 80% of pedestrian and bike crashes occurred between King Street and Vine Street (7 pedestrian and 5 bicycle crashes).
- 85% of injury (KABC) crashes occurred at intersections.
- 35% of sideswipe crashes were due to a vehicle turning from an incorrect lane on 4th Street.
- 11% (31) of all crashes involved a parked vehicle and 5% (13) of all crashes involved drunk drivers.
- 85% (11/13) of angle crashes that occurred at the US 14/61 NB (4th St) & Cameron Avenue intersection were due to a northbound vehicle running a red light.
- 32% of the segment crashes occurred between King Street and Main Street. 23% of those crashes (7/23) were noted to have occurred on the horizontal curve just north of Pearl Street.

Downtown (3rd Street) Segment

A total of 320 crashes occurred during the 5-year analysis period along the flagged portions of the 3rd Street (US 14/61/53) corridor, from Hood Street to La Crosse Street. The distribution of crash severity and crash type that occurred along this corridor are in Figure 6 and Table 7.

Note that the US 53 & La Crosse Street intersection crashes are included in 'US 53: La Crosse St to I-90'.

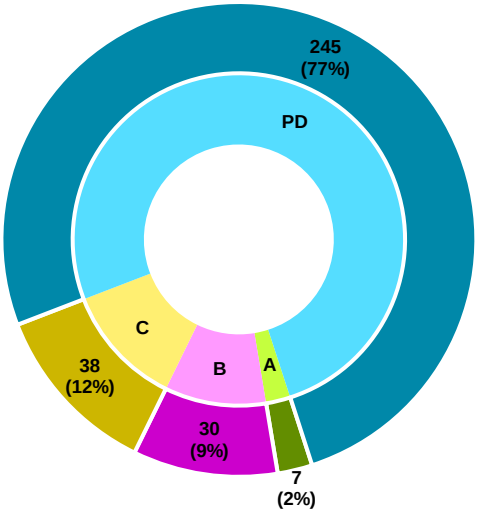


Figure 6: Crash Severity – 3rd St.

Table 7: Crash Type – 3rd St.

Crash Type	Intersection Crashes	Segment Crashes	Total Crashes
Angle	50	2	52
Left Turn Sideroad	10	0	10
Rear End Mainline	55	35	90
Rear End Sideroad	20	1	21
Lane Departure	9	5	14
Sideswipe	78	40	118
Bike	5	0	5
Pedestrian	10	0	10
Total	237	83	320

The 237 intersection crashes occurred at 15 different intersections along flagged portions of this corridor. A summary of intersection crashes is attached. The top three intersections, ranked by crash frequency, are listed below and account for 46% of all intersection crashes along this corridor:

- **US 53 SB (3rd St) & Cameron Avenue** – 45 total crashes
  - 47% angle; 20% sideswipe; 18% sideroad rear end

- **US 53 SB (3rd St) & Jay Street** – 34 total crashes
  - 32% sideswipe; 24% mainline rear end
- **US 53 SB (3rd St) & Main Street** – 30 total crashes
  - 33% mainline rear end; 33% sideswipe

Important trends that were identified for this segment are listed below:

- The corridor primarily had low severity type crashes due to low posted speed limits; 37% of all crashes were sideswipe crashes and 28% were mainline rear end crashes.
- 40% of the bicycle and pedestrian crashes occurred at the US 53 SB (3rd St) & Pearl Street intersection (5 pedestrian crashes and 1 bicycle crash). The La Crosse Center west of this intersection is a large pedestrian generator for special events.
- 84% of injury (KABC) crashes occurred at intersections.
- 46% sideswipe crashes were due to a vehicle turning left from incorrect lane
- 38 crashes involved a parked vehicle and 14 crashes involved drunk drivers.
- The following trends were identified at the US 53 SB (3rd St) & Cameron Avenue intersection.
  - 15 of the 21 angle crashes that occurred were due to a vehicle running a red light, nine of them involving a southbound vehicle failing to stop at a red light.
  - All the sideroad rear end crashes involved eastbound right turning vehicles.

US 14/61 (South Ave, Mormon Coulee Rd) Segment

A total of 207 crashes occurred during the 5-year analysis period along the flagged portions of the US 14 corridor, from Hood Street to Losey Boulevard. The distribution of crash severity and crash type that occurred along this corridor are in Figure 8 and Table 9.

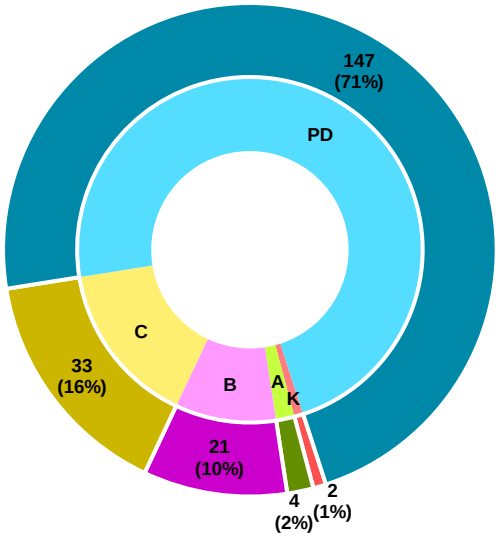


Figure 8: Crash Severity – US 14/61

Table 9: Crash Type – US 14/61

Crash Type	Intersection Crashes	Segment Crashes	Total Crashes
Angle	21	5	26
Left Turn Mainline	9	0	9
Left Turn Sideroad	12	0	12
Rear End Mainline	60	33	93
Rear End Sideroad	13	0	13
Lane Departure	14	5	19
Sideswipe	17	9	26
Bike	3	1	4
Pedestrian	4	1	5
Total	153	54	207

The 153 intersection crashes occurred at 13 different intersections along flagged portions of this corridor. A summary of intersection crashes is attached. The top three intersections, ranked by crash frequency, are listed below and account for 72% of all intersection crashes along this corridor:

- **US 14/61 (South Ave) & WIS 35** (West Ave) – 44 total crashes
  - 45% mainline rear end (US 14/61); 14% side road rear end (WIS 35)
- **US 14 /61 (South Ave) & 7th Street** – 33 total crashes
  - 33% mainline rear end; 21% sideswipe; 15% lane departure
- **US 14/61 (South Ave) & Ward Avenue** – 33 total crashes
  - 39% mainline rear end

Important trends that were identified for this segment are listed below:

- 72% of injury (KABC) crashes occurred at intersections
  - One fatal crash involved a pedestrian illegally crossing US 14 and the other involved a pedestrian entering an intersection against the pedestrian signal.
- 31% of all segment crashes were a result of a vehicle exiting or slowing to enter a driveway along US 14.
- 65% of all mainline rear end crashes occurred in the northbound direction.

At-Grade Railroad Crossings

Historical crash data was analyzed at three at-grade railroad crossings in the study area to determine if any crashes were related to the railroad crossing or railroad signal.

US 14/61, near Green Bay Street

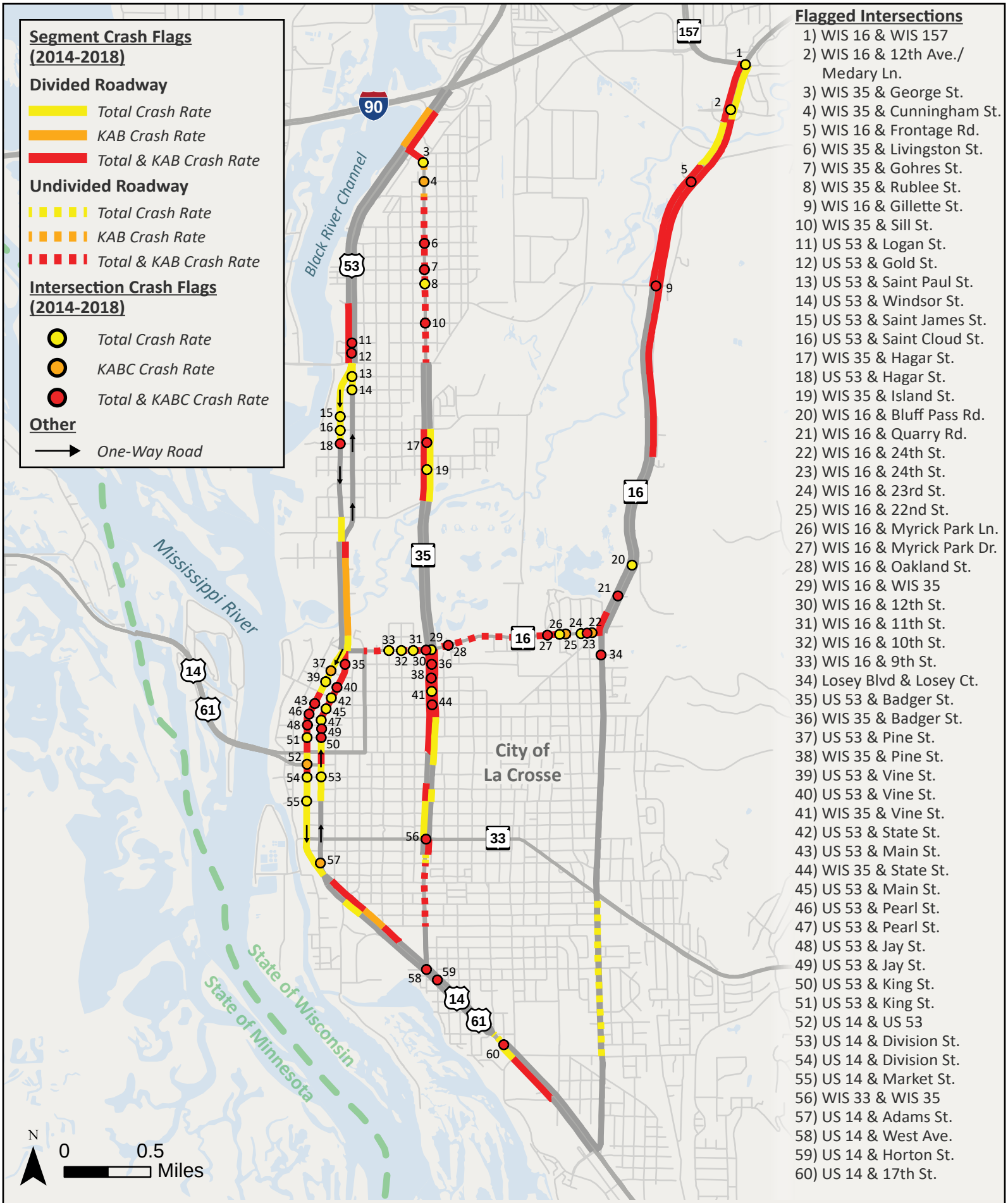
The at-grade crossing just south of the US 14 & Green Bay Street intersection had a total of 4 crashes occur at or near the crossing. All these crashes were in the northbound direction, but none of them were caused by the railroad crossing. One crash was due to a driveway just south of the crossing, and the other 3 were rear-end crashes on the south approach of the US 14 & Green Bay St. signalized intersection. Crash report narratives for crashes that occurred at this intersection indicate northbound US 14 queues occasionally extend through the railroad crossing, especially during peak periods.

WIS 35, near Barlow Street

The at-grade crossing just north of the WIS 35 & Barlow Street intersection had a total of 3 crashes occur at or near the crossing. All these crashes were in the southbound direction, but none of them were caused by the railroad crossing. All crashes appear to be due to queues from the US 14 & WIS 35 signalized intersection. Crash report narratives for crashes that occurred at this intersection indicate southbound WIS 35 queues occasionally extend through the railroad crossing, especially during peak periods.

Losey Boulevard, near Ward Avenue

The at-grade crossing just south of the Losey Boulevard and Ward Avenue intersection had a total of 17 crashes occur at or near the crossing. None of these crashes were caused by the railroad crossing. The majority of these crashes were due to driveways (7 crashes). The other crashes were due to southbound left turn queues at Diagonal Road or Ristow Court (4 crashes) and northbound queues due to the Ward Avenue signalized intersection (2 crashes). The remaining 4 crashes were caused by unknown factors. The close proximity of driveways and side roads to this crossing creates queues that regularly extend over the crossing. Crash report narratives for crashes that occurred at this intersection indicate northbound queues occasionally extend through the crossing during peak periods.



Flagged Intersections

1) WIS 16 & WIS 157
2) WIS 16 & 12th Ave./ Medary Ln.
3) WIS 35 & George St.
4) WIS 35 & Cunningham St.
5) WIS 16 & Frontage Rd.
6) WIS 35 & Livingston St.
7) WIS 35 & Gohres St.
8) WIS 35 & Rublee St.
9) WIS 16 & Gillette St.
10) WIS 35 & Sill St.
11) US 53 & Logan St.
12) US 53 & Gold St.
13) US 53 & Saint Paul St.
14) US 53 & Windsor St.
15) US 53 & Saint James St.
16) US 53 & Saint Cloud St.
17) WIS 35 & Hagar St.
18) US 53 & Hagar St.
19) WIS 35 & Island St.
20) WIS 16 & Bluff Pass Rd.
21) WIS 16 & Quarry Rd.
22) WIS 16 & 24th St.
23) WIS 16 & 24th St.
24) WIS 16 & 23rd St.
25) WIS 16 & 22nd St.
26) WIS 16 & Myrick Park Ln.
27) WIS 16 & Myrick Park Dr.
28) WIS 16 & Oakland St.
29) WIS 16 & WIS 35
30) WIS 16 & 12th St.
31) WIS 16 & 11th St.
32) WIS 16 & 10th St.
33) WIS 16 & 9th St.
34) Losey Blvd & Losey Ct.
35) US 53 & Badger St.
36) WIS 35 & Badger St.
37) US 53 & Pine St.
38) WIS 35 & Pine St.
39) US 53 & Vine St.
40) US 53 & Vine St.
41) WIS 35 & Vine St.
42) US 53 & State St.
43) US 53 & Main St.
44) WIS 35 & State St.
45) US 53 & Main St.
46) US 53 & Pearl St.
47) US 53 & Pearl St.
48) US 53 & Jay St.
49) US 53 & Jay St.
50) US 53 & King St.
51) US 53 & King St.
52) US 14 & US 53
53) US 14 & Division St.
54) US 14 & Division St.
55) US 14 & Market St.
56) WIS 33 & WIS 35
57) US 14 & Adams St.
58) US 14 & West Ave.
59) US 14 & Horton St.
60) US 14 & 17th St.

Segment & Intersection Crash Flags

La Crosse Safety and Operations Study

May 2021

WisDOT ID: 1630-08-00

Safety Certification Mapping (SCM) Tool

Design ID
1630-08-00

Construction ID(s)

Project Title
USH 14/61 - IH-90

Project Description
USH 14/61 NLY TO IH-90

SCM Comment

Meta Manager Version: 2019-10
Meta Manager Crash Years: 2014-2018
SCM Crash Years: 2014-2018

Sites of Promise

Corridor #	Highway	Start County	End County	Start RP	End RP
1	US 53 NB	LA CROSSE	LA CROSSE	053N002G000	053N008H000

11384: Crash Rate
11385: KAB, Crash Rate
11386: KAB, Crash Rate
11387: KAB, Crash Rate
11388: KAB, Crash Rate
11389: Crash Rate
11390: KAB
11391: KAB, Crash Rate
11395: Crash Rate
11400: KAB, Crash Rate

Corridor #	Highway	Start County	End County	Start RP	End RP
2	US 53 SB	LA CROSSE	LA CROSSE	053S008P000	053S001A000

11861: KAB
11865: KAB, Crash Rate
11866: Crash Rate
11869: Crash Rate
11873: Crash Rate
11874: KAB, Crash Rate
11875: KAB, Crash Rate
11876: Crash Rate

Corridor #	Highway	Start County	End County	Start RP	End RP
3	US 14 EB	LA CROSSE	LA CROSSE	014E005M000	014E011T000

2690: KAB, Crash Rate
2691: Crash Rate
2692: Crash Rate
2693: Crash Rate
2696: Crash Rate
2701: Crash Rate
2702: Crash Rate
2703: KAB, Crash Rate

Corridor #	Highway	Start County	End County	Start RP	End RP
4	US 14 WB	LA CROSSE	LA CROSSE	014W011T000	014W006 000

3051: KAB, Crash Rate
3052: KAB
3053: KAB, Crash Rate
3057: Crash Rate
3058: Crash Rate
3059: KAB, Crash Rate

Corridor #	Highway	Start County	End County	Start RP	End RP
5	WIS 35 NB	LA CROSSE	LA CROSSE	035N114 000	035N121D000

7384: KAB, Crash Rate
7385: Crash Rate
7386: KAB, Crash Rate
7388: Crash Rate
7390: Crash Rate
7391: Crash Rate
7392: Crash Rate
7393: KAB, Crash Rate
7394: KAB, Crash Rate
7397: Crash Rate
7399: KAB, Crash Rate
7400: KAB, Crash Rate
7401: KAB
7402: KAB
7403: KAB, Crash Rate

Corridor #	Highway	Start County	End County	Start RP	End RP
6	WIS 35 SB	LA CROSSE	LA CROSSE	035S121D000	035S115 009

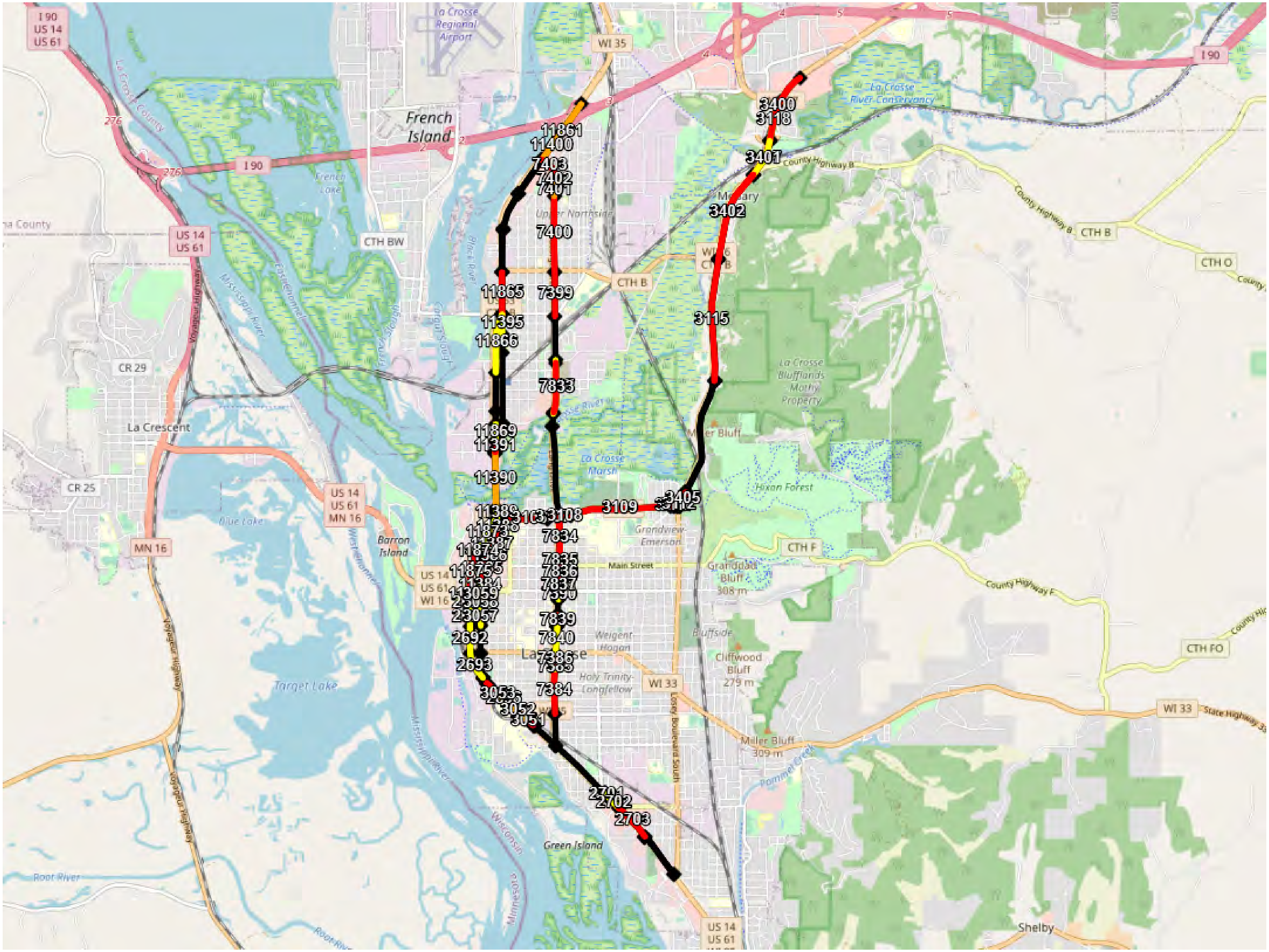
7833: KAB, Crash Rate
7834: KAB, Crash Rate
7835: KAB, Crash Rate
7836: KAB, Crash Rate
7837: KAB, Crash Rate
7839: KAB, Crash Rate
7840: Crash Rate

Corridor #	Highway	Start County	End County	Start RP	End RP
7	WIS 16 EB	LA CROSSE	LA CROSSE	016E004 038	016E013K000

3106: KAB, Crash Rate
3107: KAB, Crash Rate
3108: KAB, Crash Rate
3109: KAB, Crash Rate
3110: KAB, Crash Rate
3111: KAB, Crash Rate
3112: KAB, Crash Rate
3115: KAB, Crash Rate
3116: KAB, Crash Rate
3117: KAB, Crash Rate
3118: Crash Rate

Corridor #	Highway	Start County	End County	Start RP	End RP
8	WIS 16 WB	LA CROSSE	LA CROSSE	016W014M045	016W005M005

3400: KAB, Crash Rate
3401: Crash Rate
3402: KAB, Crash Rate
3405: KAB, Crash Rate


French Island
La Crosse Regional Airport
La Crescent
I 90
US 14
US 61
WI 35
CTH BW
CTH B
CTH O
CTH F
CTH FO
WI 33
MN 16
CR 29
CR 25
WI 16
Main Street
La Crosse
Target Lake
Blue Lake
Barron Island
Green Island
Root River
Shelby
Grandview-Emerson
Hixon Forest
La Crosse Marsh
La Crosse Bluffland Mathy Property
Upper Northside
Cliffwood Bluff 279 m
Granddad Bluff 308 m
Miller Bluff 309 m
Bluffside
3400
3118
3401
3402
3115
3405
3109
3108
11861
11400
7403
7402
7401
7400
11865
7399
11395
11866
7833
11869
11391
11390
11389
7834
7835
7836
7837
7839
7840
7386
7384
23057
2692
2693
3052
3051
2701
2702
2703

Corridor # 1: US 53 NB - 053N002G000 - 053N008H000

Meta Manager Version: 2019-10 Crash Years: 2014-2018					SCM Crash Years: 2014-2018					
PDP ID	Crash	KAB	Int Crash	Int KAB	K	A	B	C	O	TOTAL
11384	1.629						1	5	11	17
11385	3.8211	2.5183					8	12	51	71
11386	3.6391	1.1432					2	2	30	34
11387	3.3002	1.6282					5	9	45	59
11388	4.1015	3.5116				1	10	8	56	75
11389	2.8516						1	6	25	32
11390		1.0678				4	6	5	33	48
11391	1.634	2.2816				1	2		8	11
11392						1	1		14	16
11393							9	4	58	71
11394							1	5	17	23
11395	1.4138					1	1	6	28	36
11396							9	12	30	51
11397						1	7	4	17	29
11398									2	2
11399							8	11	35	54
11400	1.1243	1.1054					3	3	28	34
TOTAL						9	74	92	488	

Manner of Collision

PDP ID	NO COLLISION	REAR END	SS OPP	SS SAME	OTHER	TOTAL
11384	3	5	1	6	2	17
11385	11	17	3	20	20	71
11386	4	11		15	4	34
11387	5	23		15	16	59
11388	6	33		23	13	75
11389	7	11		2	12	32
11390	11	22		4	11	48
11391	4	5		1	1	11
11392	5	7		4		16
11393	5	26		17	23	71
11394	3	10		6	4	23
11395	4	24		4	4	36
11396	10	17	2	5	17	51
11397	4	14	1	3	7	29
11398	1			1		2

PDP ID	NO COLLISION	REAR END	SS OPP	SS SAME	OTHER	TOTAL
11399	2	46		5	1	54
11400	2	17		7	8	34

Corridor # 2: US 53 SB - 053S008P000 - 053S001A000

Meta Manager Version: 2019-10 Crash Years: 2014-2018					SCM Crash Years: 2014-2018					
PDP ID	Crash	KAB	Int Crash	Int KAB	K	A	B	C	O	TOTAL
11861		1.1078			1		4	3	26	34
11862							1	3	21	25
11863						1	1	5	10	17
11864							4		6	10
11865	1.2483	1.1222					9	7	22	38
11866	1.1395						10	10	50	70
11867							7	4	29	40
11868								1	16	17
11869	1.3398						2	2	23	27
11870								1	6	7
11871						3	4	6	25	38
11872							1		4	5
11873	1.3747						1	3	37	41
11874	4.0586	1.1676							15	15
11875	4.8811	3.9967				6	15	16	130	167
11876	1.3896							4	19	23
TOTAL					1	10	59	65	439	

Manner of Collision

PDP ID	NO COLLISION	REAR END	SS OPP	SS SAME	OTHER	TOTAL
11861	4	18		6	6	34
11862	1	18		5	1	25
11863		16			1	17
11864	4	1		3	2	10
11865	6	15		2	15	38
11866	6	33	1	14	16	70
11867	5	6	1	19	9	40
11868	2	8		4	3	17
11869	4	7	3	6	7	27
11870	2	2		1	2	7
11871	11	19	1	3	4	38
11872	2	3				5
11873	11	18		8	4	41
11874	2	8		4	1	15
11875	18	62	5	50	32	167
11876	1	14		4	4	23

PDP ID	NO COLLISION	REAR END	SS OPP	SS SAME	OTHER	TOTAL

Corridor # 3: US 14 EB - 014E005M000 - 014E011T000

Meta Manager Version: 2019-10 Crash Years: 2014-2018					SCM Crash Years: 2014-2018					
PDP ID	Crash	KAB	Int Crash	Int KAB	K	A	B	C	O	TOTAL
2690	2.488	3.0153				1	5	5	16	27
2691	1.0975						1	3	18	22
2692	1.3792						2	4	32	38
2693	1.215						4	2	24	30
2694						1			1	2
2695									3	3
2696	1.623					1	1	3	15	20
2697								3	5	8
2698						1		1	1	3
2699							3	5	11	19
2700						3	13	15	73	104
2701	1.0342						2	2	15	19
2702	1.8241						2	5	16	23
2703	1.8997	1.0699					5	8	43	56
2704					1		2	6	23	32
TOTAL					1	7	40	62	296	

Manner of Collision

PDP ID	NO COLLISION	REAR END	SS OPP	SS SAME	OTHER	TOTAL
2690	3	1		5	18	27
2691	1	3		13	5	22
2692	9	12		10	7	38
2693	6	1		12	11	30
2694	1			1		2
2695		1		1	1	3
2696	7	4		6	3	20
2697		7		1		8
2698	2				1	3
2699	2	12		4	1	19
2700	8	54	2	11	29	104
2701		11	1	3	4	19
2702	4	16			3	23
2703	8	25	1	10	12	56
2704	6	15		7	4	32

Corridor # 4: US 14 WB - 014W011T000 - 014W006 000

Meta Manager Version: 2019-10 Crash Years: 2014-2018					SCM Crash Years: 2014-2018					
PDP ID	Crash	KAB	Int Crash	Int KAB	K	A	B	C	O	TOTAL
3047						2	3	5	27	37
3048										0
3049										0
3050								1	2	3
3051	1.1042	2.736					3		1	4
3052		1.2078					2	1	7	10
3053	1.4863	1.679			1	1	2	2	14	20
3054										0
3055							2	3	11	16
3056							3	4	28	35
3057	1.2332					1	2	3	20	26
3058	1.8429							1	15	16
3059	2.6594	1.5967					5	2	25	32
TOTAL					1	4	22	22	150	

Manner of Collision

PDP ID	NO COLLISION	REAR END	SS OPP	SS SAME	OTHER	TOTAL
3047	9	13		7	8	37
3048						0
3049						0
3050		3				3
3051		4				4
3052		7	1	1	1	10
3053	2	10		5	3	20
3054						0
3055	6	2	1	2	5	16
3056	3	4		14	14	35
3057	1	3		10	12	26
3058	1	1		6	8	16
3059	4	9		8	11	32

Corridor # 5: WIS 35 NB - 035N114 000 - 035N121D000

Meta Manager Version: 2019-10 Crash Years: 2014-2018					SCM Crash Years: 2014-2018					
PDP ID	Crash	KAB	Int Crash	Int KAB	K	A	B	C	O	TOTAL
7383							2	6	14	22
7384	1.3318	1.8526				3	9	5	35	52
7385	1.7177								1	1
7386	1.8762	1.3935					1		13	14
7387							2	2	15	19
7388	1.9927							5	14	19
7389							4	3	11	18
7390	1.3436								3	3
7391	1.0176						1	4	11	16
7392	1.032						1	2	3	6
7393	2.0806	1.3582					2		19	21
7394	2.6262	2.4163				1	10	14	49	74
7395					1		8	9	39	57
7396							1	1	2	4
7397	1.1433						5	2	27	34
7398							3	8	23	34
7399	1.5034	1.3347				2	9	13	54	78
7400	2.9213	3.6429				4	15	9	80	108
7401		2.3405					3	2	7	12
7402		2.7326					2	1	5	8
7403	5.7555	1.9074					7	10	55	72
TOTAL					1	10	85	96	480	

Manner of Collision

PDP ID	NO COLLISION	REAR END	SS OPP	SS SAME	OTHER	TOTAL
7383	4	12	1	4	1	22
7384	8	18	2	6	18	52
7385		1				1
7386	1	4		6	3	14
7387	4	9		2	4	19
7388	1	7	1	4	6	19
7389	6	11			1	18
7390		1		1	1	3
7391	1	9		1	5	16
7392		4			2	6
7393	5	11		2	3	21

PDP ID	NO COLLISION	REAR END	SS OPP	SS SAME	OTHER	TOTAL
7394	5	49		7	13	74
7395	8	32	2	12	3	57
7396		2	1	1		4
7397	5	13	2	10	4	34
7398	3	18	1	9	3	34
7399	13	32	2	9	22	78
7400	10	50	3	11	34	108
7401		9			3	12
7402	1	3		1	3	8
7403	6	38	3	11	14	72

Corridor # 6: WIS 35 SB - 035S121D000 - 035S115 009

Meta Manager Version: 2019-10 Crash Years: 2014-2018					SCM Crash Years: 2014-2018					
PDP ID	Crash	KAB	Int Crash	Int KAB	K	A	B	C	O	TOTAL
7832										0
7833	1.0817	1.7582								0
7834	1.7705	1.6728								0
7835	1.3004	1.3582								0
7836	1.5876	2.6668								0
7837	3.3582	2.2024								0
7838										0
7839	2.0876	1.0369								0
7840	1.0877									0
7841										0
TOTAL										

Manner of Collision

PDP ID	NO COLLISION	REAR END	SS OPP	SS SAME	OTHER	TOTAL
7832						0
7833						0
7834						0
7835						0
7836						0
7837						0
7838						0
7839						0
7840						0
7841						0

Corridor # 7: WIS 16 EB - 016E004 038 - 016E013K000

Meta Manager Version: 2019-10 Crash Years: 2014-2018					SCM Crash Years: 2014-2018					
PDP ID	Crash	KAB	Int Crash	Int KAB	K	A	B	C	O	TOTAL
3106	3.0744	1.038								0
3107	8.7878	3.3034								0
3108	6.2525	2.7779								0
3109	3.0095	1.7069								0
3110	4.9293	1.604								0
3111	1.3715	1.9595								0
3112	3.4921	1.112								0
3113										0
3114										0
3115	1.0113	1.1695								0
3116	1.7874	1.2892								0
3117	1.2886	1.3128								0
3118	1.0457									0
TOTAL										

Manner of Collision

PDP ID	NO COLLISION	REAR END	SS OPP	SS SAME	OTHER	TOTAL
3106						0
3107						0
3108						0
3109						0
3110						0
3111						0
3112						0
3113						0
3114						0
3115						0
3116						0
3117						0
3118						0

Corridor # 8: WIS 16 WB - 016W014M045 - 016W005M005

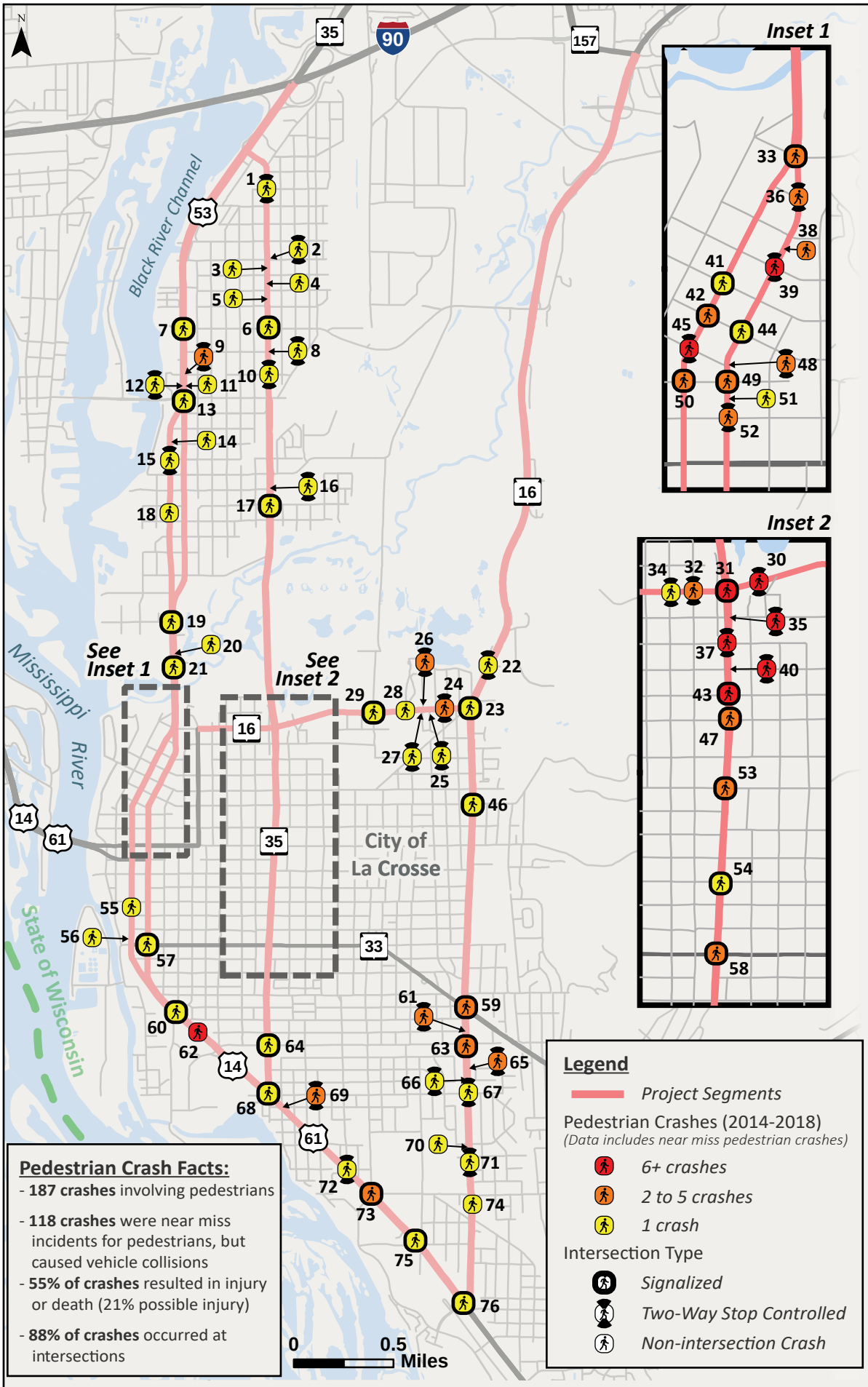
Meta Manager Version: 2019-10 Crash Years: 2014-2018					SCM Crash Years: 2014-2018					
PDP ID	Crash	KAB	Int Crash	Int KAB	K	A	B	C	O	TOTAL
3400	2.3995	1.1266								0
3401	1.4581									0
3402	1.501	1.2092								0
3403										0
3404										0
3405	2.2024	1.7832								0
3406										0
3407										0
TOTAL										

Manner of Collision

PDP ID	NO COLLISION	REAR END	SS OPP	SS SAME	OTHER	TOTAL
3400						0
3401						0
3402						0
3403						0
3404						0
3405						0
3406						0
3407						0

Intersection Network Screening Tool - Flagged Intersections

Safety Certification Worksheet Information							SPF Results					
							TOTAL Crashes (values for entire analysis period)			KABC Crashes (values for entire analysis period)		
INT_ID	Intersection Name (IX_NAME)	LOSS (TOTAL)	PSI (TOTAL)	LOSS (KABC)	PSI (KABC)	Flagged Location (Yes/No)	Observed (TOTAL)	Predicted (TOTAL)	Expected (TOTAL)	Observed (KABC)	Predicted (KABC)	Expected (KABC)
IX_32_02666	STH 16 & CTH B & Gillette St	LOSS 4	45.34	LOSS 4	8.43	Yes	104	55.54	100.88	29	19.01	27.44
IX_32_03005	STH 16 & STH 157	LOSS 4	33.07	LOSS 3	5.13	Yes	99	64.41	97.48	26	20.25	25.37
IX_32_02357	STH 16 & STH 35	LOSS 4	29.13	LOSS 3	5.72	Yes	80	48.57	77.71	23	16.03	21.75
IX_32_01928	STH 33 & STH 35	LOSS 4	30.17	LOSS 4	6.14	Yes	77	44.22	74.39	22	14.36	20.50
IX_32_02248	USH 53 & Main St	LOSS 4	35.90	LOSS 4	3.62	Yes	67	25.78	61.67	13	7.74	11.36
IX_32_02241	STH 35 & State St	LOSS 4	27.09	LOSS 4	7.54	Yes	65	34.95	62.03	21	11.06	18.60
IX_32_02189	USH 53 & Jay St	LOSS 4	33.02	LOSS 4	4.26	Yes	56	13.89	46.91	12	3.86	8.12
IX_32_02404	STH 16 & Quarry Rd	LOSS 4	30.63	LOSS 4	7.47	Yes	50	15.17	45.80	15	5.38	12.85
IX_32_01572	USH 14 & STH 35 & West Ave S	LOSS 4	20.43	LOSS 4	3.34	Yes	50	26.64	47.07	13	8.23	11.57
IX_32_02101	USH 14 & USH 53	LOSS 3	10.73	LOSS 4	6.02	Yes	47	35.11	45.83	19	11.07	17.09
IX_32_02352	STH 16 & 12th St	LOSS 4	27.73	LOSS 4	4.14	Yes	44	5.23	32.97	10	1.46	5.60
IX_32_02176	USH 53 & King St	LOSS 4	23.29	LOSS 4	5.91	Yes	39	11.48	34.78	12	3.37	9.28
IX_32_02815	STH 16 & Frontage Rd	LOSS 4	23.19	LOSS 4	5.88	Yes	38	11.41	34.60	12	3.91	9.79
IX_32_02324	STH 35 & Badger St	LOSS 4	22.54	LOSS 4	7.27	Yes	37	9.53	32.07	14	3.11	10.37
IX_32_02221	USH 53 & Pearl St	LOSS 4	22.35	LOSS 4	2.81	Yes	36	6.67	29.02	7	1.94	4.75
IX_32_02224	USH 53 & Main St	LOSS 4	9.57	LOSS 2	-0.73	Yes	35	23.90	33.47	6	7.09	6.36
IX_32_02285	USH 53 & Vine St	LOSS 4	20.83	LOSS 4	3.91	Yes	34	6.54	27.37	9	1.90	5.80
IX_32_02253	USH 53 & State St	LOSS 4	9.51	LOSS 2	-0.25	Yes	33	21.82	31.33	6	6.39	6.14
IX_32_01542	USH 14 & 13th St & Horton St	LOSS 4	14.28	LOSS 4	4.11	Yes	30	13.52	27.80	10	4.46	8.57
IX_32_02015	USH 14 & Market St	LOSS 4	9.12	LOSS 2	-1.83	Yes	28	17.81	26.93	3	5.36	3.53
IX_32_02188	USH 53 & Jay St	LOSS 4	10.92	LOSS 4	2.15	Yes	28	14.12	25.04	8	3.93	6.08
IX_32_02624	USH 53 & Logan St	LOSS 4	10.01	LOSS 4	3.51	Yes	24	12.30	22.31	9	4.20	7.71
IX_32_02414	STH 16 & Bluff Pass Rd	LOSS 4	10.92	LOSS 3	1.79	Yes	23	10.31	21.23	6	3.44	5.23
IX_32_02303	STH 35 & Pine St	LOSS 4	11.05	LOSS 4	3.93	Yes	23	9.53	20.58	9	3.11	7.04
IX_32_02272	STH 35 & Vine St	LOSS 4	11.05	LOSS 3	0.59	Yes	23	9.53	20.58	4	3.11	3.70
IX_32_02177	USH 53 & King St	LOSS 4	9.53	LOSS 2	-0.31	Yes	23	11.79	21.32	3	3.45	3.14
IX_32_02704	STH 35 & Gohres St	LOSS 4	11.54	LOSS 4	2.25	Yes	22	7.05	18.59	6	2.07	4.32
IX_32_02606	USH 53 & Gold St	LOSS 4	11.47	LOSS 4	2.82	Yes	22	8.18	19.65	7	2.56	5.38
IX_32_02512	USH 53 & Saint Cloud St	LOSS 4	10.55	LOSS 3	1.43	Yes	22	9.01	19.56	5	2.77	4.20
IX_32_02915	STH 16 & Ramp 12th Ave to STH 16 (1) &	LOSS 4	10.11	LOSS 2	-0.45	Yes	21	8.47	18.58	1	1.86	1.41
IX_32_02350	STH 16 & 11th St	LOSS 4	10.56	LOSS 3	0.75	Yes	20	5.23	15.80	3	1.46	2.20
IX_32_02334	USH 53 & Badger St	LOSS 4	11.26	LOSS 4	2.08	Yes	20	3.88	15.14	6	1.07	3.15
IX_32_02351	STH 16 & 10th St	LOSS 4	9.85	LOSS 3	0.26	Yes	19	5.23	15.08	2	1.46	1.72
IX_32_02362	STH 16 & Oakland St	LOSS 4	9.56	LOSS 4	2.79	Yes	19	6.26	15.82	7	1.80	4.59
IX_32_01423	USH 14 & 17th St	LOSS 4	9.25	LOSS 4	1.61	Yes	19	7.75	17.00	5	2.39	4.01
IX_32_02354	STH 16 & 9th St	LOSS 4	9.13	LOSS 3	0.26	Yes	18	5.23	14.37	2	1.46	1.72
IX_32_02641	STH 35 & Sill St	LOSS 4	6.77	LOSS 4	2.62	Yes	18	9.79	16.56	7	3.05	5.67
IX_32_02377	STH 16 & Hillview Ave & Myrick Park Ln	LOSS 4	8.06	LOSS 3	0.64	Yes	17	6.26	14.32	3	1.80	2.45
IX_32_02373	STH 16 & Myrick Park Dr (2)	LOSS 4	9.16	LOSS 4	1.63	Yes	17	3.75	12.91	5	1.02	2.66
IX_32_02864	STH 35 & George St	LOSS 4	5.07	LOSS 2	-0.59	Yes	17	10.50	15.57	2	3.06	2.47
IX_32_02495	USH 53 & Hagar St	LOSS 4	6.49	LOSS 4	2.71	Yes	17	9.01	15.50	7	2.77	5.48
IX_32_02559	USH 53 & Windsor St	LOSS 4	6.80	LOSS 3	0.88	Yes	17	8.54	15.34	4	2.60	3.47
IX_32_02460	STH 35 & Island St	LOSS 4	5.75	LOSS 3	0.09	Yes	16	8.90	14.65	3	2.87	2.95
IX_32_02074	USH 14 & Division St	LOSS 4	6.17	LOSS 2	-0.31	Yes	16	8.28	14.45	2	2.50	2.19
IX_32_02207	USH 53 & Pearl St	LOSS 4	8.45	LOSS 2	-0.06	Yes	16	4.09	12.54	1	1.15	1.08
IX_32_02678	STH 35 & Rublee St	LOSS 4	6.14	LOSS 2	-0.04	Yes	15	7.05	13.19	2	2.07	2.03
IX_32_02076	USH 14 & Division St	LOSS 4	5.83	LOSS 3	1.04	Yes	15	7.57	13.40	4	2.25	3.29
IX_32_02382	STH 16 & 24th St	LOSS 4	6.89	LOSS 4	1.27	Yes	14	4.61	11.50	4	1.31	2.58
IX_32_02291	USH 53 & Vine St	LOSS 4	4.88	LOSS 2	-0.81	Yes	14	7.82	12.70	1	2.34	1.53
IX_32_02730	STH 35 & Livingston St	LOSS 4	4.60	LOSS 4	1.68	Yes	13	7.05	11.64	5	2.07	3.74
IX_32_02577	USH 53 & Saint Paul St	LOSS 4	5.70	LOSS 3	0.16	Yes	13	5.60	11.30	2	1.71	1.86
IX_32_02493	STH 35 & Hagar St	LOSS 4	4.08	LOSS 4	1.77	Yes	11	5.73	9.81	5	1.63	3.40
IX_32_02534	USH 53 & Saint James St	LOSS 4	4.16	LOSS 3	0.69	Yes	11	5.60	9.76	3	1.71	2.40
IX_32_02381	STH 16 & 23rd St	LOSS 4	4.32	LOSS 3	0.40	Yes	10	3.75	8.07	2	1.02	1.42
IX_32_02829	STH 35 & Cunningham St	LOSS 3	1.88	LOSS 4	1.16	Yes	9	6.53	8.40	4	1.89	3.05
IX_32_01873	USH 14 & Adams St	LOSS 3	1.10	LOSS 4	1.16	Yes	8	6.55	7.65	4	1.90	3.05
IX_32_02319	USH 53 & Pine St	LOSS 3	1.64	LOSS 4	0.78	Yes	7	4.79	6.43	3	1.40	2.18
IX_32_02378	STH 16 & 22nd St	LOSS 3	0.87	LOSS 4	0.81	Yes	5	3.75	4.61	3	1.02	1.84
IX_32_02383	STH 16 & 24th St	LOSS 3	0.85	LOSS 4	0.81	Yes	5	3.78	4.62	3	1.03	1.85



Crash Location (# of crashes)

1) WIS 35 & Cunningham St. (1)
2) WIS 35 & Livingston St. (1)
3) WIS 35 near Livingston St. (1)
4) WIS 35 near North St. (1)
5) WIS 35 near Gohres St. (1)
6) WIS 35 & Gillette St. (1)
7) US 53 & Gillette St. (1)
8) WIS 35 & Sill St. (1)
9) US 53 & Logan St. (4)
10) WIS 35 & Logan St. (1)
11) US 53 at Perkins Driveway (1)
12) US 53 & Gold St. (1)
13) US 53 & Clinton St. (1)
14) US 53 (SB) near Wall St. (1)
15) US 53 (SB) & St. James St. (1)
16) WIS 35 & Hagar St. (1)
17) WIS 35 & St. Andrews St. (1)
18) US 53 (SB) near Island St. (1)
19) US 53 & Causeway Blvd. (1)
20) US 53 near River Bend Rd. (1)
21) US 53 & River Bend Rd. (1)
22) WIS 16 & Quarry Rd. (1)
23) WIS 16 & La Crosse St. (1)
24) WIS 16 & 23rd St. (2)
25) WIS 16 & 22nd St. (1)
26) WIS 16 & Hillview Ave. (4)
27) WIS 16 & Myrick Park Ln. (1)
28) WIS 16 near Myrick Park Dr. (1)
29) WIS 16 & East Ave (1)
30) WIS 16 & Oakland St. (6)
31) WIS 16 & WIS 35 (West Ave) (6)
32) WIS 16 & 11th St. (2)
33) US 53 & La Crosse St. (5)
34) WIS 16 & 10th St. (1)
35) WIS 35 & Badger St. (11)
36) US 53 (NB) & Badger St. (2)
37) WIS 35 & Pine St. (12)
38) US 53 (NB) near Vine St. (2)
39) US 53 (NB) & Vine St. (10)
40) WIS 35 & Vine St. (7)
41) US 53 (SB) & State St. (1)
42) US 53 (SB) & Main St. (2)
43) WIS 35 & State St. (9)
44) US 53 (NB) & Main St. (1)
45) US 53 (SB) & Pearl St. (12)
46) Losey Blvd. & Main St. (1)
47) WIS 35 & Main St. (2)
48) US 53 (NB) & Pearl St. (3)
49) US 53 (NB) & Jay St. (4)
50) US 53 (SB) & Jay St. (4)
51) US 53 (NB) near Jay St. (1)
52) US 53 (NB) & King St. (3)
53) WIS 35 & Cass St. (4)
54) WIS 35 & Market St. (1)
55) US 14 (SB) near Market St. (1)
56) US 14 (SB) near Jackson St. (1)
57) US 14 (NB) & Jackson St. (1)
58) WIS 35 & WIS 33 (2)
59) Losey Blvd. & WIS 33 (4)
60) US 14 & 7th St. (1)
61) Losey Blvd. & Redfield St. (2)
62) US 14 at Hospital Mid-Block Xwalk (7)
63) Losey Blvd. & Green Bay St. (2)
64) WIS 35 & Green Bay St. (1)
65) Losey Blvd. & Travis St. (4)
66) Losey Blvd. & Barlow St. (1)
67) Losey Blvd. & Weston St. (1)
68) US 14 & WIS 35 (West Ave) (1)
69) US 14 & 13th St. (2)
70) Losey Blvd. near Chase St. (1)
71) Losey Blvd. & Thompson St. (1)
72) US 14 & 16th St. (1)
73) US 14 & Ward Ave. (2)
74) Losey Blvd. near Ward Ave. (1)
75) US 14 & Victory St. (1)
76) US 14 & Losey Blvd. (1)

Legend

Project Segments

Pedestrian Crashes (2014-2018)
(Data includes near miss pedestrian crashes)

- *6+ crashes*
- *2 to 5 crashes*
- *1 crash*

Intersection Type

- *Signalized*
- *Two-Way Stop Controlled*
- *Non-intersection Crash*

Pedestrian Crash Facts:

- **187 crashes** involving pedestrians
- **118 crashes** were near miss incidents for pedestrians, but caused vehicle collisions
- **55% of crashes** resulted in injury or death (21% possible injury)
- **88% of crashes** occurred at intersections

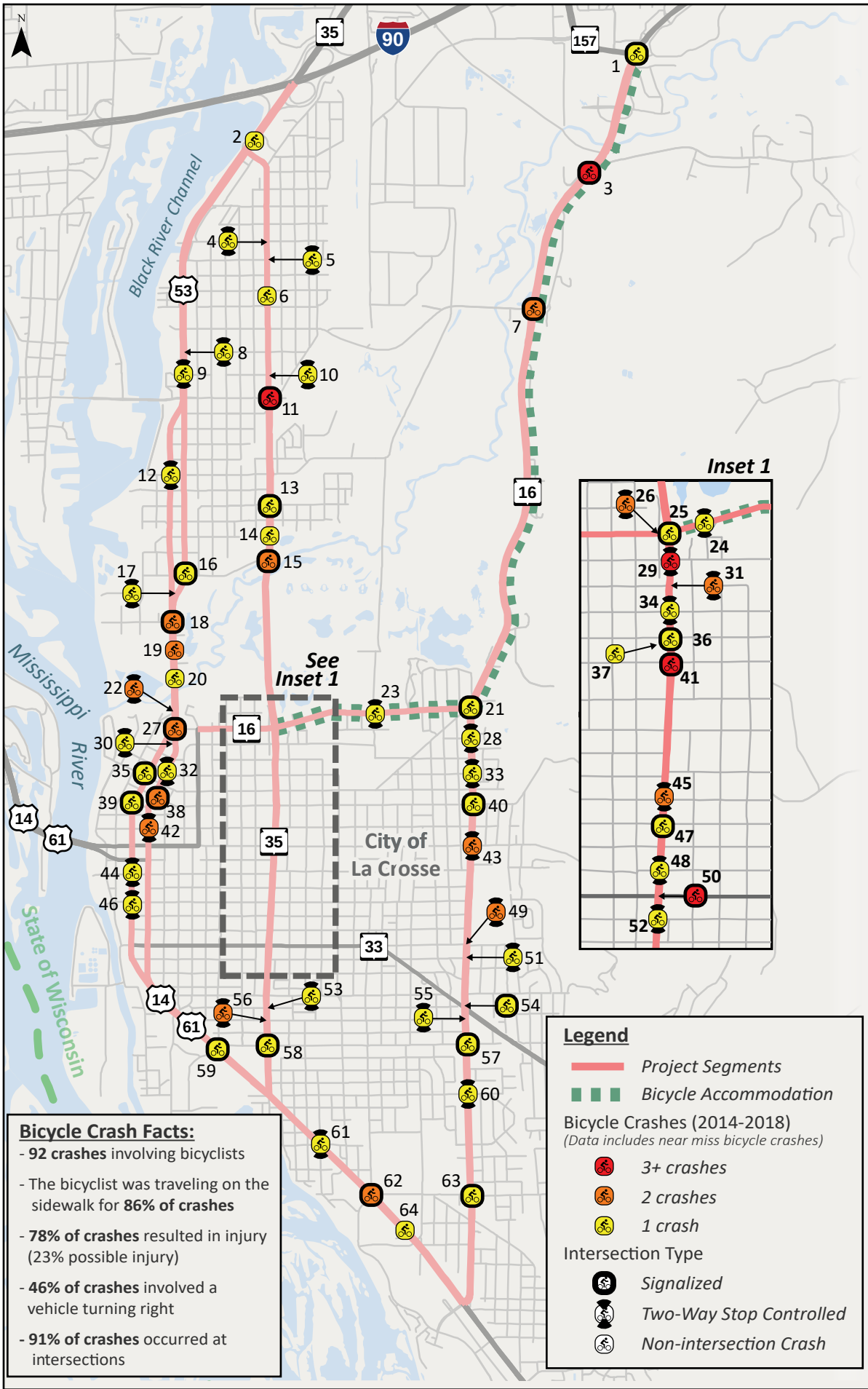
Pedestrian Crash Locations

La Crosse Safety and Operations Study

December 2021

WisDOT ID: 1630-08-00

WISCONSIN DEPARTMENT OF TRANSPORTATION



Crash Location (# of crashes)

1) WIS 16 & WIS 157 (1)
2) US 53 near WIS 35 (1)
3) WIS 16 & County B (3)
4) WIS 35 & Moore St. (1)
5) WIS 35 & Livingston St. (1)
6) WIS 35 near Gohres St. (1)
7) WIS 16 & County B/Gillette St. (2)
8) US 53 & Sill St. (1)
9) US 53 at Perkins Driveway (1)
10) WIS 35 & Logan St. (1)
11) WIS 35 & Clinton St. (5)
12) US 53 (SB) & St. Cloud St. (1)
13) WIS 35 & St. Andrews St. (1)
14) WIS 35 near Monitor St. (1)
15) WIS 35 & Monitor St. (2)
16) US 53 (NB) & Monitor St. (1)
17) US 53 (SB) & Buchner Pl. (1)
18) US 53 & Causeway Blvd. (2)
19) US 53 near Marsh Ln. (2)
20) US 53 near River Bend Rd. (1)
21) WIS 16 & La Crosse St. (1)
22) US 53 & 2nd St. (2)
23) WIS 16 & East Ave. (1)
24) WIS 16 & Oakland St. (1)
25) WIS 16 & WIS 35 (1)
26) WIS 16 & 12th St. (2)
27) US 53 & La Crosse St. (2)
28) Losey Blvd. & Crowley Pl. (1)
29) WIS 35 & Badger St. (5)
30) US 53 (NB) & Badger St. (1)
31) WIS 35 & Pine St. (2)
32) US 53 (NB) & Vine St. (1)
33) Losey Blvd. & Vine St. (1)
34) WIS 35 & Vine St. (1)
35) US 53 (SB) & State St. (1)
36) WIS 35 & State St. (1)
37) WIS 35 near State St. (1)
38) US 53 (NB) & Main St. (2)
39) US 53 (SB) & Pearl St. (1)
40) Losey Blvd. & Main St. (1)
41) WIS 35 & Main St. (3)
42) US 53 (NB) & King St. (2)
43) Losey Blvd. & Cass St. (2)
44) US 14 (SB) & Division St. (1)
45) WIS 35 & Ferry St. (2)
46) US 14 (SB) & Market St. (1)
47) WIS 35 & Market St. (1)
48) WIS 35 & Mississippi St. (1)
49) Losey Blvd. & Jackson St. (2)
50) WIS 35 & WIS 33 (3)
51) Losey Blvd. & Johnson St. (1)
52) WIS 35 & Johnson St. (1)
53) WIS 35 & Park Ave. (1)
54) Losey Blvd. & WIS 33 (1)
55) Losey Blvd. & Denton St. (1)
56) WIS 35 & Denton St. (2)
57) Losey Blvd. & Green Bay St. (1)
58) WIS 35 & Green Bay St. (1)
59) US 14 & Green Bay St. (1)
60) Losey Blvd. & Weston St. (1)
61) US 14 & 15th St. (1)
62) US 14 & Ward Ave. (2)
63) Losey Blvd. & Ward Ave. (1)
64) US 14 near Victory St. (1)

Legend

- *Project Segments*
- *Bicycle Accommodation*

Bicycle Crashes (2014-2018)
(Data includes near miss bicycle crashes)

- *3+ crashes*
- *2 crashes*
- *1 crash*

Intersection Type

- *Signalized*
- *Two-Way Stop Controlled*
- *Non-intersection Crash*

0 0.5 1 Miles

Bicycle Crash Facts:

- **92 crashes** involving bicyclists
- The bicyclist was traveling on the sidewalk for **86% of crashes**
- **78% of crashes** resulted in injury (23% possible injury)
- **46% of crashes** involved a vehicle turning right
- **91% of crashes** occurred at intersections

Bicycle Crash Locations

La Crosse Safety and Operations Study

December 2021

WisDOT ID: 1630-08-00

WISCONSIN DEPARTMENT OF TRANSPORTATION

Intersection Crashes by Corridor

Segment	Intersection ID	Intersection Name	Crashes After Vetting	Crash Severity						Crash Type										
				K	A	B	C	PD	Total KAB	Angle	Head	Mainline Left Turn	Side Road Left Turn	Mainline Rear End	Side Road Rear End	Lane Departure	Sideswipe	Bike	Ped	Bike/Ped Near Miss
WIS 16 (La Crosse St) 7th St to Losey Blvd	IX_32_02357	WIS 16 & WIS 35	83	0	0	7	18	58	7	2	0	7	2	22	24	10	9	0	5	2
	Not Flagged	WIS 16 & East Ave	43	0	0	4	7	32	4	0	0	0	0	37	0	4	0	1	1	0
	IX_32_02352	WIS 16 & 12th St	32	0	0	3	4	25	3	8	0	10	0	11	0	0	1	2	0	0
	IX_32_02362	WIS 16 & Oakland St	15	0	1	1	3	10	2	3	0	0	0	2	0	0	3	1	1	5
	IX_32_02377	WIS 16 & Hillview Ave	11	0	0	1	2	8	1	0	0	0	0	7	0	0	0	0	0	4
	IX_32_02373	WIS 16 & Myrick Park Dr	10	0	0	1	3	6	1	0	0	0	0	7	1	1	0	0	0	1
	IX_32_02381	WIS 16 & 23rd St	10	0	0	0	2	8	0	0	0	0	0	7	0	0	1	0	0	2
	Not Flagged	WIS 16 & 7th St	10	0	1	0	0	9	1	2	0	1	0	5	0	1	1	0	0	0
	IX_32_02350	WIS 16 & 11th St	8	0	0	0	2	6	0	2	0	0	0	3	0	0	1	0	0	2
	IX_32_02382	WIS 16 & 24th St (S Leg)	8	0	1	1	1	5	2	1	0	0	0	6	0	1	0	0	0	0
	IX_32_02351	WIS 16 & 10th St	6	0	0	0	1	5	0	2	0	0	0	3	0	0	0	0	0	1
	IX_32_02354	WIS 16 & 9th St	6	0	0	0	0	6	0	3	0	0	0	0	0	1	2	0	0	0
	IX_32_02378	WIS 16 & 22nd St	5	0	0	0	3	2	0	0	0	0	0	4	0	0	0	0	0	1
	Not Flagged	WIS 16 & 16th St	4	0	0	1	2	1	1	0	0	0	0	4	0	0	0	0	0	0
	IX_32_02383	WIS 16 & 24th St (N Leg)	2	0	0	0	1	1	0	0	0	0	0	2	0	0	0	0	0	0
	Not Flagged	WIS 16 & N 22nd St	2	0	0	0	1	1	0	0	0	0	0	2	0	0	0	0	0	0
	Not Flagged	WIS 16 & 17th St	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
	Not Flagged	WIS 16 & 8th St	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0
WIS 35 (Lang Dr, George St) WIS 16 (La Crosse St) to US 53	Not Flagged	WIS 35 & Gillette St	37	0	1	7	2	27	8	12	0	8	1	9	2	1	3	0	0	1
	Not Flagged	WIS 35 & Clinton St	34	0	0	6	6	22	6	5	0	0	0	10	2	9	3	5	0	0
	Not Flagged	WIS 35 & Monitor St	16	0	0	4	2	10	4	1	0	5	1	4	0	2	1	2	0	0
	Not Flagged	WIS 35 & St Andrew St	14	0	0	3	1	10	3	2	0	2	0	5	1	1	1	1	1	0
	IX_32_02864	WIS 35 & George St	13	0	0	1	1	11	1	3	0	1	1	0	3	3	2	0	0	0
	IX_32_02641	WIS 35 & Sill St	8	0	1	0	3	4	1	2	0	1	2	2	0	0	0	0	0	1
	IX_32_02704	WIS 35 & Gohres St	8	0	0	1	1	6	1	2	1	0	2	3	0	0	0	0	0	0
	IX_32_02730	WIS 35 & Livingston St	8	0	0	2	1	5	2	0	0	0	1	4	0	0	1	1	0	1
	Not Flagged	WIS 35 & Logan St	8	0	1	2	0	5	3	3	0	1	2	0	0	0	0	1	1	0
	IX_32_02829	WIS 35 & Cunningham St	7	0	0	2	1	4	2	2	0	0	0	2	0	1	1	0	1	0
	IX_32_02493	WIS 35 & Hagar St	6	0	0	2	0	4	2	1	0	0	0	2	1	0	1	0	1	0
	IX_32_02678	WIS 35 & Rublee St	5	0	0	0	0	5	0	0	0	0	1	3	1	0	0	0	0	0
	Not Flagged	WIS 35 & Palace St	5	0	0	2	1	2	2	3	0	0	0	2	0	0	0	0	0	0
	IX_32_02460	WIS 35 & Island St	4	0	0	0	0	4	0	0	0	0	0	1	0	1	2	0	0	0
	Not Flagged	WIS 35 & Moore St	4	0	0	2	0	2	2	1	0	0	0	1	0	1	0	1	0	0
	Not Flagged	WIS 35 & North St	3	0	0	0	1	2	0	1	0	0	1	0	0	1	0	0	0	0
	Not Flagged	WIS 35 & Hayes St	2	0	0	0	1	1	0	1	0	0	0	1	0	0	0	0	0	0
	Not Flagged	WIS 35 & Mississippi St	2	0	0	1	0	1	1	0	0	0	0	0	0	0	1	1	0	0
US 53 (Rose St, Copeland Ave) La Crosse St to I-90	Not Flagged	US 53 & La Crosse St	67	0	0	3	9	55	3	7	0	1	4	27	8	10	3	1	3	3
	Not Flagged	US 53 & WIS 35	58	1	0	4	9	44	5	2	0	5	0	22	23	4	2	0	0	0
	Not Flagged	US 53 & Clinton St	47	0	0	7	9	31	7	4	0	6	3	22	5	3	3	0	1	0
	Not Flagged	US 53 & Monitor St	23	0	0	1	1	21	1	5	0	0	6	4	2	2	3	1	0	0
	Not Flagged	US 53 & Riverbend Rd (North)	20	0	1	3	3	13	4	4	0	1	0	11	1	1	1	0	1	0
	IX_32_02512	US 53 & Saint Cloud St	15	0	0	2	1	12	2	2	1	0	4	1	0	0	6	0	0	1
	IX_32_02495	US 53 & Hagar St	10	0	0	2	1	7	2	1	0	0	2	0	0	0	7	0	0	0
	Not Flagged	US 53 & Causeway Blvd	10	0	3	0	1	6	3	1	0	0	0	3	0	2	1	2	1	0
	IX_32_02534	US 53 & Saint James St	8	0	0	1	2	5	1	0	0	0	0	0	0	0	7	0	1	0
	IX_32_02624	US 53 & Logan St	8	0	0	4	1	3	4	3	0	0	0	1	0	0	0	0	3	1
	IX_32_02606	US 53 & Gold St	6	0	0	1	0	5	1	0	0	2	0	1	0	1	1	0	0	1
	Not Flagged	US 53 & Gillette St	4	0	0	2	0	2	2	0	0	0	1	2	0	0	0	0	0	1
	IX_32_02559	US 53 & Windsor St	3	0	1	0	0	2	1	2	0	0	0	0	0	0	1	0	0	0
	Not Flagged	US 53 & 2nd St	2	0	0	1	0	1	1	0	0	0	0	0	0	0	0	2	0	0
	Not Flagged	US 53 & Marsh Ln	2	0	1	1	0	0	2	0	0	0	0	0	0	0	0	2	0	0
	Not Flagged	US 53 & Sill St	2	0	0	1	0	1	1	0	0	0	0	0	0	1	0	1	0	0
	Not Flagged	US 53 & Wall St	2	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	0	0
	Not Flagged	US 53 & Buchner Pl	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0
	IX_32_02577	US 53 & Saint Paul St	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Legend

Intersection that was not flagged in the Intersection Network Screening Tool, but was a intersection along a flagged segment in the SCM tool.

Intersection Crashes by Corridor

Segment	Intersection ID	Intersection Name	Crashes After Vetting	Crash Severity						Crash Type										
				K	A	B	C	PD	Total KAB	Angle	Head	Mainline Left Turn	Side Road Left Turn	Mainline Rear End	Side Road Rear End	Lane Departure	Sideswipe	Bike	Ped	Bike/Ped Near Miss
WIS 16 La Crosse St to WIS 157	IX_32_02666	WIS 16 & County B/Gillette St	119	0	3	16	15	85	19	1	0	1	0	83	12	11	9	2	0	0
	IX_32_03005	WIS 16 & WIS 157	100	0	1	6	18	75	7	4	0	3	6	48	19	4	15	1	0	0
	Not Flagged	WIS 16 & County B/Conoco Dr	67	0	1	8	10	48	9	4	0	1	2	44	4	4	5	3	0	0
	IX_32_02404	WIS 16 & Quarry Rd	46	0	0	3	10	33	3	0	0	0	0	41	1	0	3	0	0	1
	IX_32_02815	WIS 16 & Frontage Rd	35	0	0	3	9	23	3	3	0	2	0	25	1	1	3	0	0	0
	IX_32_02414	WIS 16 & Bluff Pass Rd	17	0	1	2	2	12	3	0	2	0	0	12	0	3	0	0	0	0
	Not Flagged	WIS 16 & La Crosse St	16	0	0	2	3	11	2	0	0	0	0	7	4	1	2	1	0	1
	Not Flagged	WIS 16 & Vista Ct	3	0	0	0	1	2	0	0	0	0	0	3	0	0	0	0	0	0
	IX_32_02915	WIS 16 & 12th Ave	3	0	0	0	0	3	0	0	0	0	0	0	0	3	0	0	0	0
	IX_32_02915	WIS 16 & Medary Ln	2	0	0	0	0	2	0	0	0	0	0	0	1	1	0	0	0	0
Losey Blvd US 14 to WIS 16	Not Flagged	Losey Blvd & Green Bay St	51	0	1	4	10	36	5	9	0	3	0	28	3	3	2	1	1	1
	Not Flagged	Losey Blvd & WIS 33	35	0	0	6	3	26	6	3	0	3	1	12	7	1	3	1	3	1
	Not Flagged	Losey Blvd & Ward Ave	13	0	0	1	1	11	1	2	1	1	0	2	3	3	0	1	0	0
	Not Flagged	Losey Blvd & Weston St	9	0	0	1	1	7	1	5	0	0	0	0	0	2	0	1	0	1
	Not Flagged	Losey Blvd & Redfield St	6	0	0	2	1	3	2	2	0	2	0	0	0	0	0	0	1	1
	Not Flagged	Losey Blvd & Denton St	5	0	0	1	1	3	1	2	0	0	0	1	0	0	1	1	0	0
	Not Flagged	Losey Blvd & Travis St	4	0	1	0	1	2	1	0	0	0	0	0	0	0	0	0	1	3
	Not Flagged	Losey Blvd & Cass St.	2	0	0	1	1	0	1	0	0	0	0	0	0	0	0	2	0	0
	Not Flagged	Losey Blvd & Jackson St	2	0	0	2	0	0	2	0	0	0	0	0	0	0	0	2	0	0
	Not Flagged	Losey Blvd & Main St.	2	0	1	0	0	1	1	0	0	0	0	0	0	0	0	1	1	0
	Not Flagged	Losey Blvd & Barlow St	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
	Not Flagged	Losey Blvd & Chase St	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
	Not Flagged	Losey Blvd & Crowley Pl.	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
	Not Flagged	Losey Blvd & Farnam St	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
	Not Flagged	Losey Blvd & Johnson St.	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0
	Not Flagged	Losey Blvd & Thompson St	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
	Not Flagged	Losey Blvd & Vine St	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0
WIS 35 (West Ave) US 14/61 (South Ave) to WIS 16 (La Crosse St)	IX_32_01928	WIS 33 & WIS 35	72	0	0	6	13	53	6	9	0	7	7	20	10	6	8	3	1	1
	IX_32_02241	WIS 35 & State St	47	0	1	6	9	31	7	5	0	1	3	24	0	1	3	1	2	7
	Not Flagged	WIS 35 & Cass St	39	0	0	5	8	26	5	9	0	2	1	13	7	2	1	0	1	3
	Not Flagged	WIS 35 & Main St	27	0	0	5	0	22	5	3	0	1	0	11	1	3	3	3	1	1
	IX_32_02324	WIS 35 & Badger St	24	0	0	6	5	13	6	1	0	0	0	5	0	1	1	4	2	10
	IX_32_02272	WIS 35 & Vine St	22	0	1	1	2	18	2	8	0	0	2	4	0	0	0	0	1	7
	IX_32_02303	WIS 35 & Pine St	20	0	0	3	5	12	3	0	0	0	0	5	0	0	1	2	1	11
	Not Flagged	WIS 35 & Green Bay St	19	0	2	3	2	12	5	7	0	0	0	8	0	1	1	1	1	0
	Not Flagged	WIS 35 & Market St	17	0	0	1	4	12	1	5	0	1	0	3	2	2	2	1	1	0
	Not Flagged	WIS 35 & King St	10	0	0	3	1	6	3	4	0	2	0	1	1	0	2	0	0	0
	Not Flagged	WIS 35 & Farnam St	9	0	0	2	1	6	2	4	0	1	0	1	1	1	1	0	0	0
	Not Flagged	WIS 35 & Adams St	7	0	0	0	0	7	0	1	0	0	0	2	1	0	3	0	0	0
	Not Flagged	WIS 35 & Denton St	7	0	0	2	1	4	2	3	0	0	0	2	0	0	0	2	0	0
	Not Flagged	WIS 35 & Park Ave	4	0	0	1	0	3	1	0	0	2	0	1	0	0	0	1	0	0
	Not Flagged	WIS 35 & Redfield St	3	0	0	0	1	2	0	1	0	1	0	1	0	0	0	0	0	0
	Not Flagged	WIS 35 & Cameron Ave	2	0	0	0	0	2	0	1	0	0	0	0	1	0	0	0	0	0
	Not Flagged	WIS 35 & Ferry St	2	0	1	1	0	0	2	0	0	0	0	0	0	0	0	2	0	0
	Not Flagged	WIS 35 & Campbell St	1	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0
	Not Flagged	WIS 35 & Johnson St	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0
	Not Flagged	WIS 35 & Winnebago St	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0

Legend

Intersection that was not flagged in the Intersection Network Screening Tool, but was a intersection along a flagged segment in the SCM tool.

Intersection Crashes by Corridor

Segment	Intersection ID	Intersection Name	Crashes After Vetting	Crash Severity						Crash Type										
				K	A	B	C	PD	Total KAB	Angle	Head	Mainline Left Turn	Side Road Left Turn	Mainline Rear End	Side Road Rear End	Lane Departure	Sideswipe	Bike	Ped	Bike/Ped Near Miss
4th St (US 14/61/53) Hood St to La Crosse St	IX_32_02188	US 53 NB & Jay St	26	0	0	3	4	19	3	3	0	0	2	6	1	0	10	0	3	1
	IX_32_02285	US 53 NB & Vine St	24	0	0	2	8	14	2	3	0	0	2	2	1	0	5	1	2	8
	IX_32_02253	US 53 NB & State St	21	0	0	4	1	16	4	6	0	0	0	5	4	2	4	0	0	0
	Not Flagged	US 53 NB & Cameron Ave	21	0	0	3	1	17	3	13	0	0	0	4	0	4	0	0	0	0
	IX_32_02176	US 53 NB & King St	19	0	0	2	7	10	2	6	0	0	0	0	3	0	5	2	1	2
	IX_32_02224	US 53 NB & Main St	18	0	0	2	2	14	2	3	1	0	0	3	1	0	7	2	1	0
	IX_32_02334	US 53 NB & Badger St	16	0	0	3	2	11	3	1	0	0	0	0	0	0	12	1	0	2
	IX_32_02074	US 14 NB & Division St	14	0	0	1	1	12	1	9	0	0	0	0	1	0	4	0	0	0
	Not Flagged	US 53 NB & Market St	13	0	0	1	3	9	1	8	0	0	0	0	2	0	3	0	0	0
	IX_32_02207	US 53 NB & Pearl St	10	0	0	2	3	5	2	0	0	0	0	1	0	0	6	0	0	3
	Not Flagged	US 53 NB & Cass St	9	0	0	0	0	9	0	1	0	0	0	3	0	0	5	0	0	0
	IX_32_01873	US 14 NB & Adams St	6	0	0	1	1	4	1	4	0	0	0	0	0	2	0	0	0	0
	Not Flagged	US 53 NB & Ferry St	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0
	Not Flagged	US 53 NB & Jackson St	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0
3rd St (US 14/61/53) La Crosse St to Hood St	IX_32_02101	US 14 & US 53	45	0	1	9	9	26	10	21	0	0	0	4	8	3	9	0	0	0
	IX_32_02189	US 53 SB & Jay St	34	0	3	2	2	27	5	3	0	0	2	8	4	1	12	0	3	1
	IX_32_02248	US 53 SB & Main St	30	0	0	5	3	22	5	4	0	0	1	10	2	0	11	0	2	0
	IX_32_02015	US 14 & Market St	26	0	0	1	3	22	1	2	0	0	1	2	3	5	12	1	0	0
	Not Flagged	US 14 SB & Jackson St	21	0	0	5	1	15	5	7	0	0	2	2	0	0	10	0	0	0
	IX_32_02221	US 53 SB & Pearl St	19	0	2	3	3	11	5	2	0	0	0	2	0	0	2	1	5	7
	IX_32_02177	US 53 SB & King St	16	0	1	0	1	14	1	6	0	0	2	1	0	0	7	0	0	0
	Not Flagged	US 53 SB & State St	15	0	0	1	1	13	1	2	0	0	1	7	2	0	2	1	0	0
	IX_32_02076	US 14 SB & Division St	13	0	0	1	2	10	1	2	0	0	0	1	0	0	9	1	0	0
	Not Flagged	US 53 SB & Cass St	7	0	0	0	1	6	0	1	0	0	0	5	0	0	0	1	0	0
	IX_32_02291	US 53 SB & Vine St	6	0	0	1	1	4	1	0	0	0	1	4	1	0	0	0	0	0
	Not Flagged	US 14 SB & Johnson St	2	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	0	0
	IX_32_02319	US 53 SB & Pine St	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
	Not Flagged	US 14 SB & Adams St	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0
	Not Flagged	US 53 SB & Badger St	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0
US 14 (South Ave, Mormon Coulee Rd Hood St to Losey Blvd	IX_32_01572	US 14 & WIS 35 & West Ave S	44	0	0	2	10	32	2	5	0	0	3	19	6	4	6	0	0	1
	Not Flagged	US 14 & 7th St	33	1	1	3	3	25	5	3	0	4	1	11	1	5	7	0	1	0
	Not Flagged	US 14 & Ward Ave	33	0	0	2	6	25	2	3	0	3	3	10	3	4	3	1	0	3
	IX_32_01542	US 14 & 13th St & Horton St	17	0	1	3	1	12	4	6	0	2	0	6	0	0	1	0	1	1
	Not Flagged	US 14 & 16th St	9	0	0	0	0	9	0	0	0	0	5	1	2	0	0	0	0	1
	Not Flagged	US 14 & Green Bay St	6	0	0	4	0	2	4	1	0	0	0	3	1	0	0	1	0	0
	IX_32_01423	US 14 & 17th St	4	0	0	1	0	3	1	2	0	0	0	2	0	0	0	0	0	0
	Not Flagged	US 14 & Victory St & 21st Pl	2	0	0	0	1	1	0	0	0	0	0	2	0	0	0	0	0	0
	Not Flagged	US 14 & 15th St	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0
	Not Flagged	US 14 & Losey Blvd	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0
	Not Flagged	US 14 & Medinger Pl	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
	Not Flagged	US 14 & Thompson St	1	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0
	Not Flagged	US 14 & Victory St	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0

Legend

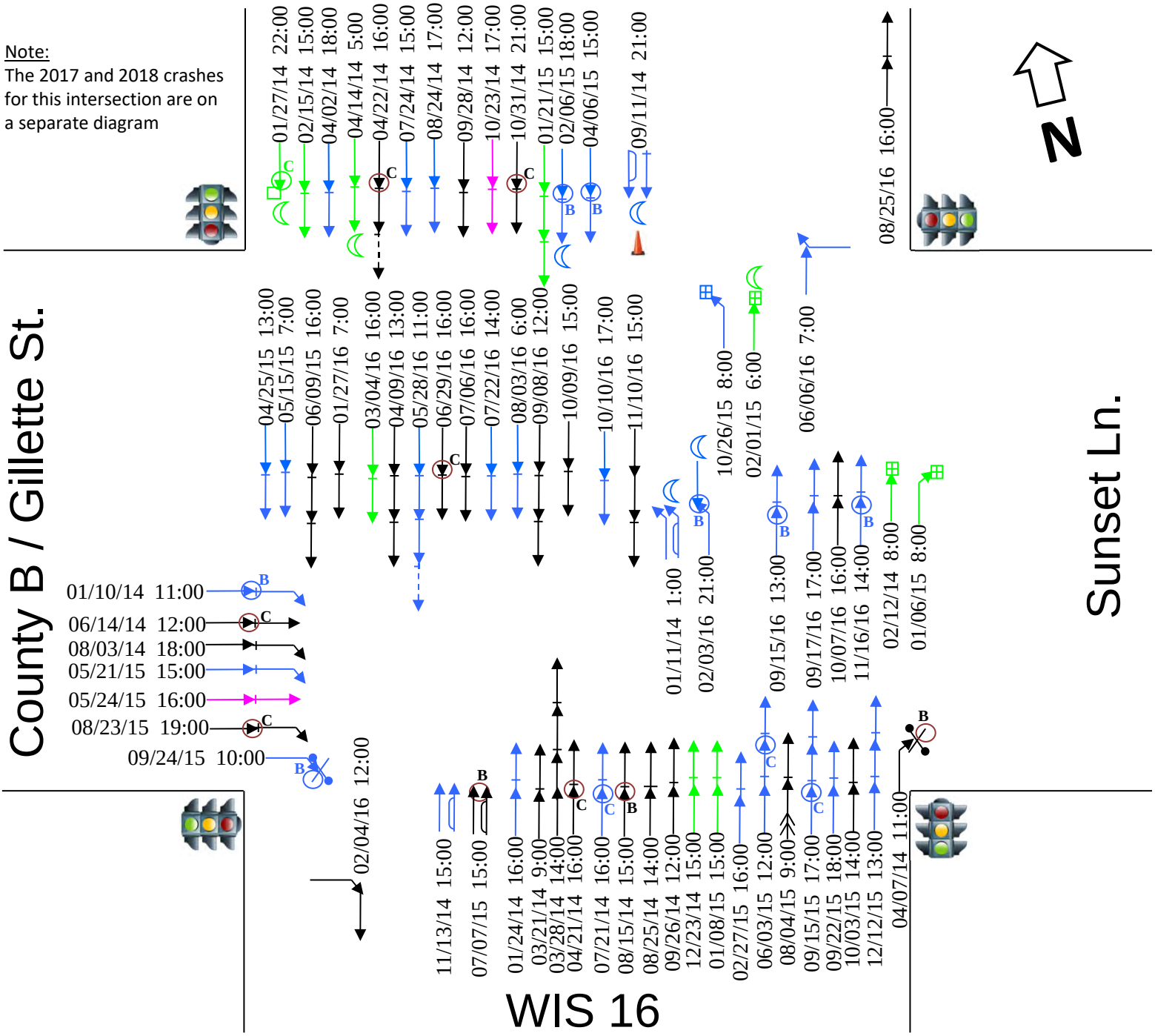
Intersection that was not flagged in the Intersection Network Screening Tool, but was a intersection along a flagged segment in the SCM tool.

Appendix 8: Intersection Crash Diagrams

2014-2016 WIS 16 & Gillette St.

69 Crashes (119 Total Crashes) La Crosse County

Note:
The 2017 and 2018 crashes for this intersection are on a separate diagram

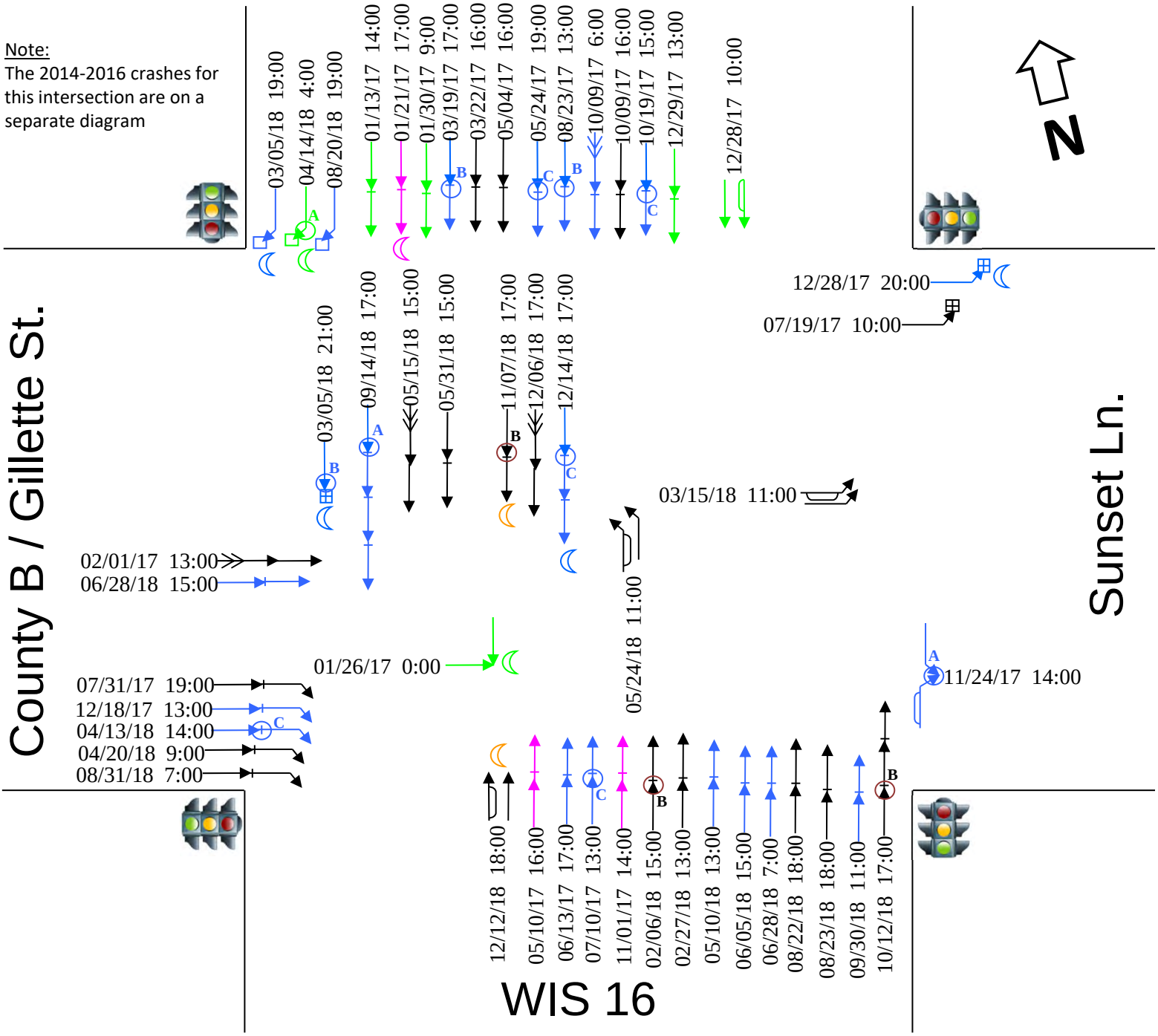


Legend

- Stopped
- Sideswipe
- Backing
- Overtaking
- Non-Contact
- Night
- Fixed Object
- Traffic Signal
- Pedestrian
- Bicyclist
- Injury
- Fatality
- Injury Severity (A, B, C)
- Construction
- Cloudy
- Snow/Ice
- Rain
- Fog/mist

2017-2018 WIS 16 & Gillette St.

50 Crashes (119 Total Crashes) La Crosse County

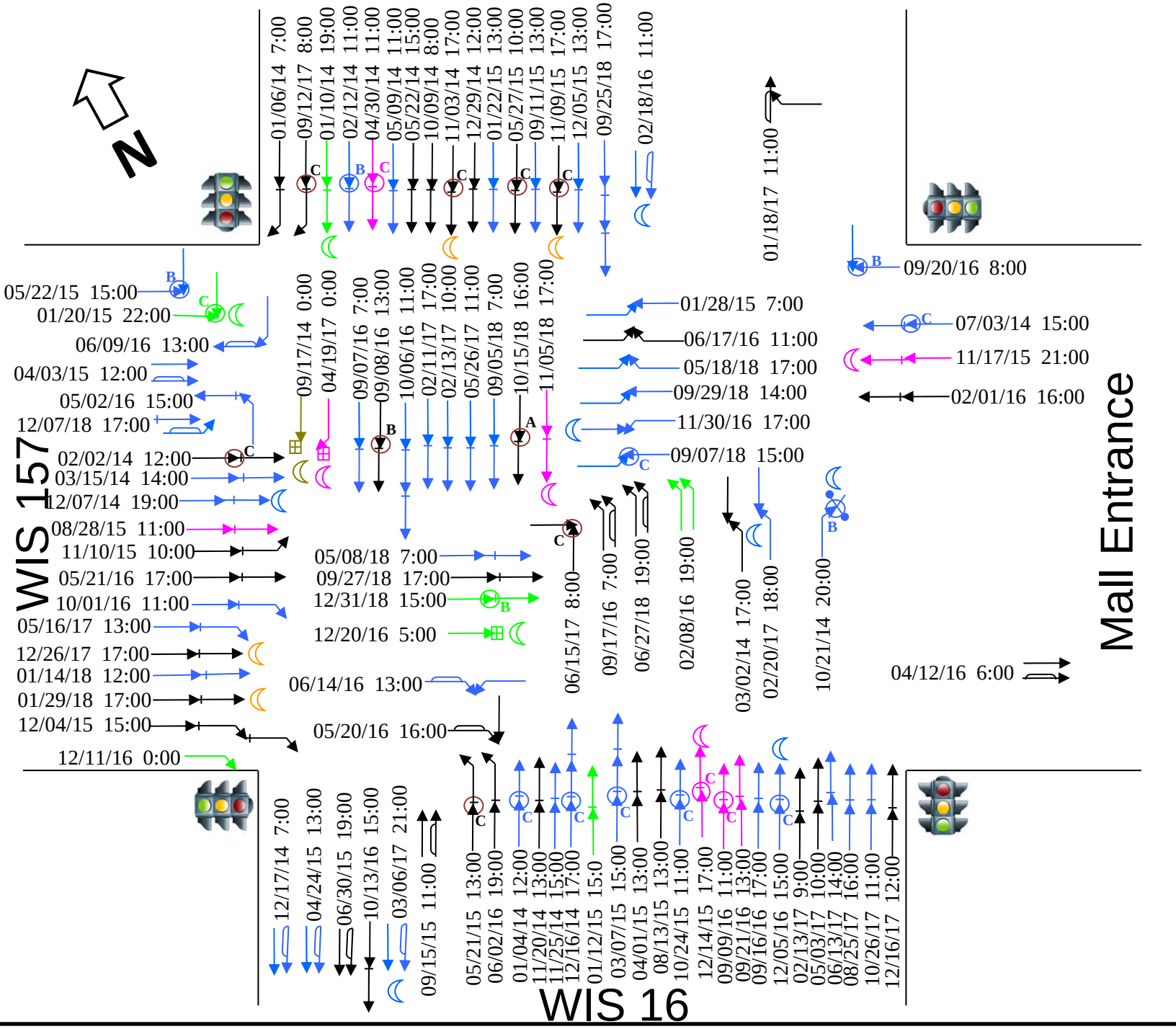


Legend

- Stopped
- Sideswipe
- Backing
- Overtaking
- Non-Contact
- Night
- Fixed Object
- Traffic Signal
- Pedestrian
- Bicyclist
- Injury
- Fatality
- Injury Severity (A, B, C)
- Construction
- Cloudy
- Snow/Ice
- Rain
- Fog/mist

2014-2018 WIS 16 & WIS 157

100 Crashes La Crosse County

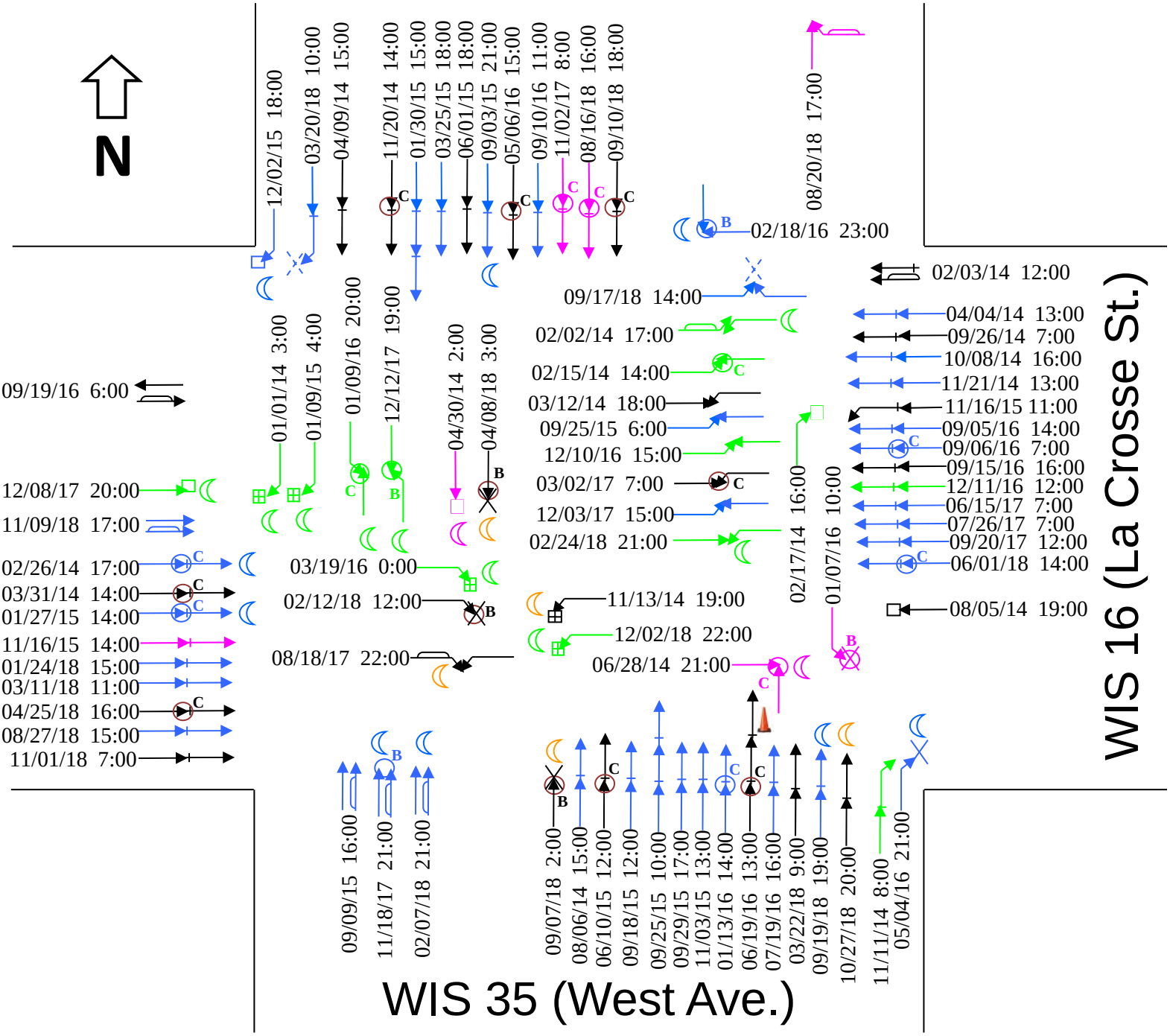


Legend

Stopped	Night	Injury		Cloudy
Sideswipe	Fixed Object	Fatality		Snow/Ice
Backing	Traffic Signal	Injury Severity (A, B, C)		Rain
Overtaking	Pedestrian			Fog/mist
Non-Contact	Bicyclist	Construction		

2014-2018 WIS 35 (West Ave.) & WIS 16 (La Crosse St.)

83 Crashes La Crosse County

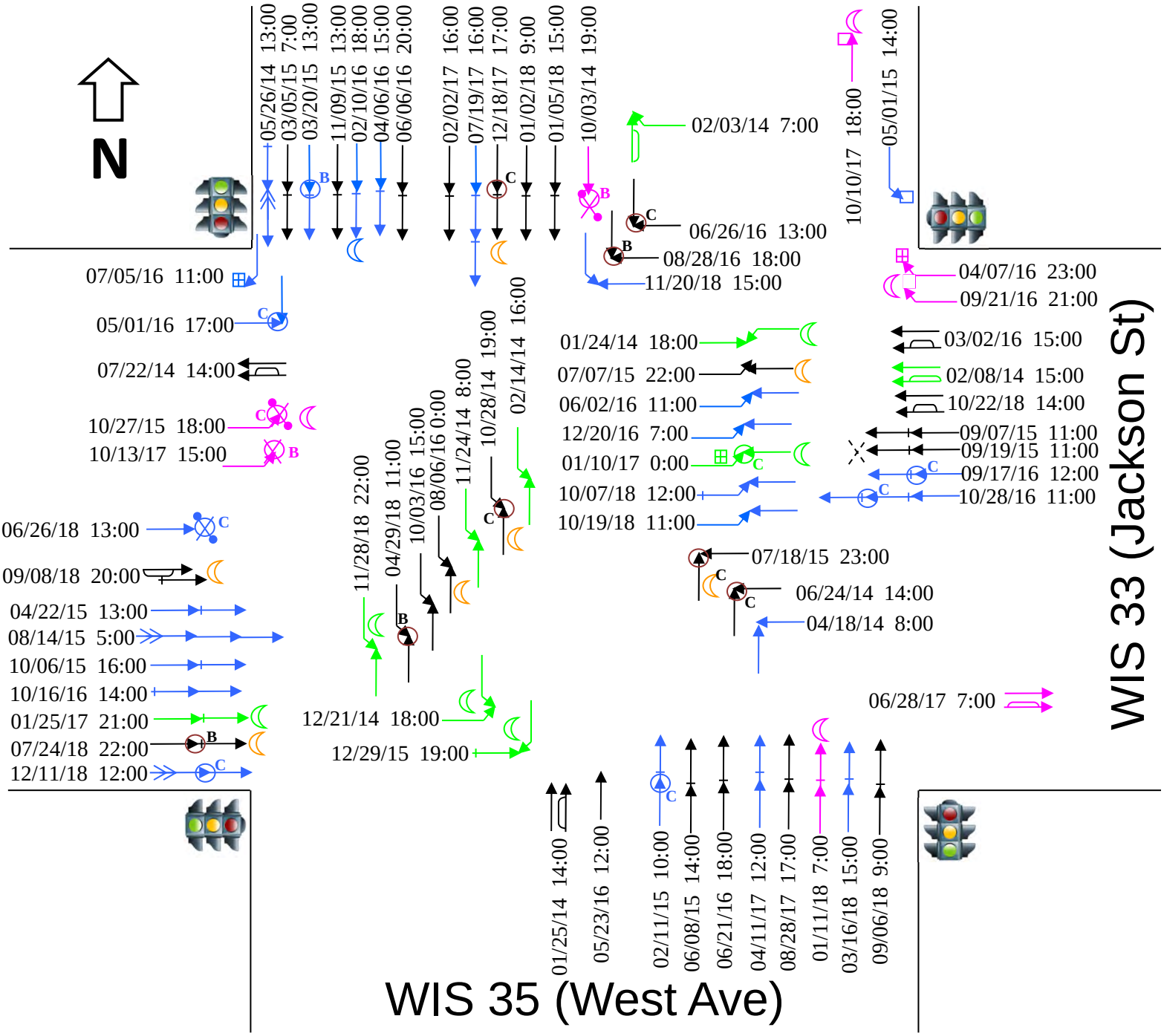


Legend

- Stopped
- Sideswipe
- Backing
- Overtaking
- Non-Contact
- Night
- Fixed Object
- Traffic Signal
- Pedestrian
- Bicyclist
- Injury
- Fatality
- Injury Severity (A, B, C)
- Construction
- Cloudy
- Snow/Ice
- Rain
- Fog/mist

2014-2018 WIS 35 (West Ave.) & WIS 33 (Jackson St.)

72 Crashes La Crosse County

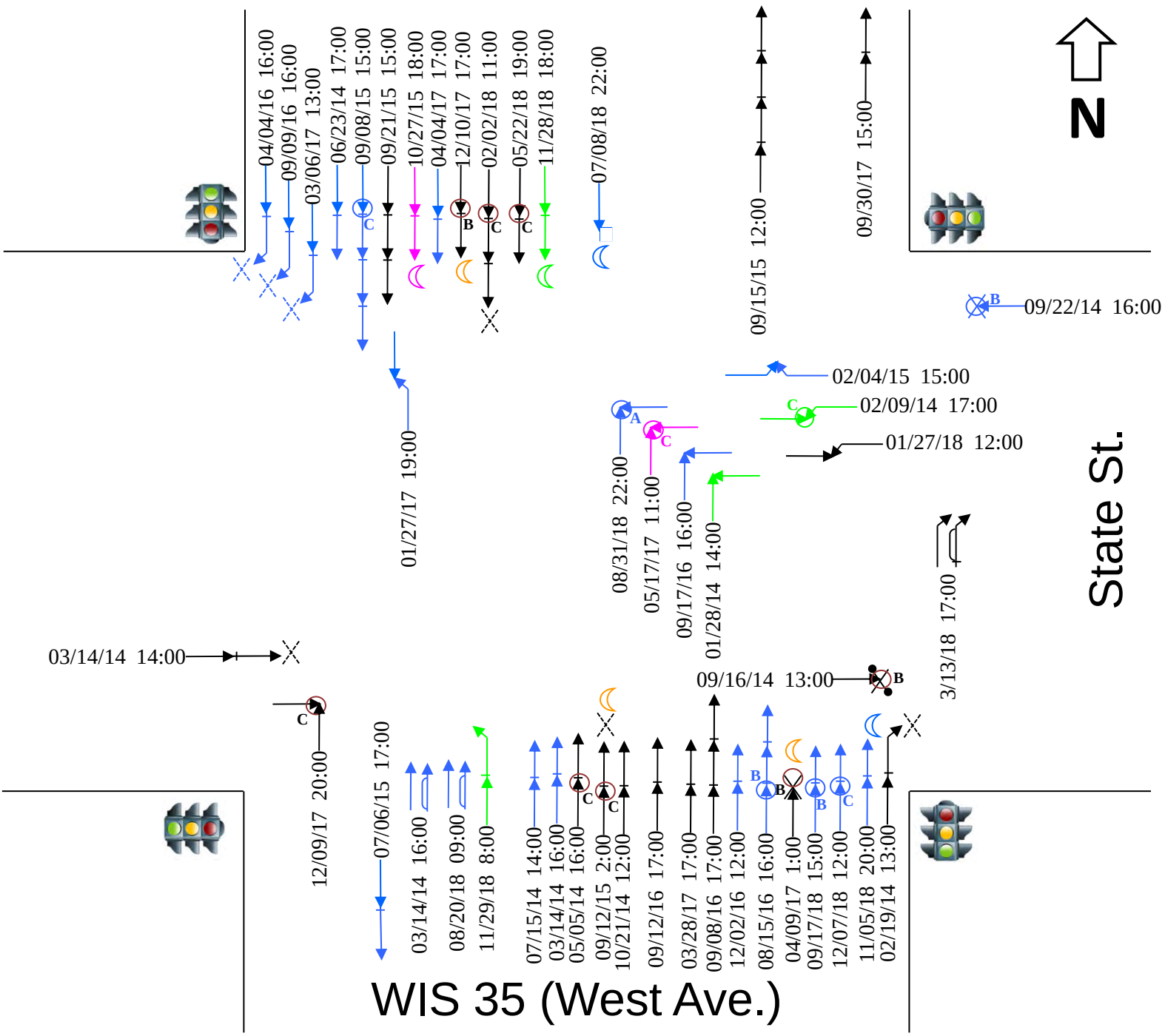


Legend

- Stopped
- Sideswipe
- Backing
- Overtaking
- Non-Contact
- Night
- Fixed Object
- Traffic Signal
- Pedestrian
- Bicyclist
- Injury
- Fatality
- Injury Severity (A, B, C)
- Construction
- Cloudy
- Snow/Ice
- Rain
- Fog/mist

2014-2018 WIS 35 (West Ave.) & State St.

47 Crashes La Crosse County

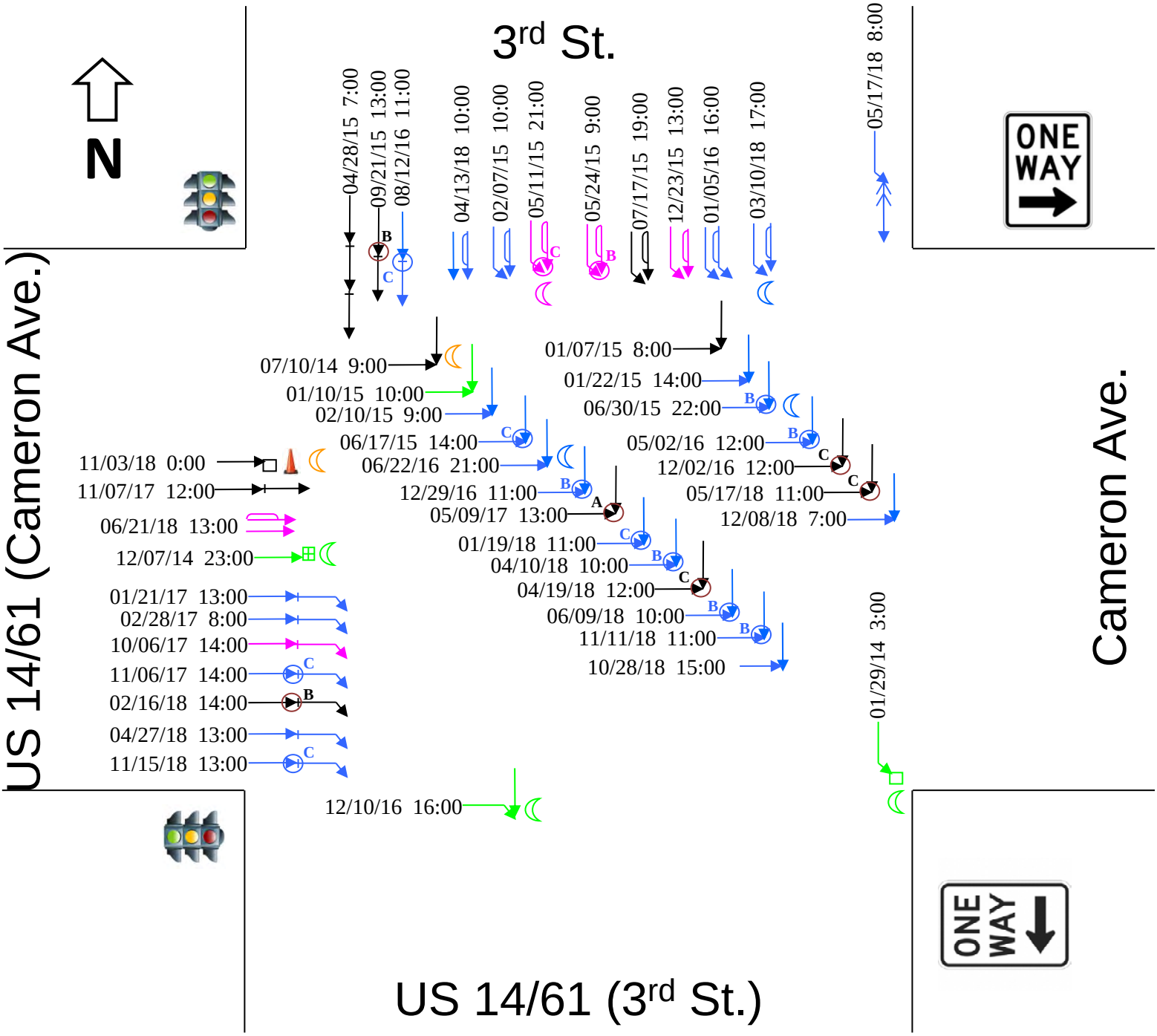


Legend

- Stopped
- Sideswipe
- Backing
- Overtaking
- Non-Contact
- Night
- Fixed Object
- Traffic Signal
- Pedestrian
- Bicyclist
- Injury
- Fatality
- Injury Severity (A, B, C)
- Construction
- Cloudy
- Snow/Ice
- Rain
- Fog/mist

2014-2018
45 Crashes

US 53 SB (3rd St.) & US 14/61 EB (Cameron Ave.) La Crosse County

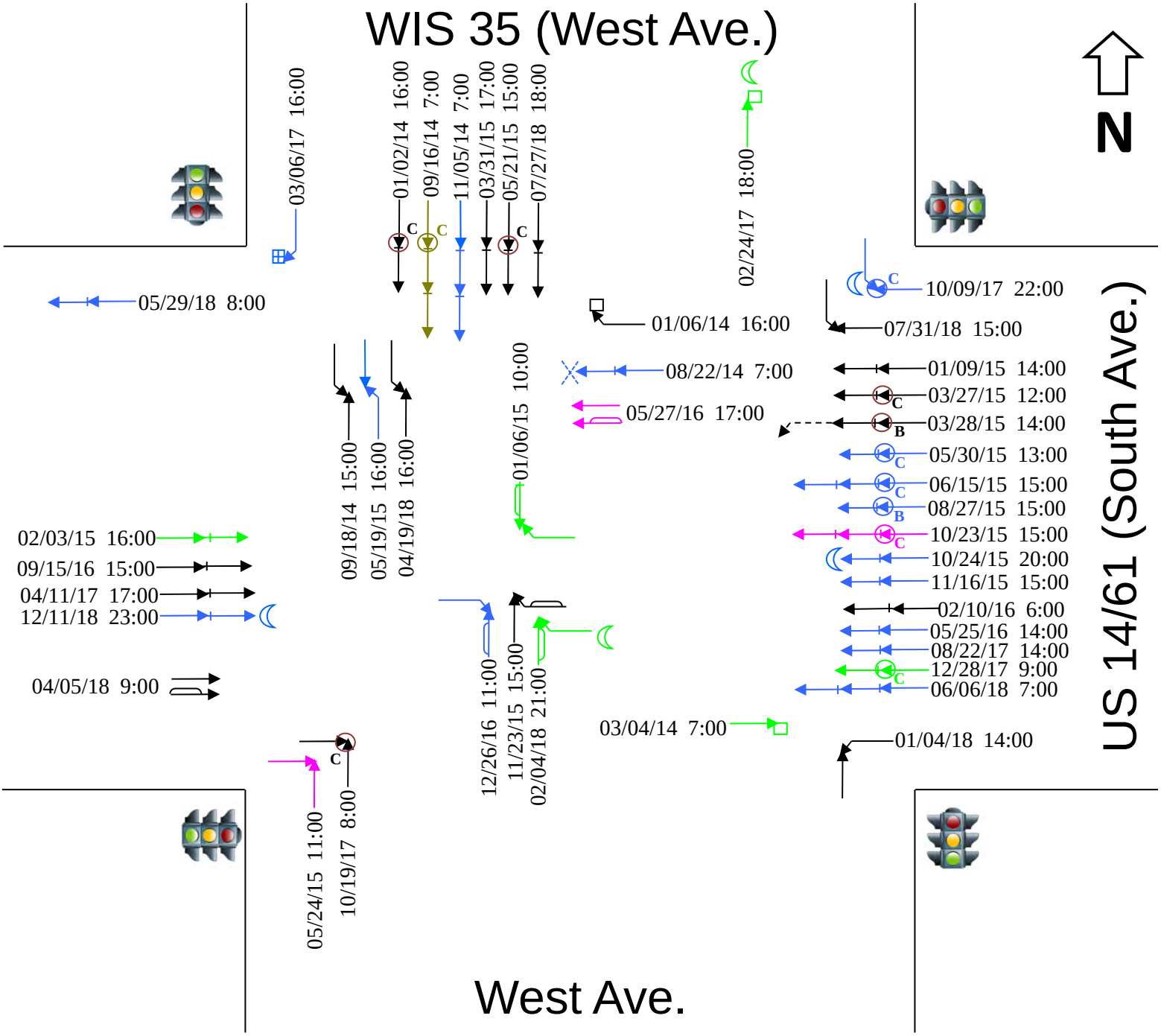


Legend

- Stopped
- Sideswipe
- Backing
- Overtaking
- Non-Contact
- Night
- Fixed Object
- Traffic Signal
- Pedestrian
- Bicyclist
- Injury
- Fatality
- Injury Severity (A, B, C)
- Construction
- Cloudy
- Snow/Ice
- Rain
- Fog/mist

2014-2018 US 14/61 (South Ave.) & WIS 35 (West Ave.)

44 Crashes La Crosse County

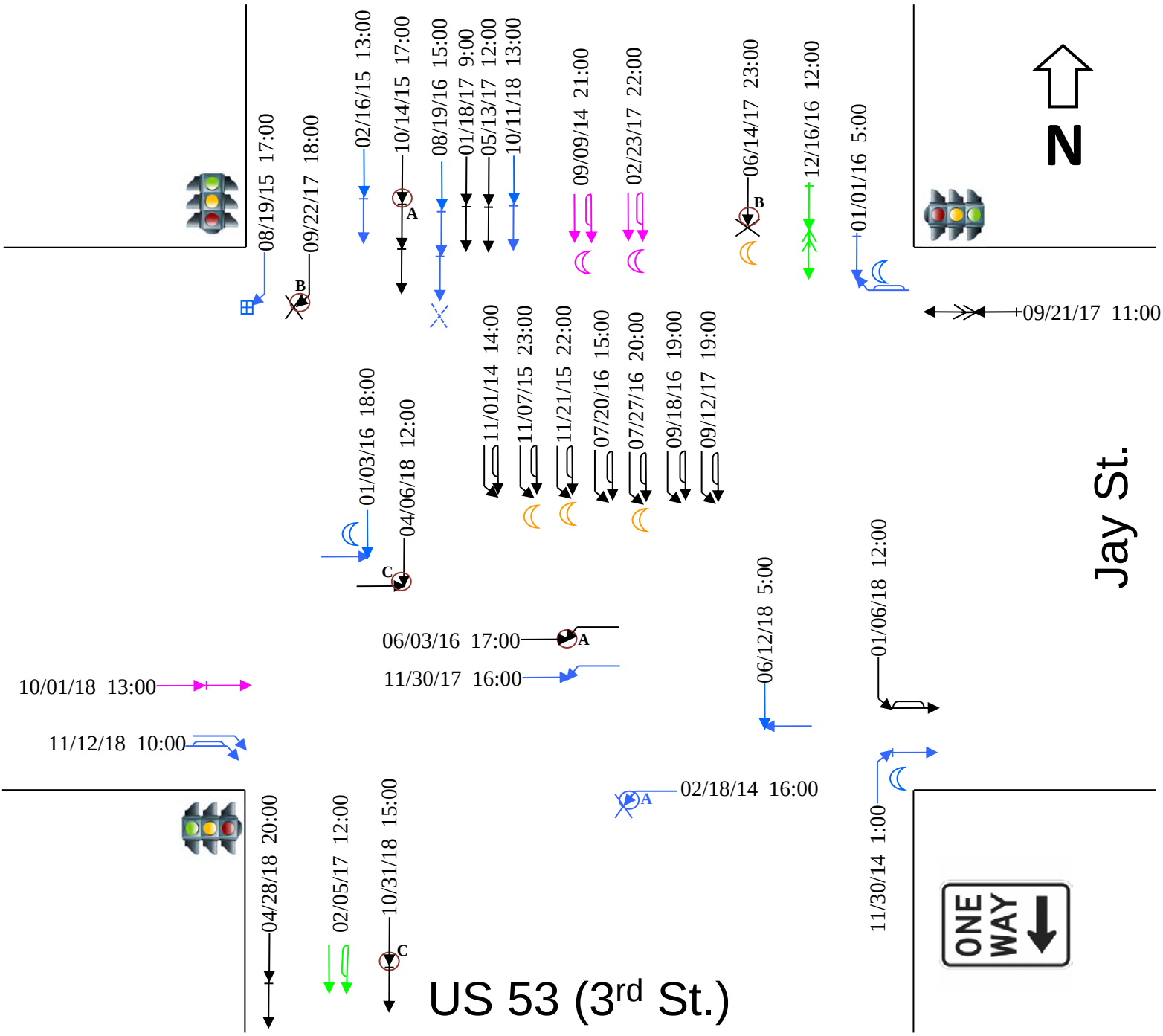


Legend

- Stopped
- Sideswipe
- Backing
- Overtaking
- Non-Contact
- Night
- Fixed Object
- Traffic Signal
- Pedestrian
- Bicyclist
- Injury
- Fatality
- Injury Severity (A, B, C)
- Construction
- Cloudy
- Snow/Ice
- Rain
- Fog/mist

2014-2018 US 53 SB (3rd St.) & Jay St.

34 Crashes La Crosse County

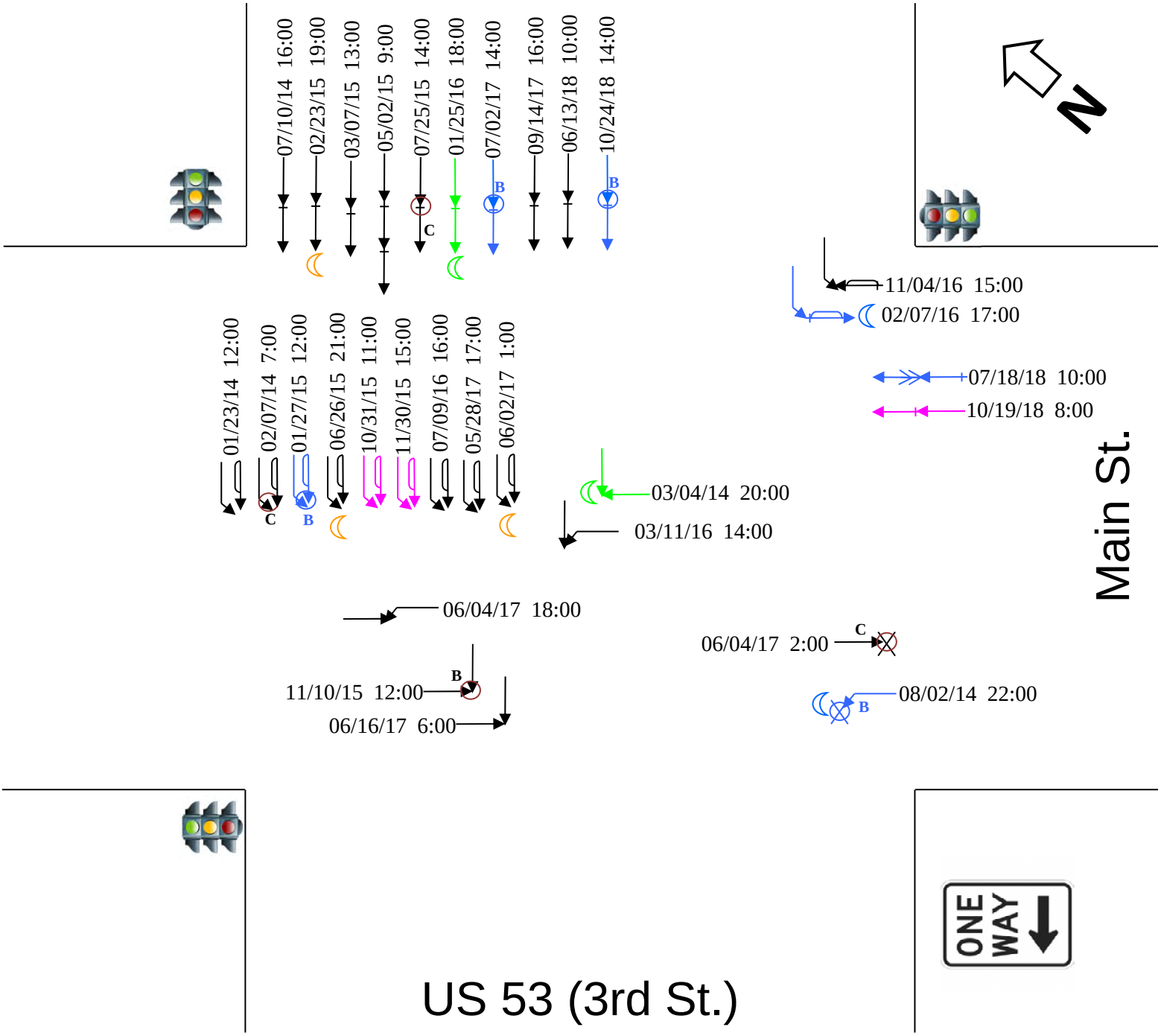


Legend

- Stopped
- Sideswipe
- Backing
- Overtaking
- Non-Contact
- Night
- Fixed Object
- Traffic Signal
- Pedestrian
- Bicyclist
- Injury
- Fatality
- Injury Severity (A, B, C)
- Construction
- Cloudy
- Snow/Ice
- Rain
- Fog/mist

2014-2018 US 53 SB (3rd St.) & Main St.

30 Crashes La Crosse County

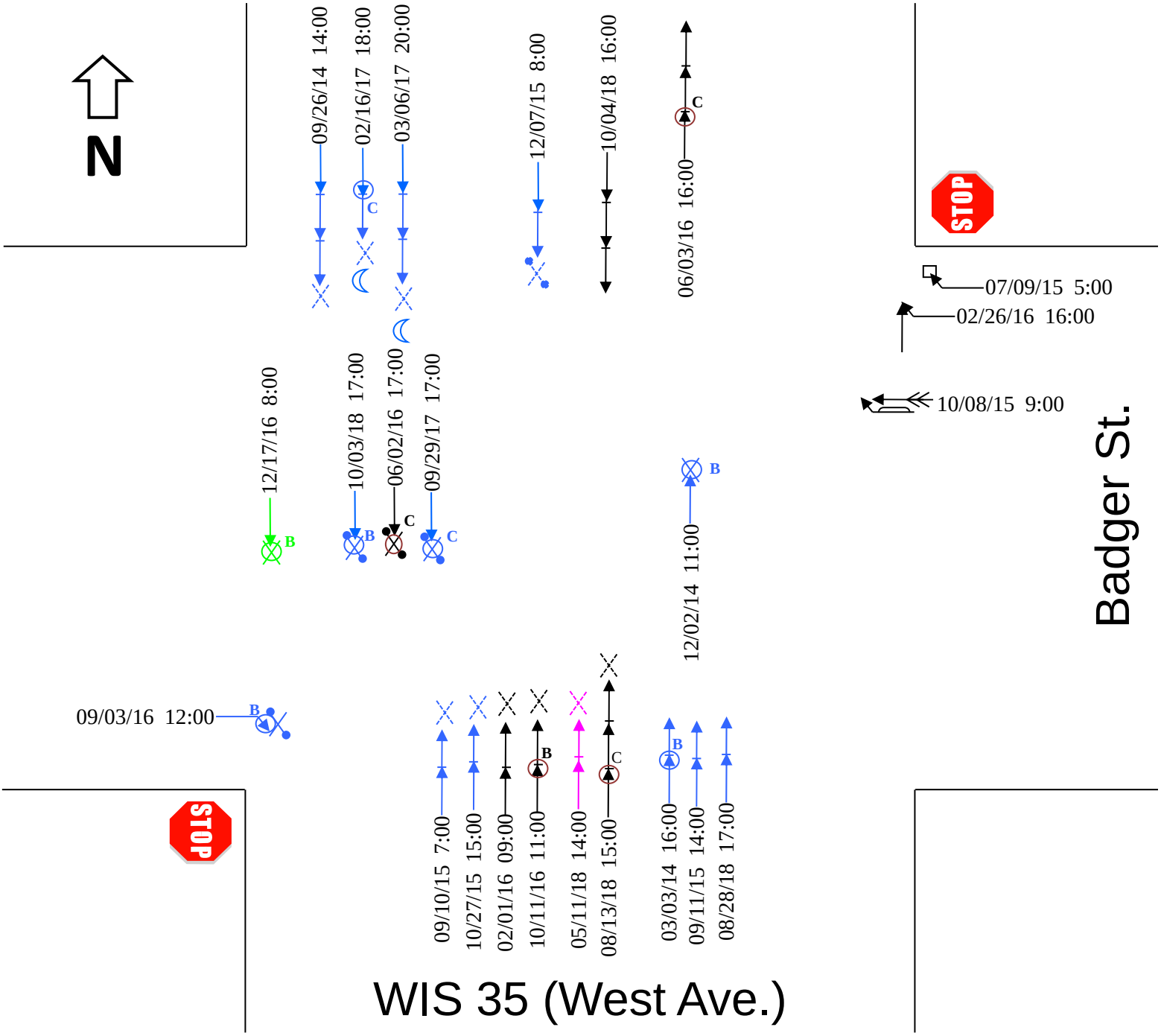


Legend

Stopped	Night	Injury		Cloudy
Sideswipe	Fixed Object	Fatality		Snow/Ice
Backing	Traffic Signal	Injury Severity		Rain
Overtaking	Pedestrian	(A, B, C)		Fog/mist
Non-Contact	Bicyclist	Construction		

2014-2018 WIS 35 (West Ave.) & Badger St.

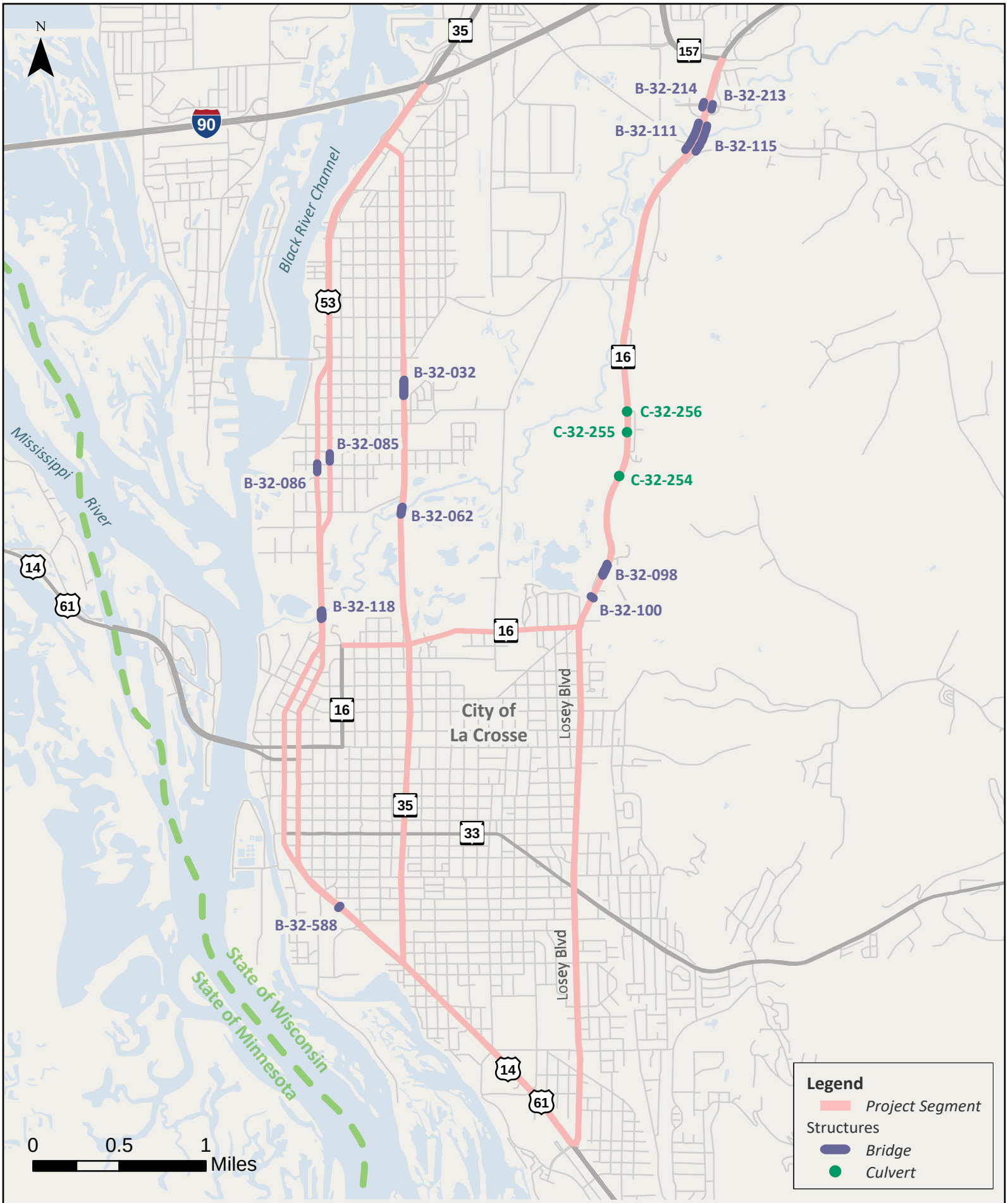
24 Crashes La Crosse County



Legend

- Stopped
- Sideswipe
- Backing
- Overtaking
- Non-Contact
- Night
- Fixed Object
- Traffic Signal
- Pedestrian
- Bicyclist
- Injury
- Fatality
- Injury Severity (A, B, C)
- Construction
- Cloudy
- Snow/Ice
- Rain
- Fog/mist

Appendix 9: Existing Structures Data



Structure Locations

La Crosse Safety and Operations Study

December 2021

WisDOT ID: 1630-08-00

Existing Structures Data

Bridge Number	Roadway On (Study Name)	Roadway Under (Study Name)	built
B-32-32	WIS 35 - George Street	Chicago, Milwaukee, St. Paul and Pacific (CMSTPP) Railroad	1962
B-32-62	WIS 35 - Lang Drive	La Crosse River	1982
B-32-85	US 53 NB - Rose Street	Chicago, Milwaukee, St. Paul and Pacific (CMSTPP) Railroad/ Andrew Street	1980
B-32-86	US 53 SB - Copeland Avenue	Chicago, Milwaukee, St. Paul and Pacific (CMSTPP) Railroad/Island Street	1983
B-32-98	WIS 16	Burlington Northern Santa Fe (BNSF) Railroad	1981
B-32-100	WIS 16	Miller Coulee Pedestrian Trail	1981
B-32-111	WIS 16 WB	LaCrosse River/Chicago, Milwaukee, St. Paul and Pacific (CMSTPP) Railroad	1986
B-32-115	WIS 16 EB	LaCrosse River/Chicago, Milwaukee, St. Paul and Pacific (CMSTPP) Railroad	1937
B-32-118	US 53-Copeland Avenue	La Crosse River	1987
B-32-213	WIS 16 EB	12th Avenue	2006
B-32-214	WIS 16 WB	12th Avenue	2006
B-32-588	Gunderson Clinic Skywalk	US 14/US 61	1988
C-32-254	WIS 16	Drainage Way	1985
C-32-255	WIS 16	Drainage Way	1986
C-32-256	WIS 16	Drainage Way	1985

Source: WisDOT HSIS (Highway Structures Information System) September, 2020

Bridge Number2	Structure Age	> 50 years old	Age in 2050	type	Number of Spans	Configuration	Material	Date of Last Inspection	NBI Deck
B-32-32	58	1	88	BRIDGE	4	Deck Girder	Cont. Steel	4/29/2020	6
B-32-62	38	0	68	BRIDGE	4	Deck Girder	Cont. Prest. Conc	4/30/2020	7
B-32-85	40	0	70	BRIDGE	2	Deck Girder	Cont. Steel	4/29/2020	6
B-32-86	37	0	67	BRIDGE	3	Deck Girder	Cont. Prest. Conc	4/29/2020	6
B-32-98	39	0	69	BRIDGE	3	Deck Girder	Cont. Steel	8/27/2019	5
B-32-100	39	0	69	BRIDGE	3	Box Culvert	Cont. Concrete	8/22/2019	---
B-32-111	34	0	64	BRIDGE	6	Deck Girder	Cont. Steel	5/18/2020	5
B-32-115	83	1	113	BRIDGE	11	Deck Gird./FL. Sys. & Deck Truss	Steel	5/19/2020	6
B-32-118	33	0	63	BRIDGE	4	Deck Girder	Cont. Prest. Conc	4/30/2020	6
B-32-213	14	0	44	BRIDGE	2	Deck Girder	Cont. Prest. Conc	11/11/2019	7
B-32-214	14	0	44	BRIDGE	2	Deck Girder	Cont. Prest. Conc	11/11/2019	7
B-32-588	32	0	62	BRIDGE	1	Deck Girder	Steel	No Inspection	---
C-32-254	35	0	65	CULVERT	1	Box Culvert	Concrete	5/24/2018	---
C-32-255	34	0	64	CULVERT	1	Box Culvert	Concrete	5/24/2018	---
C-32-256	35	0	65	CULVERT	1	Box Culvert	Concrete	5/24/2018	---
	37.66667	**2**							**6**

Source: WisDOT HSIS (Highway Structures Information System) September, 2020

Bridge Number3	NBI Superstructure	NBI Substructure	NBI Culvert	Load Postings
B-32-32	7	7	---	No
B-32-62	8	7	---	No
B-32-85	7	6	---	No
B-32-86	8	8	---	No
B-32-98	7	7	---	No
B-32-100	---	---	6	No
B-32-111	7	7	---	No
B-32-115	5	6	---	No
B-32-118	8	7	---	No
B-32-213	7	7	---	No
B-32-214	8	7	---	No
B-32-588	---	---	---	No
C-32-254	---	---	6	No
C-32-255	---	---	7	No
C-32-256	---	---	6	No
	7	**7**	**6**	

Source: WisDOT HSIS (Highway Structures Information System) September, 2020

Vertical Clearance

None of the bridges in the corridor are over OSOW routes. B-53-118, and B-53-85/86 are on OSOW routes.

Bridge Number	Roadway On (Study Name)	Roadway Under (Study Name)	Existing Vertical Clearance	RR Vertical	Min. Roadway Clearance FDM 11-35, Attachment 1.9		Min. Railroad Clearance FDM 11-35, Attachment 1.9	
B-32-32	WIS 35 - George Street	Chicago, Milwaukee, St. Paul and Pacific (CMSTPP) Railroad	---	23.33	---	---	23	OK
B-32-85	US 53 NB - Rose Street	Chicago, Milwaukee, St. Paul and Pacific (CMSTPP) Railroad/ Andrew Street	11.83	22.9375	14.75	RED FLAG	23	RED FLAG
B-32-86	US 53 SB - Copeland Avenue	Chicago, Milwaukee, St. Paul and Pacific (CMSTPP) Railroad/Island Street	16.3	22.25	14.75	OK	23	RED FLAG
B-32-98	WIS 16	Burlington Northern Santa Fe (BNSF) Railroad	---	23.43	---	---	23	OK
B-32-100	WIS 16	Miller Coulee Pedestrian Trail	8	---	8	OK	---	---
B-32-111	WIS 16 WB	LaCrosse River/Chicago, Milwaukee, St. Paul and Pacific (CMSTPP) Railroad	---	29.6	---	---	23	OK
B-32-115	WIS 16 EB	LaCrosse River/Canadian Pacific (CP) Railroad	---	26.5	---	---	23	OK
B-32-213	WIS 16 EB	12th Avenue	17.5	---	14.75	OK	---	---
B-32-214	WIS 16 WB	12th Avenue	17.2	---	14.75	OK	---	---
B-32-588	Gunderson Clinic Skywalk	US 14/US 61	19.6	---	17.333	OK	---	---

Source: WisDOT HSIS (Highway Structures Information System) September, 2020

Lateral Clearance - Railroad

Bridge Number	Roadway On (Study Name)	Roadway Under (Study Name)
B-32-32	WIS 35 - George Street	Chicago, Milwaukee, St. Paul and Pacific (CMSTPP) Railroad
B-32-85	US 53 NB - Rose Street	Chicago, Milwaukee, St. Paul and Pacific (CMSTPP) Railroad/ Andrew Street
B-32-86	US 53 SB - Copeland Avenue	Chicago, Milwaukee, St. Paul and Pacific (CMSTPP) Railroad/Island Street
B-32-98	WIS 16	Burlington Northern Santa Fe (BNSF) Railroad
B-32-111	WIS 16 WB	LaCrosse River/Chicago, Milwaukee, St. Paul and Pacific (CMSTPP) Railroad
B-32-115	WIS 16 EB	LaCrosse River/Canadian Pacific (CP) Railroad

Source: WisDOT HSIS (Highway Structures Information System) September, 2020

	Actual Lateral Clearances							
	LEFT				RIGHT			
Bridge Number	Left Lateral	Clearance To	Hammerhead SF Area	Crash Wall	Right Lateral	Clearance To	Hammerhead SF Area	Crash Wall
B-32-32	89.4	Multi-Column with Crash Wall	---	Yes	10.3	Multi-Column with Crash Wall	---	Yes
B-32-85	10	Hammerhead Pier	46.07	No	26.7	Hammerhead Pier	46.07	No
B-32-86	33	Pier 2 - Hammerhead	46.07	No	15.5	Hammerhead Pier	46.07	No
B-32-98	19.7	Hammerhead Pier	46.07	No	19.7	Hammerhead Pier	46.07	No
B-32-111	18	Wall Pier	150.49965	No	30	Multi-Column with Crash Wall	---	Yes
B-32-115	8.5	Multi-column pier	---	No	13.5	Multi-column pier	---	No

Source: WisDOT HSIS (Highway Structures Information System) September, 2020

		Required Lateral Clearance				
Bridge Number	**Is Existing Track Curved?**	**Left**	**Right**	**Source**	**Assumptions**	**Meet Clearance?**
B-32-32	No	18	18	Std. 38.01	Looked at existing plans; show 12' and 13' clearance to centerline of tracks at pier 2.	No
B-32-85	No	18	18	Std. 38.01	Original Plans show 10' min. clearance to centerline of tracks	No
B-32-86	Yes	18	18	Std. 38.01	ack is 33' from pier 2. No dimensions on plans but not sure if from CL of track to R-32-11 is 25'-0	No
B-32-98	No	18	18	Std. 38.01		Yes
B-32-111	No	18	18	Std. 38.01		Yes
B-32-115	Yes	25	25	Std. 38.01	Original Plans show 10' min. clearance to centerline of tracks	No

Source: WisDOT HSIS (Highway Structures Information System) September, 2020

Lateral Clearance - Roadways

Bridge Number	Roadway On (Study Name)	Roadway Under (Study Name)	Left Lateral	Right Lateral	Min. Horizontal	Left Lateral	Right Lateral
B-32-100	WIS 16	Miller Coulee Pedestrian Trail	8.5	---	---	---	---
B-32-213	WIS 16 EB	12th Avenue	12.5	9.5	46	9.5	14.5
B-32-214	WIS 16 WB	12th Avenue	12.5	9.5	46	9.5	14.5

Source: WisDOT HSIS (Highway Structures Information System) September, 2020

Bridge Number	Urban/Rural	Roadway Type	Left Barrier Type	Attachment	Case	1	2	3	Right Barrier Type	Attachment	Case	1	2	3	Lateral Clearance OK?
B-32-100						10									No
B-32-213	Urban	Non-Arterial	None	1.6	h	4	0	0	None	1.6	c	4	0	0	Yes
B-32-214	Urban	Non-Arterial	None	1.6	h	4	0	0	None	1.6	c	4	0	0	Yes

Source: WisDOT HSIS (Highway Structures Information System) September, 2020