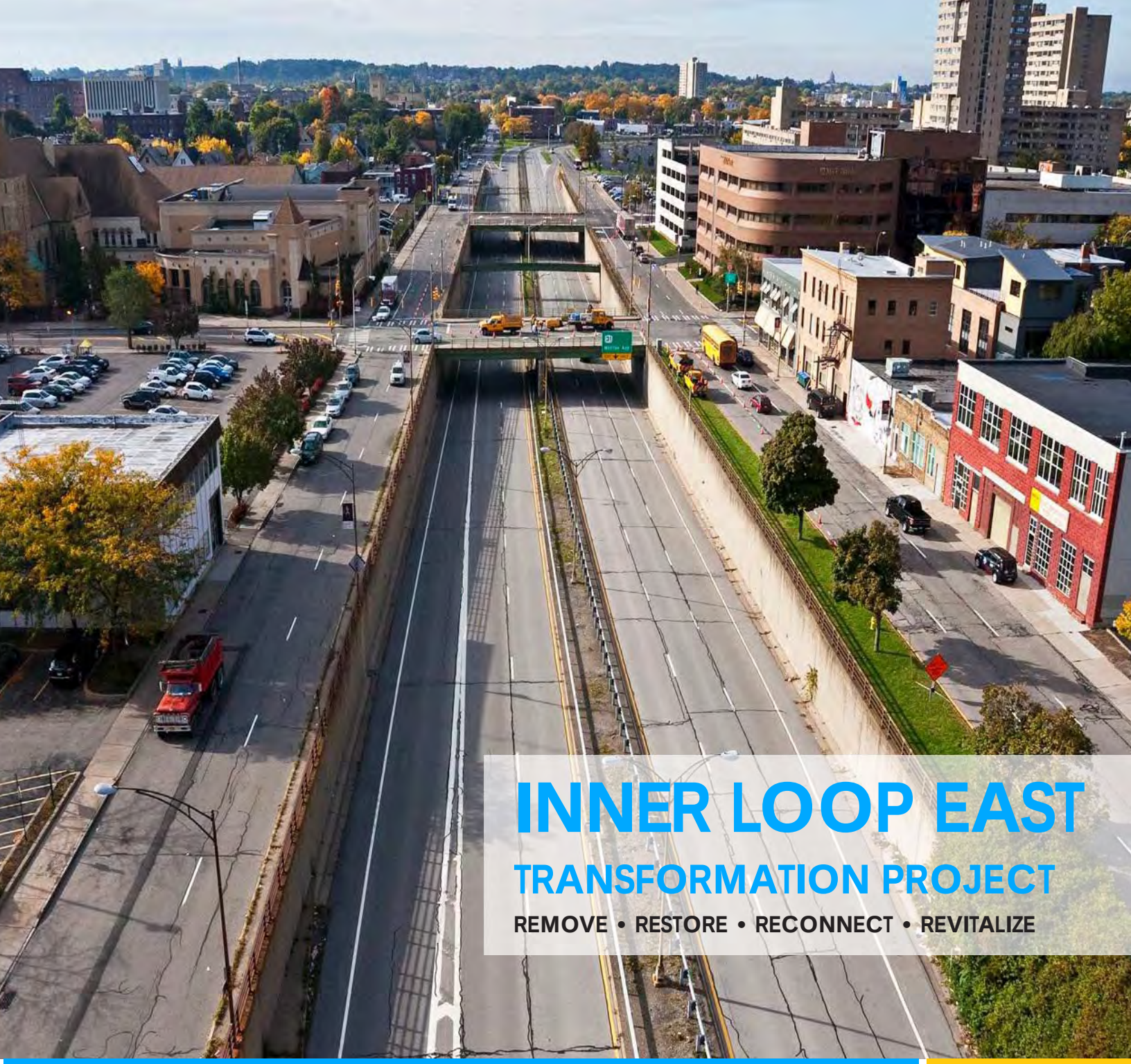

INNER LOOP EAST

TRANSFORMATION PROJECT

REMOVE • RESTORE • RECONNECT • REVITALIZE

FINAL DESIGN REPORT – Volume 2

PIN 4940.T7

MARCH 2014

Inner Loop East
From Barrier to Beautiful

City of Rochester, Department of Environmental Services

New York State Department of Transportation

Federal Highway Administration

Stantec

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Go / No Go Analysis

Memo **Final**

Stantec

To:	John Thomas City Of Rochester	From:	William C. Holthoff Rochester (2250) NY Office
File:	Inner Loop 192500170	Date:	January 13, 2009 April 24, 2009 Revised

This document has been revised based on New York State Department of Transportation and Monroe County Department of Transportation comments (attached).

Raising the Eastern Portion of the Inner Loop

Go/No Go Analysis

Introduction

The possibility of raising the eastern portion of the Inner Loop from Main Street to Monroe Avenue/Chestnut Street, to an at-grade boulevard or arterial was first considered and recommended in the "Vision 2000 Plan" prepared in the early 1990's. Since then, a number of additional studies have been completed to assess the potential of raising various segments of the Inner Loop to grade, and the land use implications resulting from such a modification to the City's street grid. The current study is scoped to determine the feasibility of raising the eastern section of the Inner Loop to grade, including a detailed analysis of transportation benefits, possible environmental and social impacts, the life cycle costs of maintaining the existing Inner Loop and its service roads, as well as safety and structural analysis of the retaining walls, bridges and pavement that make up this section of the Inner Loop and the service roads.

Prior to undertaking this costly analysis using public funds, it is prudent to at least undertake an initial traffic analysis to determine if there is a feasible alternative that can maintain or improve traffic operations in the study area if the Inner Loop is reconstructed to an at-grade boulevard or arterial. In addition, whether or not these roadway network changes will have any significant impacts outside the immediate study area should be determined. Thus, this initial study is being completed in order to be able to make a Go/No Go decision on whether to proceed with the significantly detailed and costly study. This memo addresses these issues and provides the supportive analysis and information needed to make a determination on whether to proceed with the more detailed study.

In summary, this memo is intended to address two (2) items:

1. Will raising the eastern portion of the Inner Loop to grade have transportation impacts beyond the existing Inner Loop and adjacent intersections?

2. Is there at least one feasible alternative that would allow the eastern portion of the Inner Loop to be raised to grade without having severe transportation impacts within and around the immediate transportation network, now and in the future?

Summary of Findings

1. The traffic impacts of raising the eastern portion of the Inner Loop will be limited to the eastern Inner Loop area and adjacent intersections;

2. Future growth in traffic in the area will be traffic generated by proposed new developments or redevelopments within the Rochester CBD to the year 2014. After 2014 traffic is forecasted to increase by +0.625% per year, without raising the Inner Loop and if the Inner Loop is raised +0.75% per year (the larger value to reflect redevelopment of land vacated by raising the Inner Loop);

3. Construction of the I-490 Western Gateway Project, underway when most of the updated traffic counts where obtained, had little if any notable impact on travel patterns and traffic volumes in the eastern Inner Loop Area;

4. That Level of Service (LOS) on the existing portion of the eastern Inner Loop and adjacent intersections are and will remain (through the year 2035), LOS of "C" or better with no individual movements below LOS "D";

5. That raising most of the eastern Inner Loop between the Monroe/Chestnut intersection to the East Avenue Intersection to two (2) through travel lanes in each direction, plus a separate left turn lane at major intersections, will maintain the high levels of traffic operations that would exist, if the eastern Inner Loop was not raised;

6. There are at least two (2) alternatives that would maintain high levels of traffic operations if the eastern Inner Loop was raised to grade at Main Street. However, to achieve these levels of traffic operations, the Inner Loop on/off ramp to Main Street would need to be widened from 5 lanes to 8 lanes and the section of University Avenue between South Union Street and Main Street would need to be widened from 5 lanes to either 7 or 8 lanes, depending on the alternative;

7. Due to the proximity of intersections, vehicle storage for the section of University Avenue between South Union Street and Main Street is an issue now, and will remain so into the future, for the existing Inner Loop or a raised Inner Loop.

8. That some of these widening and storage issues at the intersections near Main Street and University Avenue may be reduced by further refinements, acceptance of lower levels of traffic operations, or possibly by using Roundabouts. These and other alternatives will be explored given a Go decision.

9. That accident rates on the mainline section of the Inner Loop do not exceed the statewide average for accidents on this type of highway. However, eight (8) of the eleven (11) adjacent intersections exceed the statewide average and ten (10) of the eleven (11) exceed the Monroe County Accident rate for an at-grade intersection, with a number of these intersections having a high rate of right angle accidents that might be corrected by replacing these intersections with a Roundabout or other alternative improvements.

10. A new I-490 westbound off-ramp to the Inner Loop could:

    a. Be designed and constructed with a design speed of 25 MPH, 5% super elevation and posted for 20 MPH;

    b. Would sever the existing pedestrian connection between Monroe Avenue and the South Wedge.

    c. May attract 300 to 450 vehicles during the morning peak hour. The majority of this traffic (200 to 300) would divert from the I-490 off-ramp to Goodman Street. This traffic uses Broadway to reach this section of the Inner Loop. The remaining traffic would divert from the Clinton Avenue off-ramp;

    d. The majority of this additional traffic is already traveling within the Inner Loop area. Analysis of this additional traffic on a raised Inner Loop would indicate that levels of traffic operations would remain acceptable (overall LOS "C" with no individual movements below "D");

    e. That analysis of possible traffic impacts to I-490 (e.g. ramp spacing, decision sight distance, traffic operations) as a result of constructing this ramp, if any, will be identified after the Go decision;

    f. The cost of constructing this ramp is approximately $2.6 million;

11. The current estimated construction cost (including professional design and construction inspection services) of raising the eastern Inner Loop to grade between Chestnut/Monroe Avenue to Main Street is $33.3 million (excluding the new I-490 off-ramp).

Recommendations and Conclusions

Based on the analysis, the following recommendations should be considered related to further study of raising the Inner Loop:

1. **Inner Loop between Chestnut/Monroe and East Avenue** – The analysis did not identify any major travel disadvantages of reconstructing this section of the Inner Loop with a 5 lane arterial or boulevard. Thus, it is recommended that a GO decision be made and allowing a more detail analysis of this section to progress.

2. **Inner Loop at Main Street** – Analysis indicates two traditional intersection alternatives that would maintain reasonable traffic operations if the Inner Loop was brought to grade at Main Street. Both alternatives, however, would require significant road widening to the existing Inner Loop Main Street ramps and the section of University Avenue between Main Street and South Union Street.

   If undertaken, this would free up a significant amount of developable land, however, the impacts of widened streets in this area may not be acceptable. It is recommended that the concept of raising the Inner Loop at Main Street be carried forward into the next phase to determine whether other alternatives, such as Roundabouts, or diverting University Avenue traffic to the Scio Street interchange, may reduce these impacts to a more acceptable level. If not, consideration of raising the Inner Loop at Main Street should be documented and dropped from further consideration.

3. **Westbound I-490 off-ramp to the Inner Loop** – Review of this ramp indicates that it could be constructed; however, it would need to operate at a very low speed and sever a pedestrian connection between portions of the city. If this ramp is still considered an important addition to the highway network, then an analysis to determine any possible impacts of this low speed ramp to the I-490 mainline should be undertaken. If these impacts are acceptable, then discussions with FHWA should be undertaken to determine whether they will consider construction of this low speed ramp from the Interstate highway.

The remainder of this memo documents the process, analysis and findings in much greater detail.

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Raising the Eastern Inner Loop – Go/No Go Analysis

Background

The concept of the Inner Loop was developed in the 1960s. The concept and eventual implementation was to assist in distributing traffic in and around the Rochester Central Business District (CBD) as a result of construction of the I-490 expressway, as well as the future extension of I-390 to the CBD area. Since that time, the Inner Loop was constructed, as was I-490; however, the extension of I-390 to the CBD has not and never will be constructed. While many sections of the Inner Loop have served their purpose (i.e. distributing traffic in and around the Rochester CBD) and are valid links to maintain reasonable traffic operations in this area, the lightly used eastern portion of the Inner Loop that consists of 10 to 12 travel lanes associated with both the Inner Loop and the service roads that parallel it, has not.

This lightly used section of the Inner Loop is most likely the result of not extending I-390 to the Rochester CBD. Thus the question, should this section, which serves little, if any, transportation purpose and creates a barrier for pedestrian, bicyclist and motor vehicles, continue to exist? Also, the costs required to maintain 10 to 12 lanes of highway, four bridges, 8 traffic lights and as well as the opportunity costs of the land in the area that could be developed for other purposes should be considered.

Inner Loop Study Area

Concerns have been raised as to what traffic impacts might result from raising the eastern end of the Inner Loop on other area highways. In particular, on the expressway system and other arterials serving the Rochester Central Business District (CBD). If traffic increased significantly on other highway segments as a result of raising the Inner Loop, then the study area for this project would need to enlarged to address any traffic impacts that resulted.

To address this concern, the Genesee Transportation Council (GTC) Regional Travel Forecasting Model was employed. The forecasting model was run with and without the Inner Loop being raised for the year 2014, the year being used to analyze all the different proposed land use changes within the CBD. The resulting forecasted travel volumes were then compared at major segments of the highway system, with the Inner Loop being raised and without raising it, to determine any major traffic volume changes away from the Inner Loop that would occur.

The analysis, presented in Attachment A, compared segments of the expressway system, major arterials and Genesee River Bridge Crossings. The analysis found any traffic impact resulting from raising the Inner Loop to be in the immediate area adjacent to the section of Inner Loop being raised. Raising the Inner Loop will have no notable traffic impacts to the expressway system, their interchanges, or on major arterials surrounding or serving the Rochester CBD. Thus, the study area for determining the traffic impacts is at intersections with the Inner Loop and those immediately adjacent to them.

Growth in Traffic - 20 Years after Reconstruction

Review of the travel patterns generated by the GTC Regional Forecasting model for the years 2005 to 2014 reflects all the planned land use changes in and around the Rochester Central Business District (CBD). While change in traffic between 2005 and 2014 does vary depending on what roadway section was reviewed, at most it shows an increase of 10%. Traffic growth along most roadway sections is less than 5% (or 0.625 per year) during the 8 year period forecasted.

Thus, to determine Inner Loop travel at ETC+20 or for the year 2035, the following was done:

1. The base traffic counts taken in 2008 were used to forecast future traffic volumes to 2035;

2. MCDOT created a future (2014) traffic file to reflect all the land use changes proposed for the CBD. These projections where used to forecast traffic to 2014;

3. The 2014 traffic forecasted by MCDOT was then increased by 0.625% per year to 2035 (ETC+20) using a straight percentage increase for traffic using the existing Inner Loop (without it being raised)

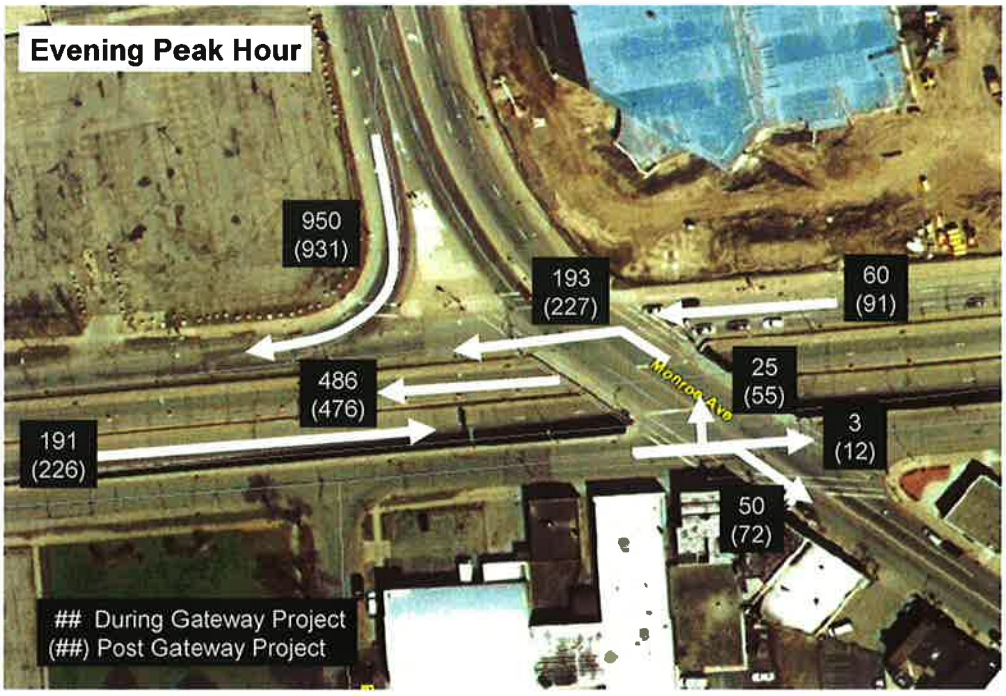
4. For a raised Inner Loop, a higher percentage was used (0.75% per year) to forecast traffic using a raised Inner Loop to the year 2035. The higher percentage increase used for a raised Inner Loop reflects additional traffic from development of the lands available by removing the Inner Loop.

This method of forecasting future travel for the Inner Loop was presented, reviewed and accepted by the Steering Committee.

Impact of Western Gateway Project (I-490 Reconstruction)

The traffic counts used to analyze the potential traffic impacts were obtained during the summer of 2008 while the I-490 Western Gateway Project was under construction, which had various restrictions and lane as well as ramp closures. To determine the possibility that the Western Gateway Project may have changed travel patterns of vehicles using the eastern Inner Loop and as such would affect the results, additional traffic counts were taken at the Monroe/Chestnut interchange with the Inner Loop, including the Inner Loop Main Line. These counts where taken after all I-490 Western Gateway Project lanes and ramps were reopened to traffic. The counts were taken on Thursday, 12/4/08 and the results were compared to counts taken during the months of June and August of 2008. Minor differences of traffic getting on or off the Inner Loop at Monroe/Chestnut were found, however there was little notable change in traffic using the Inner Loop itself. As a result, the traffic volumes using the Inner Loop and adjacent intersections analysis were adjusted to reflect the higher, but minor changes in traffic volumes.

The following figures compare the intersection turning movement counts taken while construction was occurring on the I-490 Western Gateway Project and those counted after all sections of I-490 were open to traffic. Overall, the comparison shows that the I-490 Western Gateway Project, which was under construction at the time many of the traffic counts where obtained, had little notable impact on travel behavior in the eastern portion of the Inner Loop.



Present and Future Traffic Operations

2008 Traffic Operations

Updated (2008) traffic turning movement counts were obtained during the weekday morning and evening peak travel hours along the eastern Inner Loop and adjacent intersections. Heavy vehicle data was also obtained at each of the locations and reflected in the analysis. This information was then used to determine current operating conditions. The analysis found that the Level of Service at all Inner Loop and adjacent intersections are operating well; all with Level of Service (LOS) of "C" or better with no turning movement below LOS "D".

2035 Future Traffic Operations

Again, all intersections were found to provide of LOS "C" or better with no turning movements below LOS "D".

Traffic Operations - Raised Inner Loop

In order to be able to make a Go Decision, at least one alternative layout needs to be identified. This alternative will maintain reasonable levels of operation in the area (LOS "D" for intersection and turning movements). For this level of analysis, a reasonable alignment was chosen (generally following Union Street corridor). Using this corridor alignment, two (2) options where explored. The first option includes raising the Inner Loop from Monroe/Chestnut to East Avenue only (Option 1). The second option extends raising the Inner Loop to Main Street with two (2) sub-options; one without re-connecting University Avenue (Option 2), the other with the re-connection of University Avenue (Option 4).

The analysis shows LOS "C" or better could be maintained with no turning movements below LOS of "D" for all alternatives and sub-options, provided additional improvements are made at Main Street and University Avenue.

To achieve these levels of traffic operations would require:

- Generally, two (2) through lanes on the raised Inner Loop portion between Monroe Avenue and University Avenue with separate left turn lanes at intersections. These improvements are consistent for all alternatives.

- If the Inner Loop <u>is not</u> raised at Main Street, then no further improvements would be required at the intersection of Main Street and at the South Union Street Intersection with University Avenue.

- Raising the Inner Loop to grade at Main Street, however, would require the Inner Loop on/off ramp to be widened from 5 lanes to 8 lanes for either alternative considered. While no improvement would be required to east/west Main Street, the section of University Avenue between South Union Street and Main Street would need to be widened from 5 lanes to 7 lanes if the two sections of

University Avenue are not reconnected. If University Avenue is reconnected, a 4 lane new road connection would be needed.

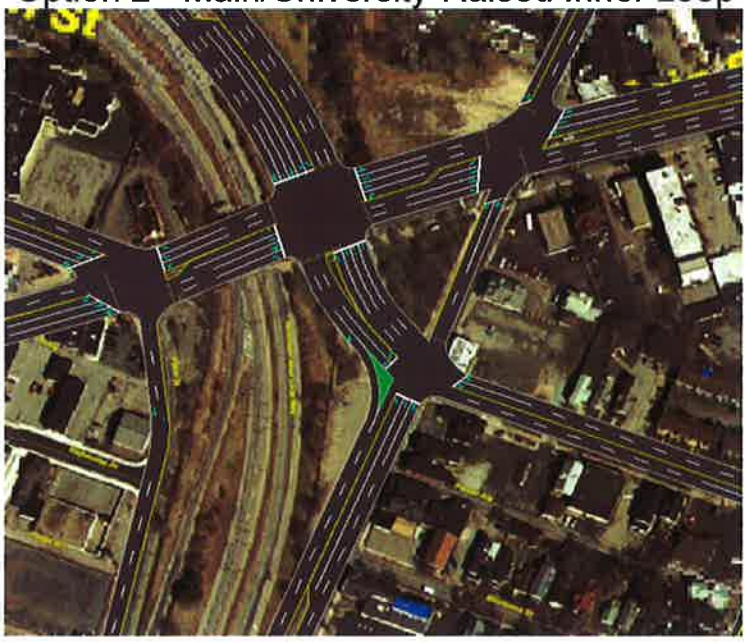
The following 5 figures present the lane configuration needed to maintain LOS at each key intersections. Note that some of these widening and storage issues may be reduced by further refinement, acceptance of lower levels of traffic operations, or possibly by using Roundabouts.

Chestnut/Monroe/Raised Inner Loop
(Option 1, 2 and 4)

East Avenue, Broad Street/Raised Inner Loop
(Option 1, 2 and 4)

Option 1 - Main/University-Inner Loop **Not** Raised

Option 2 - Main/University-Raised Inner Loop



Option 4 - Main/University-Raised Inner Loop
Re-Connected University Avenue

The following table summarizes the overall intersection results. A detailed LOS by turning movement is presented in Attachment C, and the Synchro analysis files are contained in the attached CD.

Intersection Queuing Analysis

While each individual intersection was found to provide a reasonable LOS, the possibility that these levels of operation could not be achieved because of the lack of vehicle storage between intersections, or the various vehicle turning lanes, was also explored. Overall, the queue lengths where found to be less than the available storage lengths available for 2008 conditions and 2035 conditions for both the existing Inner Loop and for most options under a raised Inner Loop. The area with the least amount of vehicle storage between intersections, however, is on University Avenue between Main Street and South Union Street. A queuing analysis table is presented in Attachment C.

Overall Level of Service

Intersection	2008								2035							
	AM				PM				AM				PM			
	Existing	Option 1	Option 2	Option 4	Existing	Option 1	Option 2	Option 4	Existing	Option 1	Option 2	Option 4	Existing	Option 1	Option 2	Option 4
Monroe Avenue & Inner Loop EB Ramps	B	INTERSECTION REMOVED			A	INTERSECTION REMOVED			B	INTERSECTION REMOVED			A	INTERSECTION REMOVED		
Monroe Avenue & Inner Loop WB Ramps	A	B	SAME AS OPTION 1		A	B	SAME AS OPTION 1		B	B	SAME AS OPTION 1		A	B	SAME AS OPTION 1	
Monroe Avenue & Union Street	B	SAME AS EXISTING			A	SAME AS EXISTING			B	SAME AS EXISTING			B	SAME AS EXISTING		
Union Street & Broad/Court Street	C	A	SAME AS OPTION 1		B	A	SAME AS OPTION 1		C	A	SAME AS OPTION 1		B	A	SAME AS OPTION 1	
Pitkin Street & Broad/Court Street	A	INTERSECTION REMOVED			B	INTERSECTION REMOVED			A	INTERSECTION REMOVED			B	INTERSECTION REMOVED		
Union Street & East Avenue	A	B	SAME AS OPTION 1		A	B	SAME AS OPTION 1		A	B	SAME AS OPTION 1		B	C	SAME AS OPTION 1	
Pitkin Street & East Avenue	B	INTERSECTION REMOVED			B	INTERSECTION REMOVED			B	INTERSECTION REMOVED			B	INTERSECTION REMOVED		
University Avenue & Union Street	A	B	B	B	B	B	B	B	A	A	B	B	B	B	B	B
Main Street & Union Street	B	C	B	B	B	B	C	C	B	B	B	B	C	C	C	C
Main Street & Inner Loop Ramps	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Main Street & University Avenue/Pitkin Street	B	B	B	C	B	B	B	C	B	B	B	C	B	B	B	C

Measure of Effectiveness

Synchro traffic analysis software provides a number of performance measures for comparison of network alternatives. Some of these measures include vehicle stops, delay, travel time, average speed and emissions. It should be noted that these measures represent the entire network evaluated including the free flow expressway traffic as well as the at grade signalized and unsignalized intersections. Performance measures, which are presented in the following table, where obtained on a simulated traffic network (60 minutes) during each peak hour for each alternative considered. The table shows that some network performance measures are better for some alternatives than for others. In some cases better than can be achieved under the No-Build option. This, in spite of the fact that raising the Inner Loop would result in higher traffic volumes generated by new adjacent development and that free flow traffic on existing Inner Loop would now have to travel through three (3) or four (4) at-grade traffic signal controlled intersections.

SimTraffic MOE's (60-minute Interval)

	AM Peak Hour					PM Peak Hour				
	Overall Inner Loop Area					Overall Inner Loop Area				
	Existing Conditions - 2008	No Build - 2035	Raised Inner Loop - Option 1 2035	Raised Inner Loop - Option 2 2035	Raised Inner Loop - Option 4 2035	Existing Conditions - 2008	No Build - 2035	Raised Inner Loop - Option 1 2035	Raised Inner Loop - Option 2 2035	Raised Inner Loop - Option 4 2035
Total Delay (hr)	132.8	170.8	191.3	336.3	472.2	162.1	311	**255.1**	385.6	432.6
Delay / Veh (s)	143.7	155.7	171.2	289.5	434.1	548	602.7	**452.3**	643.8	847.3
Stop Delay (hr)	108.6	136.6	152.8	298.3	432.4	126.5	263.3	**202.7**	331.6	373.9
Stop Delay / Veh (s)	117.6	124.5	136.7	256.8	397.5	427.5	510.1	**359.4**	553.7	732.3
Total Stops	13887	17691	18928	19463	21258	17571	22779	24151	24615	28271
Stop / Veh	4.18	4.48	4.7	4.65	5.43	16.5	12.26	**11.89**	**11.42**	15.38
Travel Dist. (mi)	3700.1	4438	4820.4	4668.8	4626.8	4938.3	5112	5680	5405.3	5463.5
Travel Time (hr)	271.7	335	367.9	509.1	644.5	345.2	497	**466.5**	587.6	637.4
Avg Speed (mph)	14	13	**14**	13	10	14	12	12	12	9
Fuel Used (gal)	175.7	210.3	226	251.1	282.3	227.6	266.2	270.8	291.3	302.3
Fuel Eff. (mpg)	21.1	21.1	**21.3**	18.6	16.4	21.7	19.2	**21**	19.1	18.1
HC Emissions (g)	2401	2818	3316	3581	3909	2418	2515	2716	**2493**	2536
CO Emissions (g)	78934	89440	95334	95621	101307	86888	87009	88298	**81856**	**81739**
NOx Emissions (g)	7656	8948	9839	9125	9270	8450	8707	9312	**8700**	**8660**

NOTE: - Bold represents the more efficient option in comparison to 2035 No-Build geometry.

Inner Loop Accident Analysis and Major Non-Standard Features

The existing Inner Loop consists of a number of non-standard highway features that could contribute to accidents within the corridor. These are:

1. What might be considered diamond interchanges at the Inner Loop with the intersections of East Avenue, Broad Street and Chestnut/Monroe Avenue (short section two traffic signals);

2. Blind slip ramps to the Inner Loop between Broad Street and Chestnut /Monroe Avenue;

3. The merge, weave section from the two lane on-ramp from southbound Chestnut Street to the two lane Inner Loop to reach the loop ramp to South Clinton Avenue, I-490 eastbound and I-490 westbound.

To determine if this is true for the eastern Inner Loop, an accident analysis was undertaken and the detailed analysis and accident diagrams are contained in Attachment B and summarized in the following table.

The table shows the locations experiencing accidents above state or county wide accident rates. These locations are highlighted in red for those exceeding the State-wide rates.

The detailed analysis of eastern Inner Loop mainline sections found the overall accident rate to be 2.48 accidents per million vehicle miles (acc/mvm), which is lower than the statewide accident rate of 2.72 acc/mvm for Principal Arterial Expressway. The majority of these accidents were found to occur along the horizontal curve between East Main Street and East Avenue. Thus, these sub-standard features do not appear to be causing an accident rate that would exceed those expected to be found on a Principal Arterial Expressway

Of the eleven (11) at-grade adjacent intersections examined in this analysis, only 3 intersections had an accident rate below the statewide accident rate and only 1 below the Monroe County average accident rate (East Main Street at University/Pitkin Street).

Further study will be required to determine if raising the Inner Loop will assist in reducing these intersection accidents, in particular the high proportion of right angle accidents on South Union Street at the intersections with Monroe Avenue, East Avenue and University Avenue. Consideration of the use of a Roundabout at the raised Inner Loop intersection, rather that traffic signal controlled intersections, would assist in eliminating right angle accidents at these intersections.

ACCIDENT RATES

Intersection	Number of Accidents	State/County Rate	Actual Rate	
Intersection Rate (excludes midblock accidents)				
East Main Street @ *University/Pitkin*	7	0.26 / 0.46	0.33	ACC/MEV
East Main Street @ *Inner Loop/University*	40	0.26 / 0.46	**0.96**	ACC/MEV
East Main Street @ *Union Street*	23	0.26 / 0.46	**0.83**	ACC/MEV
Pitkin Street @ *East Ave*	8	0.34 / 0.22	**0.44**	ACC/MEV
Pitkin Street @ *Broad Street*	4	0.34 / 0.22	**0.66**	ACC/MEV
Union Street @ *University Ave*	14	0.34 / 0.22	**0.65**	ACC/MEV
Union Street @ *East Ave*	17	0.34 / 0.22	**1.13**	ACC/MEV
Union Street @ *Broad St*	3	0.19 / 0.22	**0.71**	ACC/MEV
Monroe Avenue @ *Inner Loop/ Pitkin St.*	7	0.34 / 0.22	**0.26**	ACC/MEV
Monroe Avenue @ *Howell St.*	5	0.34 / 0.22	**0.34**	ACC/MEV
Monroe Avenue @ *South Union St.*	20	0.34 / 0.22	**1.12**	ACC/MEV
Link Rate				
Inner Loop - 940T *Rt. 490-E. Main St.*	30	2.72	2.48	ACC/MVM
I-490 *W.of River -E. of Clinton*	47	2.72	1.08	ACC/MVM

New I-490 Westbound Off-Ramp to the Inner Loop Traffic Volumes

Currently, westbound I-490 traffic has two alternatives to reach the east side of the Rochester CBD. First, is to use the Clinton Avenue northbound ramp directly into the heart of the CBD. Second, is to exit at Goodman Street and use Broadway Street and then South Union Street to reach the eastern Inner Loop area. For this second alternative, traffic using the Goodman Street off-ramp, will pass through five (5) traffic signal controlled intersections to reach this area. One of the alternatives to be considered under this study is to create an additional I-490 off-ramp, leading directly to the Inner Loop, which would divert traffic off of Broadway and South Union Street and provide a more direct access to the eastern CBD area.

To determine the volume of traffic that might use this new off-ramp, existing routes and future traffic volumes where reviewed. They show the following results:

Broadway to Union to the Eastern Inner Loop Area

Review of northbound traffic on Broadway Street would indicate that possibly around 200 to 300 might be from I-490 westbound during the morning peak hour and these vehicles might use a new westbound I-490 exit ramp to reach areas in the eastern Inner Loop Area (200 northbound through vehicles and 77 left turning vehicles onto Monroe Avenue). During the evening peak travel hour possibly around 150 to 200 vehicles might use this new ramp (100 northbound and 85 turning left to Monroe Avenue).

The traffic impact of this possible change is already included in the base analysis, except at the intersection of Monroe/Chestnut with the Inner Loop. This traffic already passes through or distributes itself to intersections on the northern section.

Diversion from South Clinton Avenue I-490 Westbound Exit

This ramp in the morning peak travel period accommodates over 2,000 vehicles per hour. The only real opportunity for this ramp to service traffic on the east side of the Inner Loop is to either turn right onto Woodbury Avenue or right onto Court Street (which provides access to both the Xerox and Midtown parking garages). The majority of parking that serves developments on the east side of the Inner Loop is located east of Chestnut, along Broad and Scio Streets. Thus, most of this traffic that might use a new I-490 eastbound off-ramp to the Inner Loop would most likely

travel on Clinton Avenue, turn right on Court Street, travel eastbound past Chestnut Street. The morning peak hour traffic making this movement is 234 vehicles, not all of which would be expected to be from Clinton Avenue. Thus, a rough estimate of traffic that is currently using the I-490 westbound off-ramp to Clinton Avenue that might be diverted to a new westbound off-ramp to the Inner Loop would most likely be in the neighborhood of 100 vehicles during either the morning or evening peak travel hour.

Total Diversion to a New I-490 westbound off-ramp to the Inner Loop

Based on the above rough analysis of possible peak hour diversions to a new I-490 off-ramp to the Inner Loop, this new ramp would be roughly estimated to attract between 300 to possibly 450 vehicles during the morning peak travel period and 300 to 400 vehicles during the evening peak travel hour.

Analysis of this traffic on a raised Inner Loop found that it would not have a notable impact. All intersections were found to continue to operate at LOS "C" with no turning movement below LOS "D".

Attachments

A – Inner Loop Study Area Analysis Memo, 9/23/08

B – Detailed Level of Service Table

C – Queuing Analysis Table

D – Accident Summary Memo 12/17/08

E – Synchro Analysis Files on CD

F – Agency Comments and Response

Memo

Stantec

To:	John Thomas City of Rochester	From:	William C. Holthoff Rochester (2250) NY Office
File:	Inner Loop 192500170	Date:	October 3, 2008

Inner Loop Study Area Analysis

This memo will serve to address concerns raised on the order of magnitude of the traffic impacts that may result from raising the eastern end of the Inner Loop. In particular, the effects on the expressway system and other arterials serving the Rochester Central Business District (CBD). If the projected traffic increases on other highway segments are of significance as a result of raising the Inner Loop, then the study area for this project would need to enlarge to address any traffic impacts that may directly result.

To address this concern, the Genesee Transportation Council (GTC) Regional Travel Forecasting Model was employed. The forecasting model was run with and without raising the Inner Loop for the year 2014. This year is being used to analyze all the different proposed land use changes within the CBD. The forecasted traffic volume along major segments of the highway system, with and without raising the Inner Loop was compared to determine traffic volume changes. These segments (see attached map) and traffic changes are shown in the attached tables.

Review of this comparison indicates the following:

Expressway System

The following expressway mainline sections were reviewed:

- I-490 on the east side and west side of the CBD;
- NY 590 between Blossom Road and Browncroft Boulevard; and,
- NY 104 between Carter Street and Portland Avenue.

The change in traffic ranged from an increase of +0.55% to a decrease of -0.56%. The largest volume change was a plus +27 vehicles to a -27 vehicles per hour. These in significant differences are due to random variations within the model instead of the result of raising the Inner Loop. Based on this, raising the Inner Loop would have no impact on these expressways or their associated interchanges.

Bridges

Both the Bausch Bridge and the Ford Street bridges over the Genesee River where compared. Traffic volume changes on the Bausch Street Bridge showed an increase of less than 2% (less than 15 vehicles per hour). On the Ford Street Bridge, changes in

traffic ranged from -0.5% (-6 vehicles) to +4.7% (+39 vehicles). These changes are also insignificant and may be the result of random model variations.

Arterial System

East Side

Forecasted traffic volumes where compared for Main Street, East Avenue and Monroe Avenue between Park Avenue and Goodman Street. The results show some minor impact as a result of raising the Inner Loop. The change in traffic volumes ranged from an increase of +15% to a decrease of -9.3%; however, the net change in east-west travel using these four arterials is reflective of an increase of 2% during the morning and evening peak travel hours.

North Side

Traffic volumes on Clinton Avenue between Woodbury Boulevard and East Broad Street where compared and the change in traffic volumes range from -0.17% to +2.3%. This is a minor traffic change as a result of raising the Inner Loop.

South Side

Traffic volumes on South Clinton Avenue and Mt. Hope Avenue between Byron Street and Alexander Street were reviewed. A significant decrease in traffic was identified for southbound traffic on South Clinton Avenue (-21%) and a minor reduction on Mt. Hope Avenue (-3.6%). Further review indicates this being a result of how the model was coded to reflect the raised Inner Loop. The loss of a coded slip ramp from Chestnut Street to the raised Inner Loop appears to have caused these reductions and redistribution of traffic to other routes south of the CBD. In reality, this would not occur, southbound drivers on Chestnut destined to locations south on South Clinton Avenue would continue to use the same ramp. Overall, raising the Inner Loop will have no notable impacts on the south side of the CBD. This minor coding change may also be responsible for changes (increases) on the east side of the Inner Loop and in other areas.

Conclusion

Review and comparison of the forecasted traffic in the year 2014, with and without raising the Inner Loop indicates the traffic impact will remain contained to the immediate adjacent area. Raising the Inner Loop will have no notable traffic impacts on the expressway system, their interchanges, or on major arterials surrounding or serving the Rochester CBD. Thus, the study area for determining the traffic impacts is at the intersections with the Inner Loop and those immediately adjacent to them.

STANTEC CONSULTING SERVICES INC.

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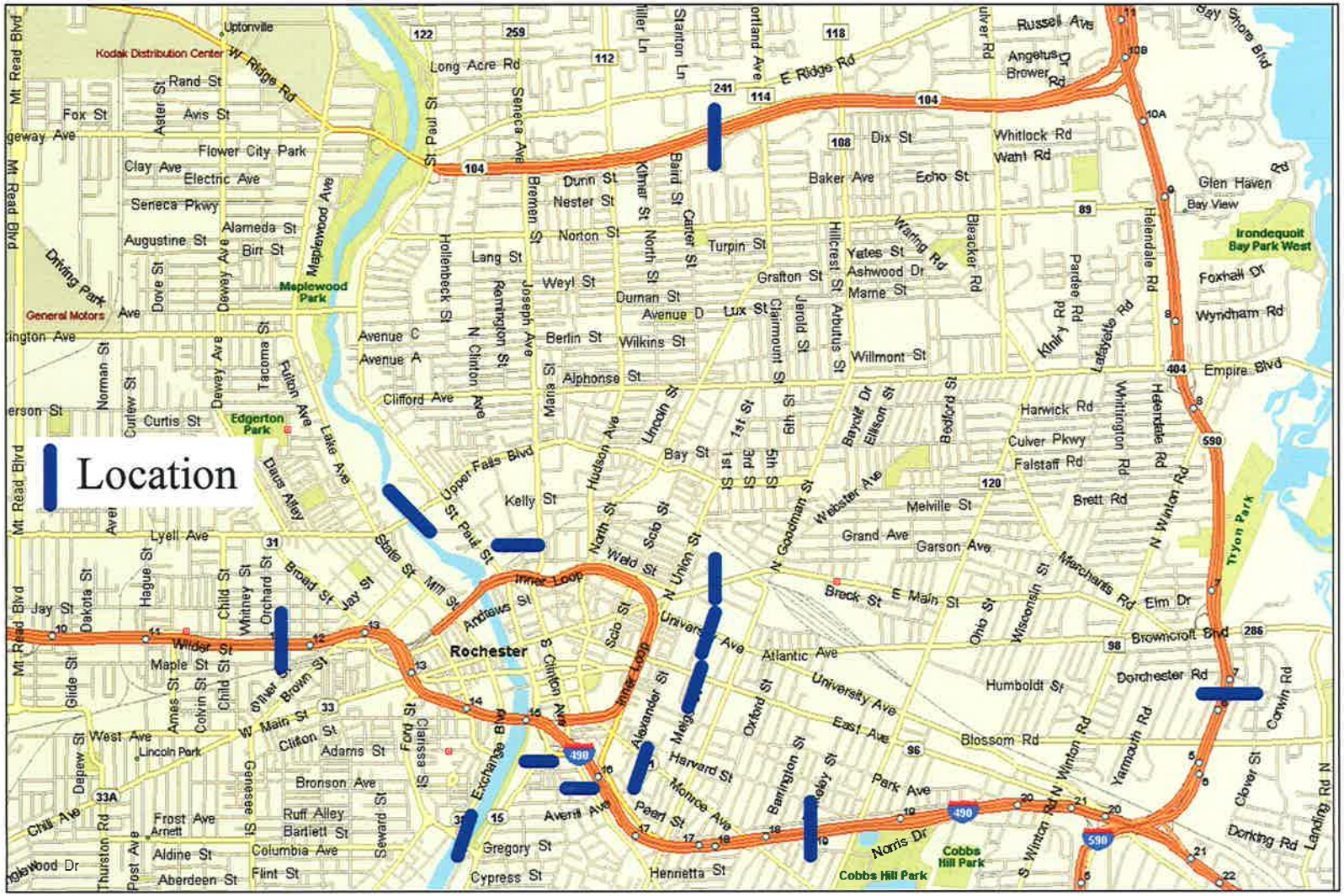
Memo

Stantec

Inner Loop Volume Comparison Locations (2014)
With and Without Raising the Inner Loop



Intersection	Approach & Movement	2008									
		AM					PM				
		Existing	Option 1	Option 2	Option 3	Option 4	Existing	Option 1	Option 2	Option 3	Option 4
Monroe Avenue & Inner Loop EB Ramps	NB THRU/RT	A	INTERSECTION REMOVED				A	INTERSECTION REMOVED			
	SB LT/THRU	A					A				
	EB THRU/LT	C					D				
	EB RT	A					B				
	OVERALL	**B**					**A**				
Monroe Avenue & Inner Loop WB Ramps	NB LT	A	B	SAME AS OPTION 1			A	B	SAME AS OPTION 1		
	NB THRU/RT	A	B				A	B			
	SB LT		A					C			
	SB THRU	B	B				A	C			
	SB RT		A					A			
	EB LT		B					B			
	EB THRU		C					C			
	EB RT		A					A			
	WB LT	-	B				-	B			
	WB THRU	C	D				D	B			
	WB RT	-	A				-	A			
	OVERALL	**A**	**B**				**A**	**B**			
Monroe Avenue & Union Street	NEB LT	C	SAME AS EXISTING				C	SAME AS EXISTING			
	NEB THRU	C					C				
	SEB LT	B					A				
	SEB THRU	B					A				
	NWB THRU	B					A				
	NWB RT	A					A				
	OVERALL	**B**					**A**				
Union Street & Broad/Court Street	NB LT	D	A	SAME AS OPTION 1			D	A	SAME AS OPTION 1		
	NB THRU	C	A				C	A			
	SB THRU		B					A			
	EB LT	A	B				A	A			
	EB RT		A					B			
	OVERALL	**C**	**A**				**B**	**A**			
Pitkin Street & Broad/Court Street	SB LT	-	INTERSECTION REMOVED				-	INTERSECTION REMOVED			
	SB THRU	B					C				
	EB THRU	A					A				
	EB RT	A					A				
	WB LT/THRU	A					A				
	OVERALL	**A**					**B**				
Union Street & East Avenue	NB THRU/LT	C	A	SAME AS OPTION 1			C	A	SAME AS OPTION 1		
	NB RT	B	B				B	C			
	SB LT		A					B			
	SB THRU		B					B			
	EB THRU	A	B				A	B			
	WB THRU	A	B				B	B			
	OVERALL	**A**	**B**				**A**	**B**			
Pitkin Street & East Avenue	SB LT	D	INTERSECTION REMOVED				D	INTERSECTION REMOVED			
	SB THRU	C					C				
	EB THRU	B					B				
	EB RT	A					A				
	WB THRU	A					A				
	OVERALL	**B**					**B**				

Intersection	Approach & Movement	2035									
		AM					PN				
		Existing	Option 1	Option 2	Option 3	Option 4	Existing	Option 1	Option 2	Option 3	Option 4
Monroe Avenue & Inner Loop EB Ramps	NB THRU/RT	B	INTERSECTION REMOVED				A	INTERSECTION REMOVED			
	SB LT/THRU	A					A				
	EB THRU/LT	C					D				
	EB RT	A					B				
	OVERALL	**B**					**A**				
Monroe Avenue & Inner Loop WB Ramps	NB LT	A	C	SAME AS OPTION 1			A	B	SAME AS OPTION 1		
	NB THRU/RT	B	B				A	A			
	SB LT		B					D			
	SB THRU	B	B				A	D			
	SB RT		A					A			
	EB LT		C					C			
	EB THRU		C					D			
	EB RT		A					A			
	WB LT	-	C				-	C			
	WB THRU	C	C				D	D			
	WB RT	-	A				-	B			
	OVERALL	**B**	**B**				**A**	**B**			
Monroe Avenue & Union Street	NEB LT	B	SAME AS EXISTING				D	SAME AS EXISTING			
	NEB THRU	B					D				
	SEB LT	B					A				
	SEB THRU	B					A				
	NWB THRU	B					B				
	NWB RT	A					A				
	OVERALL	**B**					**B**				
Union Street & Broad/Court Street	NB LT	D	A	SAME AS OPTION 1			D	A	SAME AS OPTION 1		
	NB THRU	C	A				C	A			
	SB THRU		B					B			
	EB LT	A	B				A	B			
	EB RT		A					A			
	OVERALL	**C**	**A**				**B**	**A**			
Pitkin Street & Broad/Court Street	SB LT	-	INTERSECTION REMOVED				C	INTERSECTION REMOVED			
	SB THRU	A					C				
	EB THRU	A					A				
	EB RT	A					A				
	WB LT/THRU	A					A				
	OVERALL	**A**					**B**				
Union Street & East Avenue	NB THRU/LT	C	A	SAME AS OPTION 1			C	A	SAME AS OPTION 1		
	NB RT	B	B				B	C			
	SB LT		A					C			
	SB THRU		B					B			
	EB THRU	A	B				A	C			
	WB THRU	A	C				C	C			
	OVERALL	**A**	**B**				**B**	**C**			
Pitkin Street & East Avenue	SB LT	D	INTERSECTION REMOVED				D	INTERSECTION REMOVED			
	SB THRU	C					C				
	EB THRU	B					B				
	EB RT	A					A				
	WB THRU	A					A				
	OVERALL	**B**					**B**				

Intersection	Approach & Movement	2008										2035									
		AM					PM					AM					PN				
		Existing	Option 1	Option 2	Option 3	Option 4	Existing	Option 1	Option 2	Option 3	Option 4	Existing	Option 1	Option 2	Option 3	Option 4	Existing	Option 1	Option 2	Option 3	Option 4
University Avenue & Union Street	NB LT	B	C	C	B	B	C	C	C	B	B	B	C	C	B	B	C	C	C	B	B
	NB THRU/RT	B	C	B	B	B	C	B	B	B	B	B	B	B	B	B	C	B	B	B	B
	SB LT				A	A				B	B				B	B				D	D
	SB THRU/RT				A	A				A	A				A	A				A	A
	EB THRU	A	A	A	B	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	EB RT			A					A					A					A		
	WB LT/TH/RT	A	B	A	B	C	A	A	C	A	C	A	A	A	B	C	A	A	C	B	C
	OVERALL	**A**	**B**	**B**	**B**	**B**	**B**	**B**	**B**	**A**	**B**	**A**	**A**	**B**	**B**	**B**	**B**	**B**	**B**	**B**	**B**
Main Street & Union Street	NB LT	D	D				D	D				D	D				D	D			
	NB THRU/RT	C	D	C		C	C	C	C		B	C	C	C		C	D	D	D		C
	SB LT/RT	B	C	B	B	B	B	B	B	B	B	B	B	B	B	A	B	B	C	B	B
	EB LT	A	A	A	A	A	A	A	A	B	A	A	A	A	B	B	A	A	A	B	A
	EB THRU	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	WB THRU	C	D	C	C	C	C	C	D	D	D	C	C	C	C	C	D	D	D	D	D
	WB RT				B	B				C	C				B	B				C	C
	OVERALL	**B**	**C**	**B**	**B**	**B**	**B**	**B**	**C**	**C**	**C**	**B**	**B**	**B**	**B**	**B**	**C**	**C**	**C**	**C**	**C**
Main Street & Inner Loop Ramps	NB LT	C	D	D			D	D	D			D	D	D			D	D	D		
	NB THRU	C	D	D	D	D	C	C	D	D	D	C	C	D	D	D	D	D	D	D	D
	NB RT				A					B					A					C	
	SB LT	D	D	C	C	C	D	D	C	C	C	D	D	D	C	C	D	D	D	C	C
	SB THRU/RT	D	D	C	C	C	C	C	C	C	C	D	D	D	C	C	D	D	D	D	D
	EB LT	C	C	B	C	C	B	B	B	C	C	C	C	C	C	C	B	B	B	C	C
	EB THRU	C	C	B	C	C	B	B	B	C	C	C	C	B	B	C	B	B	B	C	C
	EB RT	A	A	A			A	A	A			A	A	A			A	A	A		
	WB LT			A	A	A			B	B	B			A	A	B			B	C	C
	WB THRU	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B	B	A	A	A
	WB RT	A	A				A	A				A	A				A	A			
	OVERALL	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**
Main Street & University Avenue/Pitkin Street	NB LT/TH/RT				D	D				C	D				D	D				D	D
	SB LT	D	D	D	D	D	C	C	C	D	D	D	D	D	D	D	C	C	C	D	D
	SB THRU/RT	D	D	D	D	D	B	B	B	D	D	D	D	D	D	D	B	B	B	D	D
	EB LT	B	C	B			B	B	B			B	B	B			C	C	B		
	EB THRU	C	C	C	B	B	C	C	B	B	B	C	C	C	C	C	C	C	B	B	B
	EB RT				C	C				B	C				C	C				C	C
	WB LT	A	A	A			A	A	A			A	A	A			A	A	A		
	WB THRU	A	A	A	A	A	A	A	A	B	B	A	A	A	B	B	A	A	A	B	B
	WB RT	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	OVERALL	**B**	**B**	**B**	**C**	**C**	**B**	**B**	**B**	**C**	**C**	**B**	**B**	**B**	**C**	**C**	**B**	**B**	**B**	**C**	**C**

Intersection	Approach & Movement	2008										2035									
		AM					PM					AM					PN				
		Existing	Option 1	Option 2	Option 3	Option 4	Existing	Option 1	Option 2	Option 3	Option 4	Existing	Option 1	Option 2	Option 3	Option 4	Existing	Option 1	Option 2	Option 3	Option 4
Monroe Avenue & Inner Loop EB Ramps	**OVERALL**	B	INTERSECTION REMOVED				A	INTERSECTION REMOVED				B	INTERSECTION REMOVED				A	INTERSECTION REMOVED			
Monroe Avenue & Inner Loop WB Ramps	**OVERALL**	A	B	SAME AS OPTION 1			A	B	SAME AS OPTION 1			B	B	SAME AS OPTION 1			A	B	SAME AS OPTION 1		
Monroe Avenue & Union Street	**OVERALL**	B	SAME AS EXISTING				A	SAME AS EXISTING				B	SAME AS EXISTING				B	SAME AS EXISTING			
Union Street & Broad/Court Street	**OVERALL**	C	A	SAME AS OPTION 1			B	A	SAME AS OPTION 1			C	A	SAME AS OPTION 1			B	A	SAME AS OPTION 1		
Pitkin Street & Broad/Court Street	**OVERALL**	A	INTERSECTION REMOVED				B	INTERSECTION REMOVED				A	INTERSECTION REMOVED				B	INTERSECTION REMOVED			
Union Street & East Avenue	**OVERALL**	A	B	SAME AS OPTION 1			A	B	SAME AS OPTION 1			A	B	SAME AS OPTION 1			B	C	SAME AS OPTION 1		
Pitkin Street & East Avenue	**OVERALL**	B	INTERSECTION REMOVED				B	INTERSECTION REMOVED				B	INTERSECTION REMOVED				B	INTERSECTION REMOVED			
University Avenue & Union Street	**OVERALL**	A	B	B	B	B	B	B	B	A	B	A	A	B	B	B	B	B	B	B	B
Main Street & Union Street	**OVERALL**	B	C	B	B	B	B	B	C	C	C	B	B	B	B	B	C	C	C	C	C
Main Street & Inner Loop Ramps	**OVERALL**	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Main Street & University Avenue/Pitkin Street	**OVERALL**	B	B	B	C	C	B	B	B	C	C	B	B	B	C	C	B	B	B	C	C

Queue Analysis

Intersection	Approach & Movement	Existing Storage Length (ft)	Proposed Storage Length (ft)				2008								2035				
							Existing Queue Length, Synchro (ft)		Observed Queue Length (ft)		Proposed Queue Length (ft)				Proposed Queue Length (ft)				
			Option 1	Option 2	Option 3	Option 4	AM	PM	AM	PM	Option 1	Option 2	Option 3	Option 4	Existing	Option 1	Option 2	Option 3	Option 4
Monroe Avenue & Inner Loop EB Ramps	NB THRU	-	INTERSECTION REMOVED				90	125	75	200	INTERSECTION REMOVED				190	INTERSECTION REMOVED			
	NB THRU/RT	75					90	125	25	75					190				
	SB LT/THRU	100					45	0	-	-					60				
	EB LT	-					120	70	100	100					190				
	EB THRU	-					65	50	50	50					50				
	EB RT	200					65	50	50	50					50				
Monroe Avenue & Inner Loop WB Ramps	NB LT	100	150	SAME AS OPTION 1			60	35	-	50	110	SAME AS OPTION 1			100	150	SAME AS OPTION 1		
	NB THRU	100	-				65	35	-	-	80				120	140			
	NB THRU/RT		150								80					140			
	SB LT		120								60					85			
	SB THRU-RT	-	-				65	70	50	175	120				130	230			
	EB LT		200								65					150			
	EB THRU		-								170					250			
	EB RT		-								40					50			
	WB LT	-	200				-	-	100	175	70				-	100			
	WB THRU	-	-				45	85	75	100	170				85	260			
	WB RT	-	200				-	-	-	-	20				-	30			
Monroe Avenue & Union Street	NEB LT	100	SAME AS EXISTING				55	80	125	50	SAME AS EXISTING				110	SAME AS EXISTING			
	NEB THRU	-					125	95	50	125					120				
	SEB LT	75					25	25	?	?					25				
	SEB THRU	-					300	195	125	300					480				
	NWB THRU	-					180	40	100	100					220				
	NWB RT	50					25	0	25	-					40				
Union Street & Broad/Court Street	NB LT	-	200	SAME AS OPTION 1			150	60	100	75	25	SAME AS OPTION 1			150	30	SAME AS OPTION 1		
	NB THRU	-	-				70	60	75	50	60				70	90			
	SB THRU		-								100					140			
	EB LT	100	-				0	25	0	-	50				20	80			
	EB RT		100								40					40			
Pitkin Street & Broad/Court Street	SB LT	-	INTERSECTION REMOVED				-	-	50	50	INTERSECTION REMOVED				90	INTERSECTION REMOVED			
	SB THRU	-					25	80	50	50					90				
	EB THRU	-					30	25	0	?					50				
	EB RT	100					30	0	-	?					50				
	WB LT/THRU	100					0	25	-	-					40				
Union Street & East Avenue	NB LT	-	150	SAME AS OPTION 1			85	65	75	50	25	SAME AS OPTION 1			100	30	SAME AS OPTION 1		
	NB THRU	-	-				85	65	75	50	180				100	240			
	NB RT	-					0	25	50	50	180				70				
	SB LT		-								90					160			
	SB THRU		-								100					110			
	EB THRU	-	-				0	0	50	-	130				10	320			
	WB THRU	-	-				40	110	50	100	130				160	230			
Pitkin Street & East Avenue	SB LT	-	INTERSECTION REMOVED				160	190	250	275	INTERSECTION REMOVED				210	INTERSECTION REMOVED			
	SB THRU	-					80	60	175	150					90				
	EB THRU	-					45	100	50	100					160				
	EB RT	75					25	0	?	?					20				
	WB THRU	-					0	30	50	25					30				

Queue Analysis

Intersection	Approach & Movement	Existing Storage Length (ft)	Proposed Storage Length (ft)				2008								2035				
							Existing Queue Length, Synchro (ft)		Observed Queue Length (ft)		Proposed Queue Length (ft)				Proposed Queue Length (ft)				
			Option 1	Option 2	Option 3	Option 4	AM	PM	AM	PM	Option 1	Option 2	Option 3	Option 4	Existing	Option 1	Option 2	Option 3	Option 4
University Avenue & Union Street	NB LT	220	220	300	200	220	75	200	175	125	170	360	80	80	220	200	400	90	90
	NB THRU/RT	220	220	-	-	-	75	125	175	175	100	90	170	190	150	130	110	230	230
	SB LT				200	200							100	100				280	280
	SB THRU/RT				200	200							50	50				40	40
	EB THRU	200	200	200	250	250	35	75	75	175	75	70	0	0	90	95	80	0	0
	EB RT			250	250	250						-					-		
	WB LT/TH/RT	-	-	-	-	-	25	60	***	75	110	200	120	230	70	70	260	160	250
Main Street & Union Street	NB LT	250	250	250		250	25	25	50	50	15				25	25			
	NB THRU	250	250	250		250	80	100	125	150	100	100		160	140	140	140		190
	NB RT	250	250	250		250	80	100	125	150	100			80	140	140			170
	SB LT/RT	-	-	200	200	200	65	60	50	150	70	70	70	70	70	70	80	80	70
	EB LT	75	75	50	75	75	25	25	?	75	10	10	70	10	20	20	10	90	10
	EB THRU	125	125	125	125	125	25	25	50	200	20	10	60	10	40	40	40	80	25
	WB THRU	-	-	-	-	-	260	425	~250	425	430	460	430	430	590	610	550	530	530
	WB RT				50								70	70				80	80
Main Street & Inner Loop Ramps	NB LT	200	200	200	200	200	210	185	***	250	190	220			250	280	250		
	NB THRU	200	200	200	200	200	190	175	***	250	180	220	190	220	220	230	340	270	270
	NB RT				200								80					140	
	SB LT	175	175	250	250	250	270	250	225	350	270	180	170	170	320	340	220	200	210
	SB THRU/RT	-	-	-	-	-	235	225	225	200	240	200	210	210	270	280	250	240	240
	EB LT	75	75	125	125	125	25	25	-	100	15	20	20	20	15	15	20	25	25
	EB THRU	200	200	200	200	200	75	95	100	150	90	100	70	70	110	110	120	80	80
	EB RT	-	-	-			30	30	-	100	30	90			50	50	100		
	WB LT			90	100	90						25	25	25			25	25	25
	WB THRU	150	150	150	150	150	45	50	75	75	70	0	0	0	70	80	10	20	30
	WB RT	-	-				140	0	-	75	80				130	130			
Main Street & University Avenue/Pitkin Street	NB LT/TH/RT				220	220							110	120				140	140
	SB LT	150	150	150	150	150	90	90	50	175	90	100	90	130	110	110	130	140	140
	SB THRU/RT	-	-	-	-	-	25	35	25	75	40	20	80	100	50	50	25	110	110
	EB LT	50	50	100	-	-	25	25	25	-	25	15			25	30	15		
	EB THRU	-	-	-	-	-	110	200	75	150	200	110	80	80	250	260	120	90	90
	EB RT				100	130							90	110				160	160
	WB LT	100	100	200	200	200	25	25	50	75	20	40	60		30	30	35	60	70
	WB THRU	200	200	200	200	200	25	25	50	75	30	40	60	60	50	40	35	60	70
	WB RT	200	200	200	200	200	0	0	-	-	0	0	20	25	0	0	0	30	30

NOTE:

*** = Utility Truck had the right most lane closed while new overhead signs were installed. This created a large backup through the Alexander Street Intersection

= Thru lane Queue is greater than 200'.

= Turn Lane / Thru Lane exceeds storage length and is blocking other traffic

Memo

Inner Loop – *Accident History*

Stantec

	December 17, 2008
Date:	Revised April 24, 2009
To:	Bill Holthoff, Stantec
From:	Paula Benway, Stantec

Inner Loop Accident Data

The most recent available accident information was obtained for the section of the inner loop from the Rt. 490 interchange in the east to north of the East Main Street interchange. Information available represents a 39-month period between January 1, 2005 and March 7, 2008. The accident history identified a total of 49 accidents occurred along the Inner Loop in this area. The reportable accidents accounted for 30 (61%) of the total accidents and the non-reportable accidents accounted for 19 (39%) of the total accidents. The following list summarizes the types and number of reportable accidents. The rest of the assessment (analysis, rates and potential corrective action) will be related to the reportable type accidents that occurred in the corridor.

- Fixed Object – 17 (57%)
- Sideswipe – 5 (17%)
- Rear End – 4 (13%)
- Right Angle – 1 (3%)
- Head-on – 1 (3%)
- Unknown – 2 (7%)

The accident severity included 13 injuries (43%) and 17 (57%) property damage only. Fifty three percent of all accidents occurred during evening hours with 55% occurring on dry pavement conditions. Seventy percent of the vehicles involved were traveling in a westerly direction. As indicated above, 57% of the accidents involved collision with fixed objects (guide rail, curbing, abutment, debris). Only four of the 30 accidents occurred at a merge/diverge ramp location, with the majority of accidents occurring main line along the horizontal curve between East Main Street and East Avenue. The accident rate for the corridor was calculated and compared to statewide accident rates for Principal Arterial expressways. The current accident rate is 2.48 accidents per million vehicle miles (acc/mvm) which is below the statewide average of 2.72 acc/mvm.

Collision diagrams, detailed accident history, and rate calculations are attached.

Extended Study Area

An extended study area was also reviewed that included at grade adjacent corridors including: East Main Street, Monroe Avenue/Chestnut, Pitkin Street, Union Street, and a portion of Interstate 490. The following table summarizes the number of reportable accidents and the calculated accident rates for the corridor and intersections for each of these adjacent roadways.

ACCIDENT RATES

Intersection	Number of Accidents	State/County Rate	Actual Rate	
Intersection Rate (excludes midblock accidents)				
East Main Street @ *University/Pitkin*	7	0.26 / 0.46	0.33	ACC/MEV
East Main Street @ *Inner Loop/University*	40	0.26 / 0.46	**0.96**	ACC/MEV
East Main Street @ *Union Street*	23	0.26 / 0.46	**0.83**	ACC/MEV
Pitkin Street @ *East Ave*	8	0.34 / 0.22	**0.44**	ACC/MEV
Pitkin Street @ *Broad Street*	4	0.34 / 0.22	**0.66**	ACC/MEV
Union Street @ *University Ave*	14	0.34 / 0.22	**0.65**	ACC/MEV
Union Street @ *East Ave*	17	0.34 / 0.22	**1.13**	ACC/MEV
Union Street @ *Broad St*	3	0.19 / 0.22	**0.71**	ACC/MEV
Monroe Avenue @ *Inner Loop/ Pitkin St.*	7	0.34 / 0.22	**0.26**	ACC/MEV
Monroe Avenue @ *Howell St.*	5	0.34 / 0.22	**0.34**	ACC/MEV
Monroe Avenue @ *South Union St.*	20	0.34 / 0.22	**1.12**	ACC/MEV
Link Rate				
Inner Loop - 940T *Rt. 490-E. Main St.*	30	2.72	2.48	ACC/MVM
I-490 *W.of River -E. of Clinton*	47	2.72	1.08	ACC/MVM

Locations experiencing above state or county wide accident rates are highlighted in red. Both sections of the expressway system (Inner Loop and I-490) are experiencing accident occurrences below the average rates. Each of the adjacent corridors is further assessed below.

Corridor Breakdown

East Main Street corridor– 80 accidents occurred over a 41-month period from University Avenue in the west to Union Street in the east. There were 27(35%) rear-end accidents, 18(23%) sideswipe, 15(20%) right angle, 6(8%) overtaking, 7(8%) left turn, 2(2%) fixed object, 1 backing, 1 bicycle and 2(2%) unknown accidents that occurred at the three intersections along East Main Street. The severity of these accidents included 15(19%) injuries and 65(81%) property damage only. Seventy four percent of all accidents occurred during daylight hours with 70% occurring on dry pavement conditions. The East Main Street intersections with the Inner Loop/University Avenue and the Union Street intersection are experiencing accident rates above the state/county wide average rates. The Monroe County Department of Transportation investigated East Main Street east of Union Street in July 2006 as part of a PIL. The investigation resulted in traffic signal

timing changes that improved the progression on East Main Street.

Inner Loop/University Intersection – of the 40 accidents that occurred at this intersection, 13(33%) were vehicles sideswiping/overtaking in the left turn lanes on the Inner Loop ramp approach and the University Avenue approach. These accidents are attributable to driver confusion, inattention to turning maneuvers, unsafe lane change or possible narrow lane widths. The other major accident type occurring at this intersection is rear-end accidents 13 (33%) of the total; driver inattention is noted as a contributing factor.

North Union Street Intersection – of the 23 accidents that occurred at this intersection, 8(35%) were vehicles sideswiping/overtaking on the North Union Street northbound approach and the East Main Street westbound approach. These accidents are attributable to driver confusion, inattention to turning maneuvers, unsafe lane changes or possible narrow lane widths. The other major accident type occurring at this intersection is rear-end accidents 8 (35%) of the total; driver inattention is noted as a contributing factor.

Monroe Avenue/Chestnut corridor – 50 accidents occurred over a 41-month period along the section from Chestnut north of Inner Loop to South Union Street intersection to the south. There were 20 (40%) rear-end accidents, 11(22%) right angle, 6(12%) sideswipe, 4(8%) right turn, 3(6%) fixed object, 2(4%) left turn, 1(2%) head on, 1(2%) bicycle, 1(2%) driveway and 1 unknown accident. The severity of these accidents included 66% property damage only, 32% resulted in injuries and one fatality (motorcycle) did occur. Sixty two percent of the accidents occurred during daylight hours, and with 68% occurring on dry pavement conditions. The South Union intersection with Monroe Avenue is experiencing an accident rate above the state/county wide average.

South Union Intersection – of the 20 accidents that occurred at this intersection, 8(40%) were right angle accidents with the South Union approach. These accidents are attributable to driver inattention and visibility constraints. The other major accident type occurring at this intersection is rear-end accidents 7 (35%) of the total; driver inattention is noted as a contributing factor.

Pitkin Street corridor – 12 accidents occurred over a 29-month period. There were 5(42%) rear-end accidents, 3(25%) right angle, 1(8%) right turn, 1(8%) overtaking, 1(8%), pedestrian, 1(8%) unknown accident. Ninety two percent of the accidents involved property damage only, with 58% occurring during daylight hours, and with 58% occurring on dry pavement conditions. The East Avenue and Broad Street intersections with Pitkin Street are experiencing accident rates above the state/county wide average rates. Review of the accidents occurring at either intersection does not show a predominant accident pattern.

Union Street corridor – 61 accidents occurred over a 39-month period. There were 21(34%) right angle, 12(20%) rear-end, 10(16%) left turn, 4(6%) backing up, 3(5%) sideswipe, 3(5%) fixed object, 3(5%) right turn, 3(5%) unknown, 1 driveway and 1 overtaking accident. Eighty four percent of the accidents involved property damage only, and evenly distributed during daylight/evening hours, and with 74% occurred on dry pavement conditions. Further review of the actual reports suggests that the rear end accidents were primarily a result of following too closely. The University Avenue and East Avenue intersections with Union Street are experiencing accident rates above the state/county wide average rates.

University Avenue Intersection – of the 14 accidents that occurred at this intersection,

8(57%) were right angle accidents. These accidents are attributable to driver inattention and possible visibility constraints.

East Avenue Intersection – of the 17 accidents that occurred at this intersection, 12(71%) were right angle accidents. These accidents are attributable to driver inattention and possible visibility constraints related to bridge railing over the Inner Loop and building on the southeast quadrant.

I-490 corridor – 47 accidents occurred over a 33-month period. The 47 accidents consisted of 18(38%) fixed object accidents, 16(34%) rear-end, 8(17%) overtaking, 3(6%) unknown, 1 head-on and 1 sideswipe accident. The accident severity included 16(34%) injuries and 31(66%) property damage only. Sixty six percent of the accidents occurred during daylight hours, and with 60% occurring on dry pavement conditions. The majority of fixed object accidents involved unsafe travel speeds for the conditions (wet, construction, grade, or curvature of road). It should be noted that sections of I-490 included in this assessment was under construction during the time represented by this safety assessment. As such, caution should be used in review or interpretation of the findings.

STANTEC CONSULTING SERVICES INC.

Attachments: Accident Rate Calculations, Collision Diagrams, Detailed Accident History

ACCIDENT RATE CALCULATIONS

Project Name: **Inner Loop**
Date: 12/10/2008

Intersection Rate

(excludes midblock accidents)

	# Accidents	x	Per Million Entering Vehicles			=		=		
East Main Street @ ***University Ave/Pitkin***	7	x	1,000,000			=	7000000	=	**0.33**	**ACC/MEV**
	16,950	x	3.4	x	365		21034950		0.26	Statewide Rate
	Vehicles/Day		*# of Years*		*Days/Year*				0.46	County Rate
Inner Loop/University	40	x	1,000,000			=	40000000	=	**0.96**	**ACC/MEV**
	33,450	x	3.4	x	365		41511450		0.26	Statewide Rate
	Vehicles/Day		*# of Years*		*Days/Year*				0.46	County Rate
Union Street	23	x	1,000,000			=	23000000	=	**0.83**	**ACC/MEV**
	22,350	x	3.4	x	365		27736350		0.26	Statewide Rate
	Vehicles/Day		*# of Years*		*Days/Year*				0.46	County Rate
Pitkin Street @ ***East Ave***	8	x	1,000,000			=	8000000	=	**0.44**	**ACC/MEV**
	16,450	x	3	x	365		18012750		0.34	Statewide Rate
	Vehicles/Day		*# of Years*		*Days/Year*				0.22	County Rate
Broad Street	4	x	1,000,000			=	4000000	=	**0.66**	**ACC/MEV**
	5,550	x	3	x	365		6077250		0.34	Statewide Rate
	Vehicles/Day		*# of Years*		*Days/Year*				0.22	County Rate
Union Street @ ***University Ave***	14	x	1,000,000			=	14000000	=	**0.65**	**ACC/MEV**
	19,600	x	3	x	365		21462000		0.34	Statewide Rate
	Vehicles/Day		*# of Years*		*Days/Year*				0.22	County Rate
East Ave	17	x	1,000,000			=	17000000	=	**1.13**	**ACC/MEV**
	13,700	x	3	x	365		15001500		0.34	Statewide Rate
	Vehicles/Day		*# of Years*		*Days/Year*				0.22	County Rate
Broad St	3	x	1,000,000			=	3000000	=	**0.71**	**ACC/MEV**
	3,850	x	3	x	365		4215750		0.19	Statewide Rate
	Vehicles/Day		*# of Years*		*Days/Year*				0.22	County Rate
Monroe Avenue @ ***Inner Loop/ Pitkin St.***	7	x	1,000,000			=	7000000	=	**0.26**	**ACC/MEV**
	21,310	x	3.4	x	365		26445710		0.34	Statewide Rate
	Vehicles/Day		*# of Years*		*Days/Year*				0.22	County Rate
Howell St.	5	x	1,000,000			=	5000000	=	**0.34**	**ACC/MEV**
	11,750	x	3.4	x	365		14581750		0.34	Statewide Rate
	Vehicles/Day		*# of Years*		*Days/Year*				0.22	County Rate
South Union St.	20	x	1,000,000			=	20000000	=	**1.12**	**ACC/MEV**
	14,400	x	3.4	x	365		17870400		0.34	Statewide Rate
	Vehicles/Day		*# of Years*		*Days/Year*				0.46	County Rate

Total Link Rate

(All midblock & intersection accidents)

Inner Loop - 940T
Rt. 490-E. Main St.

# Accidents	x	Per Million Entering Vehicles							=		=		
30	x	1,000,000							=	30000000	=	**2.48**	**ACC/MVM**
1	x	10,200	x	3.25	x	365				12099750		2.72	Statewide Rate
Length (miles)		*Vehicles/Day*		*# of Years*		*Days/Year*						0.00	County Rate

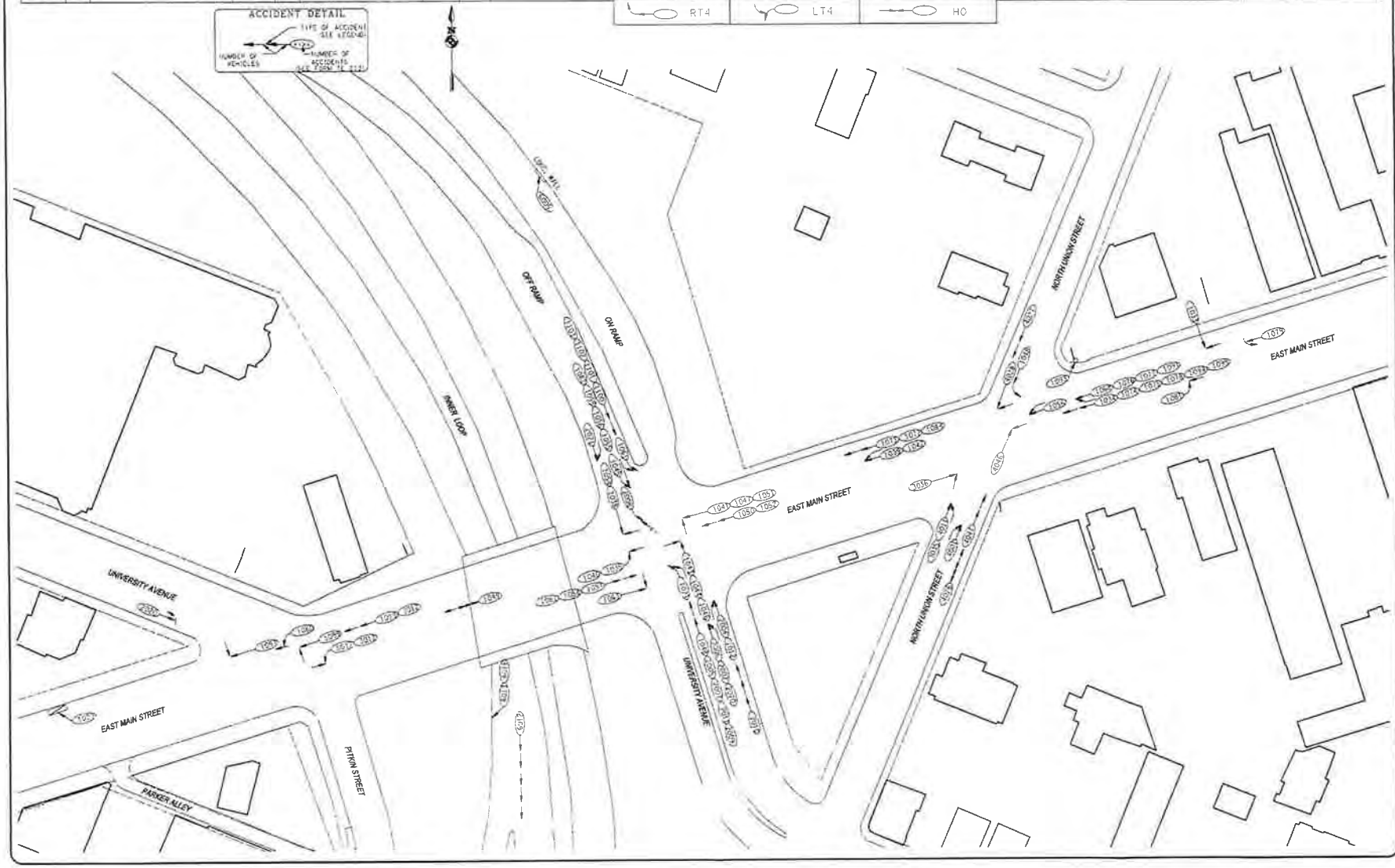
I-490
W.of River -E. of Clinton

# Accidents	x	Per Million Entering Vehicles							=		=		
47	x	1,000,000							=	47000000	=	**1.08**	**ACC/MVM**
0.5	x	86,970	x	2.75	x	365				43648069		2.72	Statewide Rate
Length (miles)		*Vehicles/Day*		*# of Years*		*Days/Year*						0.00	County Rate

ACCIDENT SYMBOLS LEGEND

	V	VEHICLE		FI	FATAL INJURY		FO	FIXED OBJECT
	MV	MOVING VEHICLE		P	PEDESTRIAN		SP	SIGN POST
	BV	BACKING VEHICLE		B	BICYCLE		TR	TREE
	PV	PARKED VEHICLE		M	MOTORCYCLE		UP	UTILITY POLE
	SV	STOPPED VEHICLE		D	DEER		GR	GUIDE RAIL
	NF1	NON-FATAL INJURY		BB	BLACK BEAR		CB	CONCRETE BARRIER

RT	LT	LT5	RANG	SS	HOSS
RT1	LT1	LT6	VFO	SKID	RE
RT2	LT2	OCC	VSP	VGR	DSS
RT3	LT3	OT	VTR	VUP	VCB
RT4	LT4	HO			



STANTEC CONSULTING SERVICES INC
2290 Brighton Henrietta Tl. RD
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Fax (585) 427-9174
www.stantec.com

PROJECT: INNER LOOP IMPROVEMENT PROJECT SCIO STREET TO CLINTON AVENUE
CITY OF ROCHESTER, NEW YORK

TITLE OF DRAWING: ACCIDENT COLLISION DIAGRAM PLAN

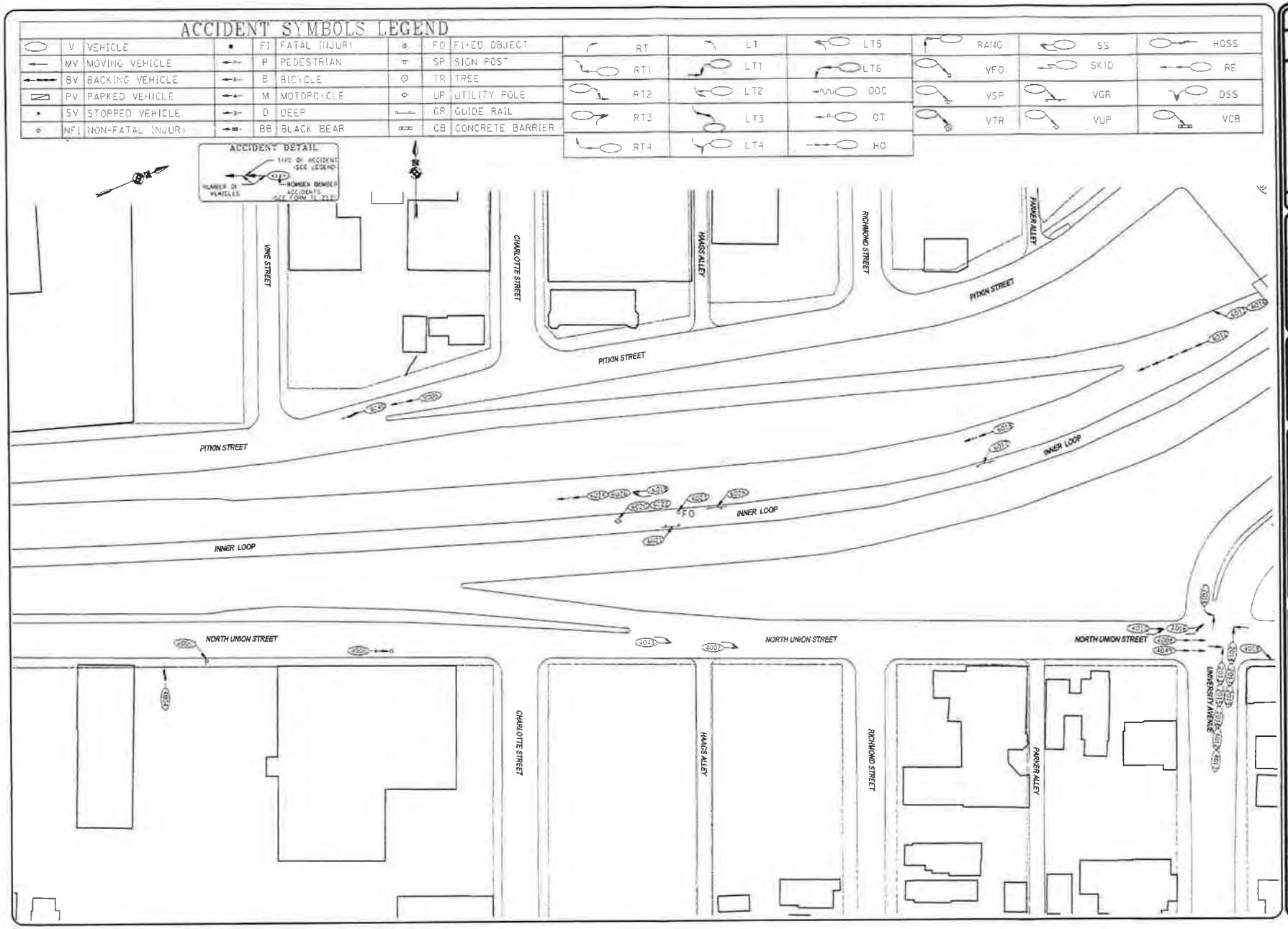
PROJECT NO: 192500170

DRAWING NO: 1

SHEET 1 OF 9

REVISIONS	DATE	BY
1		
2		
3		
4		
5		
6		

PROJECT ENGINEER: K. STEITNER
PROJECT MANAGER: J. HOFMANN
DESIGNED BY:
DRAWN BY:
SCALE:
FIRST PLOT DATE: 7/15/2025



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Fax (585) 475-1691
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PROJECT: INNER LOOP IMPROVEMENT PROJECT SOID STREET TO CLINTON AVENUE
CITY OF ROCHESTER, NEW YORK

TITLE OF DRAWING: ACCIDENT COLLISION DIAGRAM PLAN

PROJECT NO: 192500170

DRAWING NO: 2

SHEET 2 OF 9

DRAWN BY: T. SCHULZE

DATE: 10/31/2008

SCALE: 1"=40'

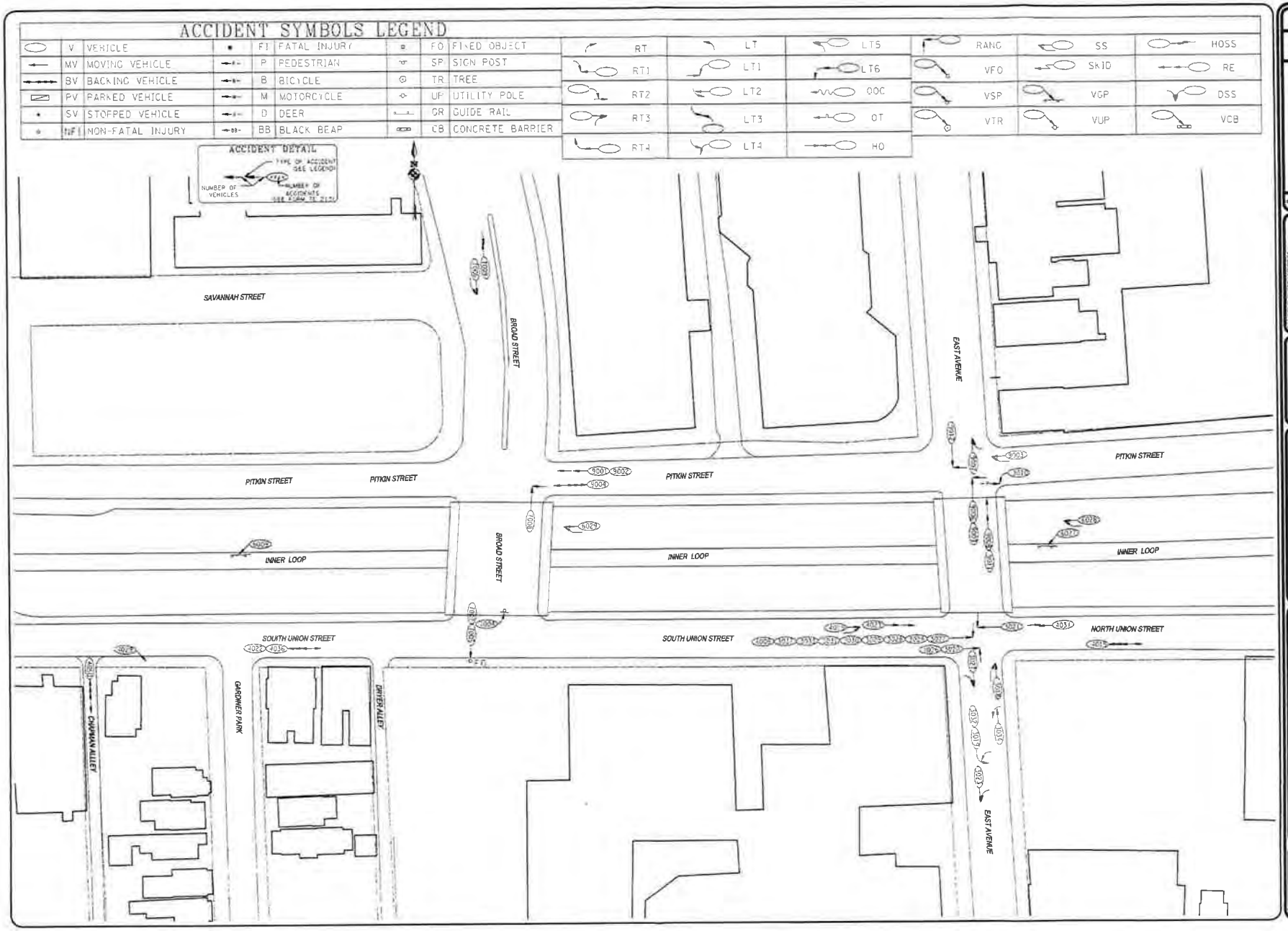
PROJECT ENGINEER: R. SCHLEMMER

PROJECT MANAGER: J. HOFMANN

REVISIONS

NO.	DATE	BY
0		
1		
2		
3		
4		
5		
6		

ANSI D - 22" X 34"



STANTEC CONSULTING SERVICES, INC.
2250 Brighton Henrietta TL RD
Rochester, NY 14623-2708
Tel:(585) 475-1440
Fax:(585) 427-9124
www.stantec.com

PROJECT: INNER LOOP IMPROVEMENT PROJECT SCIO STREET TO CLINTON AVENUE
CITY OF ROCHESTER, NEW YORK

TITLE OF DRAWING: ACCIDENT COLLISION DIAGRAM PLAN

PROJECT NO: 192500170

DRAWING NO: 3

SHEET 3 OF 9

PROJECT ENGINEER/ARCHITECT: K. STEITNER
PROJECT MANAGER: J. HOFMANN
DRAWN BY:
SCALE:
FIRST ISSUE DATE: 7/10/2008

NO	DATE	REVISIONS
6		
5		
4		
3		
2		
1		
0		

Plotting Information
Plot Date: 7/10/2008
Design File: (11180201)
Plotted: 1/23/2009
Time: 2:33:21 PM

Workspace
Project: (Project)
Project/Y_Highway_Design_Engr
Node: FREEMANA-IP2

ANSI D - 22" X 34"

ACCIDENT SYMBOLS LEGEND

V	VEHICLE	F	FATAL INJURY	FO	FIXED OBJECT		
MV	MOVING VEHICLE	P	PEDESTRIAN	SP	SIGN POST		
BV	BACKING VEHICLE	B	BICYCLE	TR	TREE		
PV	PARKED VEHICLE	M	MOTORCYCLE	UP	UTILITY POLE		
SV	STOPPED VEHICLE	D	DEER	GR	GUIDE RAIL		
NF	NON-FATAL INJURY	BB	BLACK BEAR	CB	CONCRETE BARRIER		

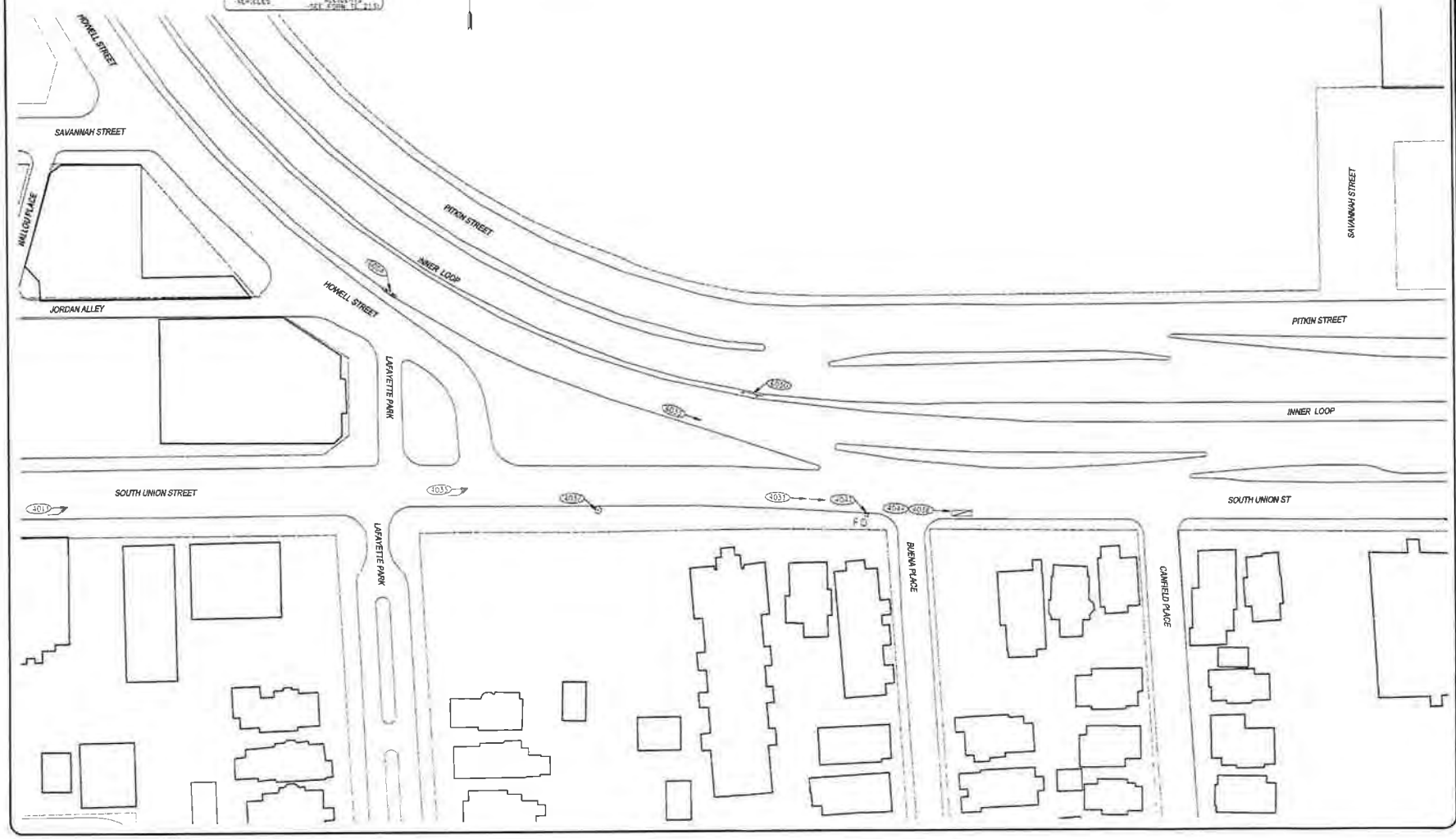
RT	LT	LT5	RANG	SS	HOSS
RT1	LT1	LT6	VFO	SKID	RE
RT2	LT2	OOC	VSP	VGR	DSS
RT3	LT3	OT	VTR	VUP	VCB
RT4	LT4	HO			

ACCIDENT DETAIL

TYPE OF ACCIDENT (SEE LEGEND)

NUMBER OF VEHICLES

NUMBER OF ACCIDENTS (SEE CODE TO 2131)



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PROJECT ENGINEER: K. STETTNER
PROJECT MANAGER: J. HOFMANN

PRELIMINARY 7/18/2008

PROJECT: INNER LOOP IMPROVEMENT PROJECT SCIO STREET TO CLINTON AVENUE
CITY OF ROCHESTER, NEW YORK

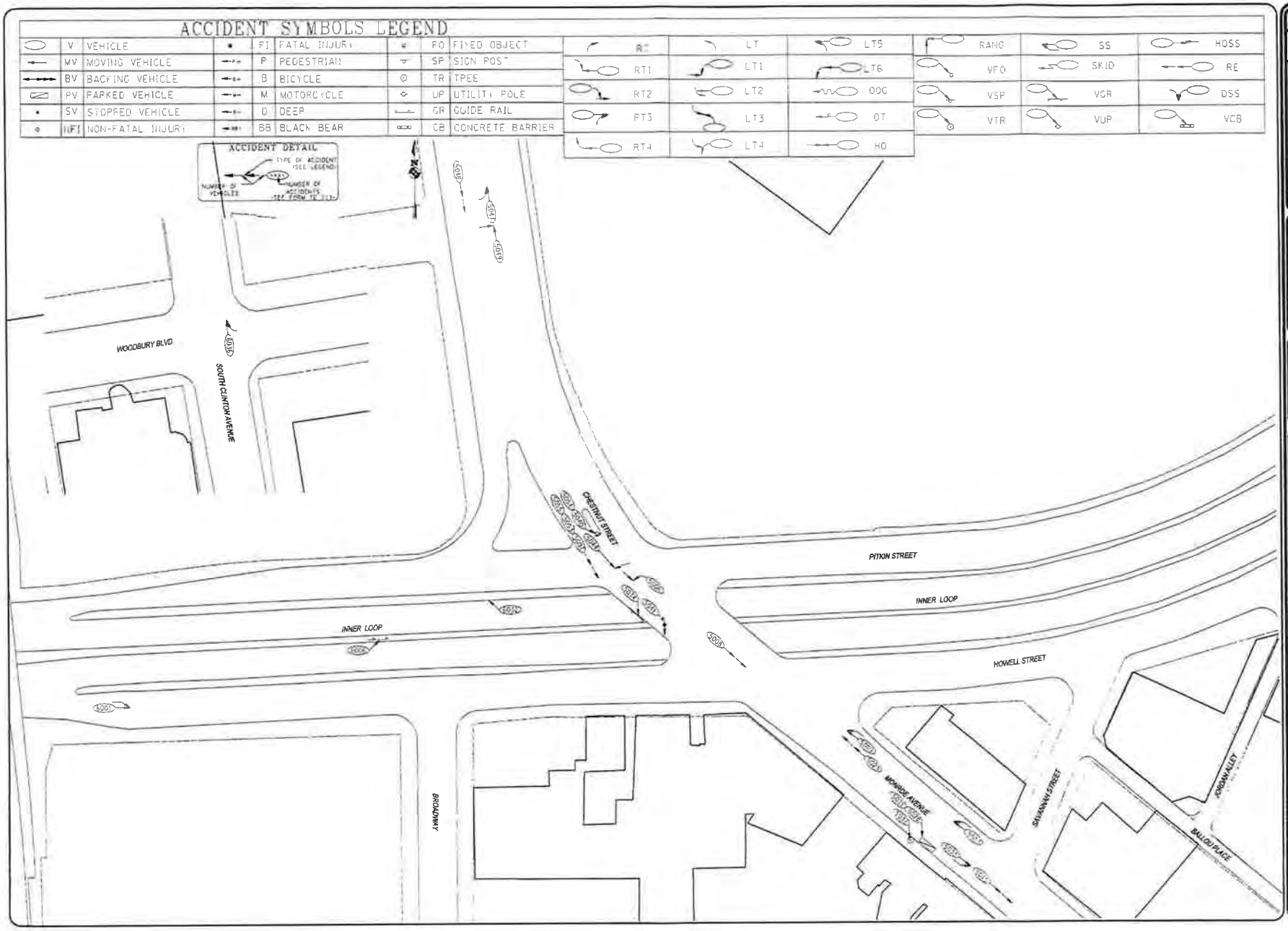
TITLE OF DRAWING: ACCIDENT COLLISION DIAGRAM PLAN

PROJECT NO: 192500170

DRAWING NO: 4

SHEET 4 OF 9

ANSI D - 22" X 34"


ACCIDENT SYMBOLS LEGEND
V VEHICLE
MV MOVING VEHICLE
BV BACKING VEHICLE
PV PARKED VEHICLE
SV STOPPED VEHICLE
NF NON-FATAL INJURY
FI FATAL INJURY
P PEDESTRIAN
B BICYCLE
M MOTORCYCLE
D DEER
BB BLACK BEAR
FO FIXED OBJECT
SP SIGN POST
TR TREE
UP UTILITY POLE
GR GUIDE RAIL
CB CONCRETE BARRIER
RT
RT1
RT2
RT3
RT4
LT
LT1
LT2
LT3
LT4
LT5
LT6
OOC
OT
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RANG
VFO
VSP
VTR
SS
SKID
VGR
VUP
HOSS
RE
DSS
VCB
ACCIDENT DETAIL
TYPE OF ACCIDENT (SEE LEGEND)
NUMBER OF VEHICLES
NUMBER OF ACCIDENTS (SEE FROM TO 3.1.5)
WOODBURY BLVD
SOUTH CLINTON AVENUE
CHESTNUT STREET
PITKIN STREET
INNER LOOP
HOWELL STREET
BROADWAY
MONROE AVENUE
SAVANNAH STREET
JORDAN ALLEY
BALLOU PLACE
STANTEC CONSULTING SERVICES, INC.
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Fax (585) 475-1418
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Stantec
PROJECT
INNER LOOP IMPROVEMENT PROJECT
SCIO STREET TO CLINTON AVENUE
CITY OF ROCHESTER, NEW YORK
TITLE OF DRAWING
ACCIDENT COLLISION DIAGRAM PLAN
PROJECT NO
192500170
DRAWING NO
5
SHEET 5 OF 9
PROJECT ENGINEER/ARCHITECT
K. STEFFINGER
PROJECT MANAGER
J. HOFMANN
DRAWN BY
SCALE
FIRST ISSUE DATE
7/18/2008
REVISIONS
DATE
BY

ANSI D - 22" X 34"

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PROJECT: INNER LOOP IMPROVEMENT PROJECT SCIO STREET TO CLINTON AVENUE
CITY OF ROCHESTER, NEW YORK

TITLE OF DRAWING: ACCIDENT COLLISION DIAGRAM PLAN

PROJECT NO. 192500170

DRAWING NO. 6

SHEET 6 OF 8

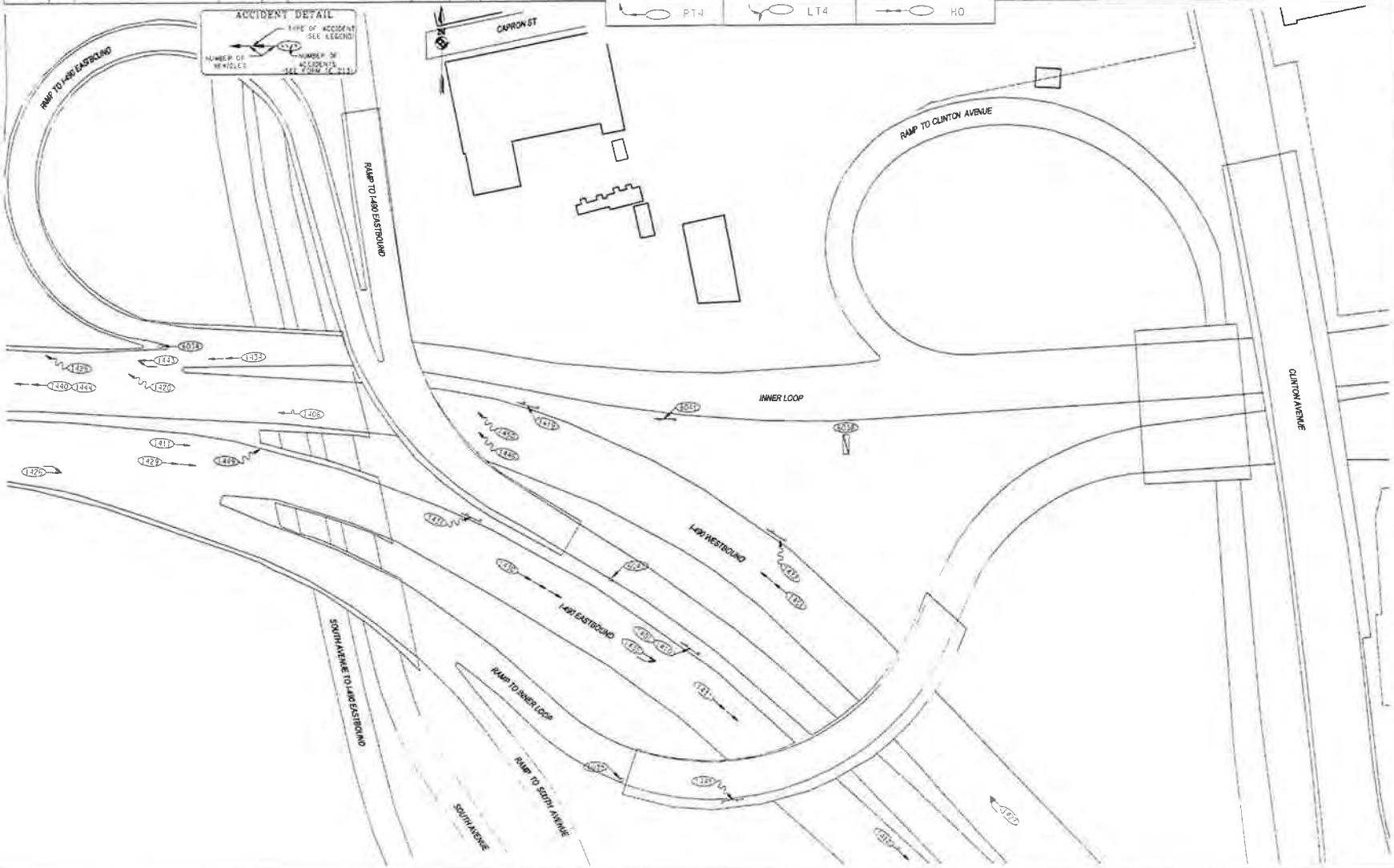
PROJECT ENGINEER/ARCHITECT: K. STEITNER
PROJECT MANAGER: J. HOFMANN
DRAWN BY:
DATE:
FIRST ISSUE DATE: 7/18/2008
REVISIONS
DATE BY

ANSI D - 22" X 34"

ACCIDENT SYMBOLS LEGEND

	V	VEHICLE		FI	FATAL INJURY		FO	FIXED OBJECT
	MV	MOVING VEHICLE		P	PEDESTRIAN		SP	SIGN POST
	BV	BACKING VEHICLE		B	BICYCLE		TR	TREE
	PV	PARKED VEHICLE		M	MOTORCYCLE		UP	UTILITY POLE
	SV	STOPPED VEHICLE		D	DEER		GR	GUIDE RAIL
	NFI	NON-FATAL INJURY		BB	BLACK BEAR		CB	CONCRETE BARRIER

RT	LT	LT5	RANG	SS	HOSS
RT1	LT1	LT6	VFO	SKID	RE
RT2	LT2	OOC	VSP	VGR	DSS
RT3	LT3	OT	VTR	VUP	VCB
RT4	LT4	HO			



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PROJECT: INNER LOOP IMPROVEMENT PROJECT
SCIO STREET TO CLINTON AVENUE
CITY OF ROCHESTER, NEW YORK

TITLE OF DRAWING: ACCIDENT COLLISION DIAGRAM PLAN

PROJECT NO: 192500170

DRAWING NO: 7

SHEET 7 OF 9

PROJECT MANAGER: K. STEITHER
PROJECT ENGINEER: J. HOFMANN
DRAWN BY:
SCALE:
FIRST ISSUED DATE: 7/16/2008

NO	DATE	BY	REVISIONS
6			
5			
4			
3			
2			
1			
0			

ANSI D - 22" X 34"

ACCIDENT SYMBOLS LEGEND

	V	VEHICLE		FI	FATAL INJURY		FO	FIXED OBJECT
	MV	MOVING VEHICLE		P	PEDESTRIAN		SP	SIGN POST
	BV	BACKING VEHICLE		B	BICYCLE		TR	TREE
	PV	PARKED VEHICLE		M	MOTORCYCLE		UP	UTILITY POLE
	SV	STOPPED VEHICLE		D	DEER		GR	GUIDE RAIL
	NFI	NON-FATAL INJURY		BB	BLACK BEAR		CB	CONCRETE BARRIER

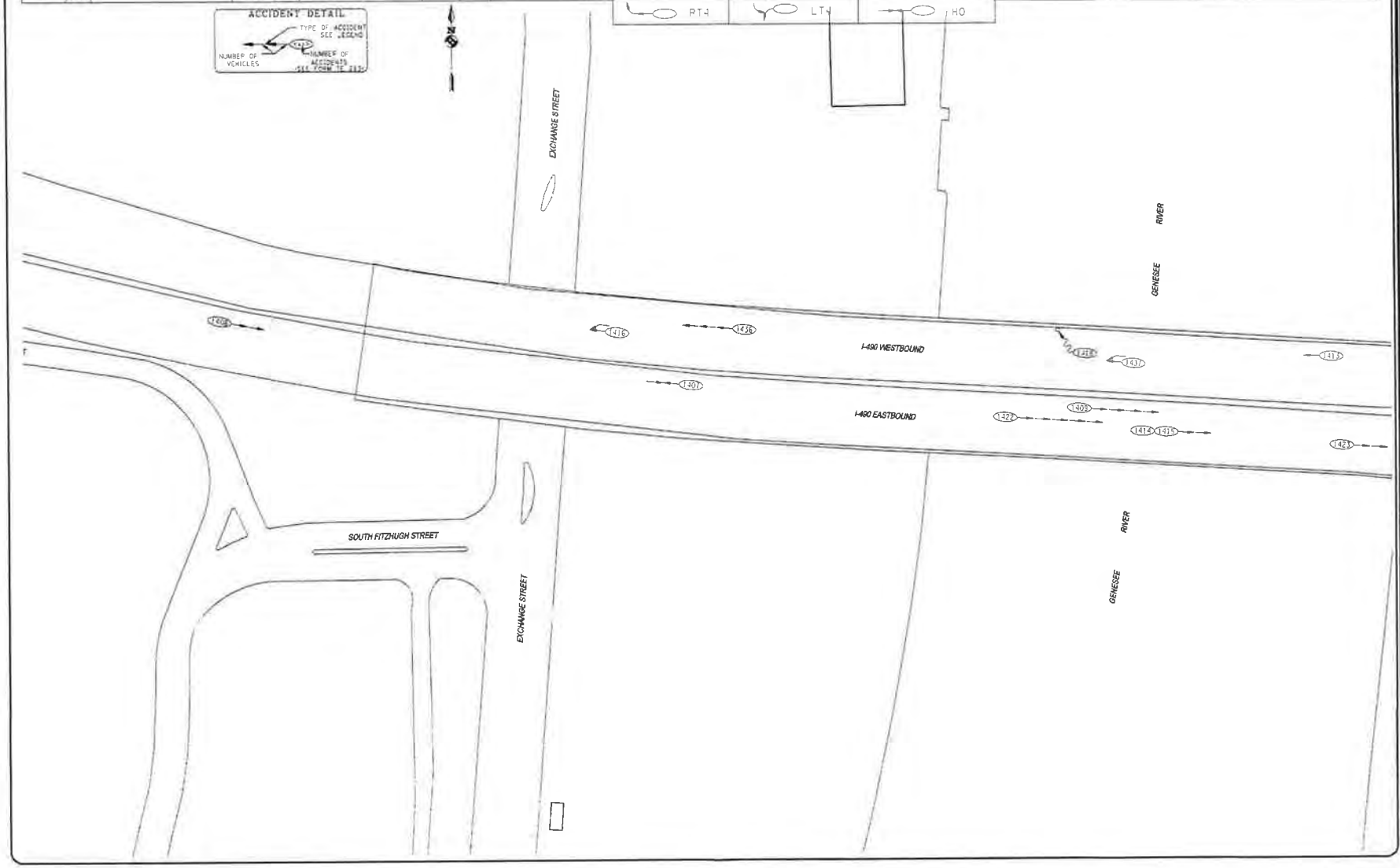
RT	LT	LT5	RANC	SS	HOSS
RT1	LT1	LT6	VFO	SKID	RE
RT2	LT2	OOC	VSP	VGR	DSS
RT3	LT3	OT	VTR	VUP	VCB
RT4	LT4	HO			

ACCIDENT DETAIL

TYPE OF ACCIDENT SEE LEGEND

NUMBER OF VEHICLES

NUMBER OF ACCIDENTS (SEE FORM TE 232)



6			
5			
4			
3			
2			
1			
0	REVISIONS	DATE	BY

PROJECT DESIGNER/PROPERTIES
K. STETTNER
PROJECT MANAGER
J. HOFMANN

DRAWN BY

SCALE

FIRST ISSUED DATE
7/18/2008

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Stantec

PROJECT
INNER LOOP IMPROVEMENT PROJECT
SCIO STREET TO CLINTON AVENUE
CITY OF ROCHESTER, NEW YORK

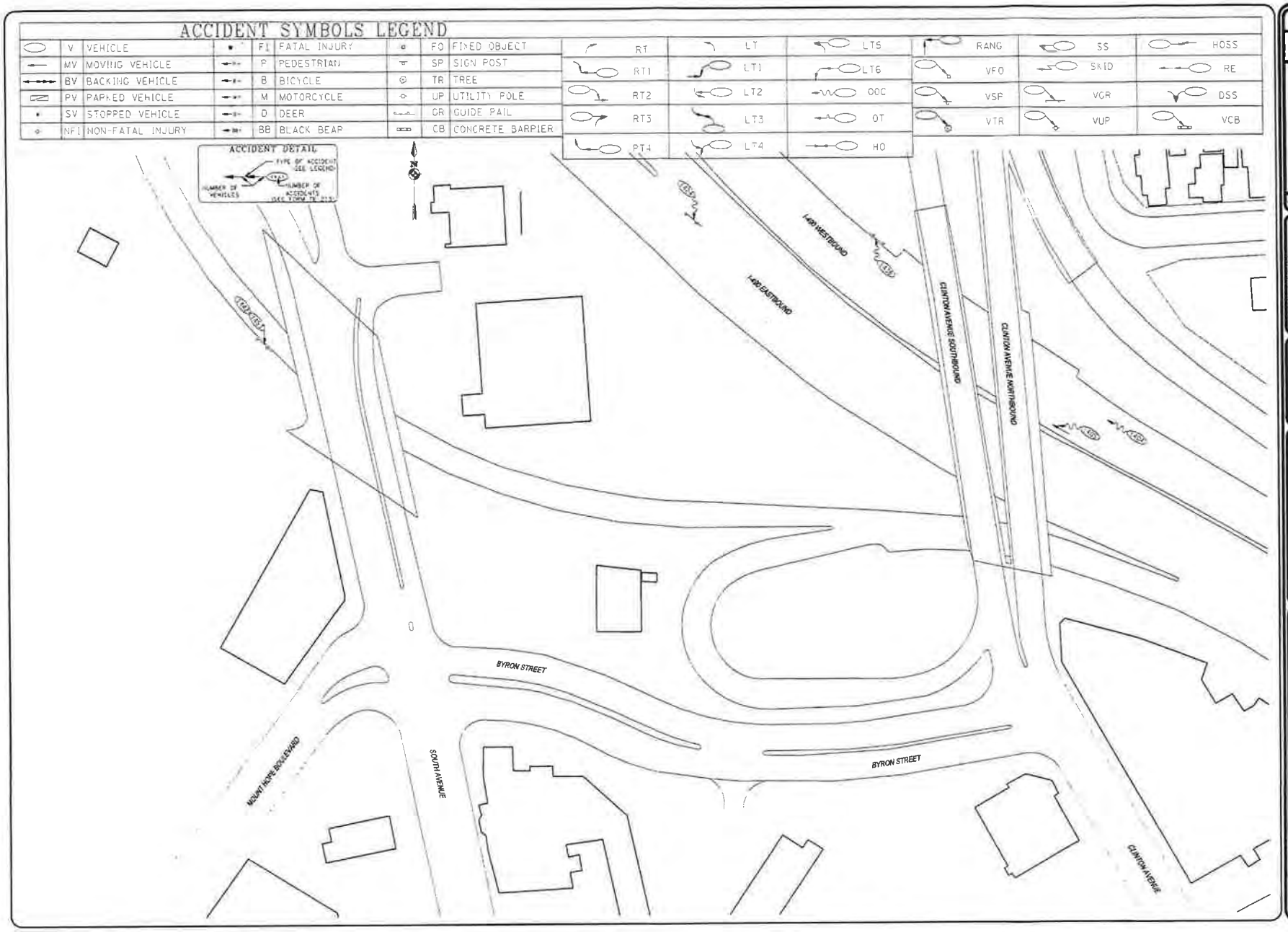
TITLE OF DRAWING
ACCIDENT COLLISION DIAGRAM PLAN

PROJECT NO.
192500170

DRAWING NO.
8

SHEET 8 OF 9

ANSI D - 22" X 34"



NO.	REVISIONS	DATE	BY
6			
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PROJECT MANAGER/ARCHITECT: K. STETTNER
PROJECT ENGINEER: J. HOFMANN
DRAWN BY:
SCALE:
PRELIMINARY DATE: 7/10/2008

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PROJECT: INNER LOOP IMPROVEMENT PROJECT SOIO STREET TO CLINTON AVENUE
CITY OF ROCHESTER, NEW YORK

TITLE OF DRAWING: ACCIDENT COLLISION DIAGRAM PLAN

PROJECT NO: 192500170
DRAWING NO: 9
SHEET 9 OF 9

ANSI D - 22" X 34"

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: Inner Loop

County of Monroe

Town of City of Rochester

Street Name: Inner Loop (Rt. 940T)

Route Number:

Location: Inner Loop

Milepost: E. Main St To: I-490

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 1

PERIOD STUDIED

From 1/1/2005

To: 3/7/2008

39 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
6001	6/5/2006	16:15		PDO	1	2	1	1	7,13	Side	V2 STRUCK V1 AT EXIT LANE FOR MONROE AVE. (7) Failure to Yield Right of Way (13) Passing or Lane Usage Improper
6004	12/16/2007	5:43		Inj	4	4	2	1	2,19	FixO	V1 STRUCK GUIDE RAIL,THEN STRUCK GUIDE RAIL WITH LEFT SIDE (2) Alcohol Involvement (19) Unsafe Speed
6005	2/9/2007	0:29		Inj	4	4	4	4	2,66	FixO	V1 SPUN OUT OF CONTROL, HITTING WALL & FLIPPING ONTO IT'S ROOF. (2) Alcohol Involvement (66) Pavement Slippery
6006	3/7/2008	21:30		Inj	4	6	4	4	66	FixO	V1 HIT ICY PATCH ON THE ROAD , SPUN OUT & HIT GUARD RAIL. (66) Pavement Slippery
6009	7/5/2007	1:00		PDO	4	1	1	1	2,13	FixO	V1 LEFT IT'S LANE & STRUCK GUARD RAIL (2) Alcohol Involvement (13) Passing or Lane Usage Improper
6011	6/10/2005	16:05		PDO	1	2	1	1	13	Side	V1 PASS V2, LOST CONTROL STRIKING V2 (13) Passing or Lane Usage Improper
6012	2/8/2006	16:16		Inj	1	1	1	2	9	REnd	Acc. Main St to Acc. E. Ave (9) Following Too Closely
6013	11/16/2006	18:29		PDO	4	5	2	3	66	FixO	Acc. Main St to Acc. E. Ave (66) Pavement Slippery
6016	6/2/2007	12:05		Inj	1	1	1	1	4	RAng	rmp from Main St (4) Driver Inattention
6017	9/22/2006	7:49		PDO	1	5	1	1	19,13	FixO	Acc. Main St to Acc. E. Ave (19) Unsafe Speed (13) Passing or Lane Usage Improper
6018	4/8/2007	14:23		Inj	1	5	1	1	9	REnd	Acc. Main St to Acc. E. Ave (9) Following Too Closely
6019	4/4/2005	22:40		Inj	4	1	1	2	20,19	Side	Acc. Main St to Acc. E. Ave (20) Unsafe Lane Changing (19) Unsafe Speed
6020	10/19/2006	19:00		Inj	4	4	2	3	19,66	FixO	Acc. Main St to Acc. E. Ave (19) Unsafe Speed (66) Pavement Slippery
6021	1/24/2007	1:40		Inj	4	5	2	2	13	FixO	Acc. Main St to Acc. E. Ave (13) Passing or Lane Usage Improper

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: Inner Loop

County of Monroe

Town of City of Rochester

Street Name: Inner Loop (Rt. 940T)

Route Number:

Location: Inner Loop

Milepost: E. Main St To: I-490

Date of Report: 1/13/200

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Page Number 2

PERIOD STUDIED

From 1/1/2005

To: 3/7/2008

39 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
6022	1/26/2007	23:35		PDO	4	5	4	2	19,66	FixO	Acc. Main St to Acc. E. Ave (19) Unsafe Speed (66) Pavement Slippery
6023	2/15/2007	8:02		PDO	1	5	4	1	19,66	FixO	Acc. Main St to Acc. E. Ave (19) Unsafe Speed (66) Pavement Slippery
6024	2/15/2007	9:45		Inj	1	1	4	1	19,66	REnd	Acc. Main St to Acc. E. Ave (19) Unsafe Speed (66) Pavement Slippery
6025	7/5/2007	0:10		PDO	4	1	1	1	2,13	FixO	Acc. Main St to Acc. E. Ave (2) Alcohol Involvement (13) Passing or Lane Usage Improper
6026	10/19/2006	18:22		PDO	4	1	2	3	19,64	REnd	Main St Ramp (19) Unsafe Speed (64) Obstruction/Debris
6027	1/20/2005	8:04		PDO	1	1	4	4	19,66	FixO	Access E. Ave to Ramp Chapman St. (19) Unsafe Speed (66) Pavement Slippery
6028	2/16/2007	4:30		PDO	4	1	4	4	66	Side	Access E. Ave to Ramp Chapman St. (66) Pavement Slippery
6029	6/10/2005	16:05		PDO	1	1	1	1	13	Side	Access Ramp Chapman St to Access Buena St (13) Passing or Lane Usage Improper
6030	1/1/2005	4:24		Inj	4	1	1	2	2	FixO	Slip Ramp from Pitkin (2) Alcohol Involvement
6032	5/26/2007	11:25		PDO	1	6	1	1	19,47	FixO	Ramp Chapman St to Access Buena St (19) Unsafe Speed (47) Tire Failure/Inadequate
6033	12/20/2006	6:45		PDO	2	1	1	1	64	Unkn	Ramp to Buena St - V1 hit debris in the road (64) Obstruction/Debris
6034	7/27/2007	11:17		PDO	4	5	1	1	2,20	FixO	I-490East Ramp-crashed into attenuator at diverge pt. (2) Alcohol Involvement (20) Unsafe Lane Changing
6038	9/13/2006	22:45	1	PDO	4	1		2	60	Unkn	I-490East Ramp - truck on fire in construction zone (60) Other Vehicular
6039	5/26/2007	11:25	1	PDO	1	6	1	1	19,47	FixO	South overpass - going straight, hit curb, unsafe speed (19) Unsafe Speed (47) Tire Failure/Inadequate

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: Inner Loop

County of Monroe

Town of City of Rochester

Street Name: Inner Loop (Rt. 940T)

Route Number:

Location: Inner Loop

Milepost: E. Main St To: I-490

Date of Report: 1/13/200

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Page Number 3

PERIOD STUDIED

From 1/1/2005

To: 3/7/2008

39 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
6040	1/5/2008	2:18	2	Inj	4	1	1	2	17,20	H-On	E. Clinton Overpass- wrong way on Inner loop (17) Traffic Control Disregarded (20) Unsafe Lane Changing
6041	1/11/2008	6:31	1	Inj	2	4	2	3	19,66	FixO	W of Clinton overpass - unsafe speed, pavement slippery (19) Unsafe Speed (66) Pavement Slippery

Location: Inner Loop

Town: City of Rochester

13-Jan-09

County: Monroe

Milepost: E. Main St To: I-490

Time of Day	No. of Accidents	% of Total
6 AM - 10 AM	6	20
10:00 AM - 4 PM	5	17
4 PM - 7 PM	6	20
7 PM - 12 MID	5	17
12 MID - 6 AM	8	27
Unspecified	0	0
Total	30	

Direction	# Veh	% of Total
North:	0	0
South:	1	2.3
East:	8	19
West:	30	70
Unknown:	0	0

Direction	# Veh	% of Total
NorthEast:	0	0
NorthWest:	1	2.3
SouthEast:	3	7
SouthWest:	0	0
Total	43	

Weather	No. of Accidents	
Clear:	15	50
Cloudy:	7	23
Fog:	0	0
Rain:	4	13
Sleet:	0	0
Snow:	4	13
Unknown:	0	0
Total	30	

Acc. Type	# Veh	% of Total
Sideswipe:	5	17
Rear End:	4	13
Right Angle:	1	3.3
Left Turn:	0	0
Pedestrian:	0	0
Fixed Object:	17	57
Head on:	1	3.3

Acc. Type	# Veh	% of Total
Bicycle:	0	0
Right Turn:	0	0
Driveway:	0	0
Backing:	0	0
Overtaking:	0	0
Unknown:	2	6.7
Total	30	

Pavement	No. of Accidents	
Dry:	16	55
Muddy:	0	0
Other:	0	0
Slush:	0	0
Snow/Ice:	7	24
Wet:	6	21
Unknown:	0	0
Total	29	

Accident Severity	No. of Accidents	% of Total
Fatal:	0	0
Non-Fatal Injury:	13	43
Property damage only:	17	57
Non-reportable:	0	0
Total	30	

Type of Vehicle	No. of Accidents	% of Total
Passenger Cars:	43	98
Commercial Vehicles:	1	2.3
Total	44	

Time of Year	No. of Accidents	
Winter (Dec-Feb)	13	43
Spring (Mar-May)	5	17
Summer (Jun-Aug)	7	23
Fall (Sep-Nov)	5	17
Total	30	

Light Condition	No. of Accidents	% of Total
Dark Road-Lighted:	16	53
Dark Road-Unlighted:	0	0
Dawn:	2	6.7
Daylight:	12	40
Dusk:	0	0
Unknown:	0	0
Total	30	

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: East Main

County of Monroe

Town of City of Rochester

Street Name: East Main St Corridor

Route Number:

Location: East Main St

Milepost: University Ave To: Union Street

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 1

PERIOD STUDIED

From 1/1/2005

To: 5/10/200

41 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
1019	10/2/2005	11:50	2	PDO	1	1	1	1	4,9	REnd	V1 rear-ended v2 while V2 was stopped in traffic. (4) Driver Inattention (9) Following Too Closely
1021	9/19/2006	12:03	2	PDO	1	1	1	1	18,20	Side	Vehicles turning left in adjoining lanes when v1 veered into v2. (18) Turning Improperly (20) Unsafe Lane Changing
1023	5/23/2007	13:40	2	PDO	1	1	1	1	4	Side	V1 sideswiped the parked v2. (4) Driver Inattention
1033	1/3/2006	16:20	2	PDO	1	1	1	2	69,7	RAng	V1 was allowed to enter by v2 stopped vehicles in Lanes 1 & 2 but entering lane 3 struck V2 (69) View Obstructed/Limited (7) Failure to Yield Right of Way
1034	9/9/2005	13:38	2	PDO	1	1	1	1	9	REnd	(9) Following Too Closely
1035	3/28/2006	9:10	2	Inj	1	2	1	1		Left	V2 in intersection when light turned red. V1 started before V2 cleared
1037	3/2/2007	22:50	2	PDO	4	1	1	1	, 18	Left	V2 turned into the path of V1 (18) Turning Improperly
1038	6/2/2007	12:05	2	Inj	1	1	1	1	4	RAng	V1 struck v2. (4) Driver Inattention
1039	4/4/2007	8:06	2	PDO	1	1	2	3	, 18,13	Side	V2 was sideswiped by v1. (18) Turning Improperly (13) Passing or Lane Usage Improper
1040	3/6/2007	22:11	2	PDO	4	1	4	2	, 7	Left	(7) Failure to Yield Right of Way
1041	3/26/2006	13:35	2	PDO	1	1	1	2	17	RAng	(17) Traffic Control Disregarded
1042	6/10/2005	13:33	2	PDO	1	1	2	2	4,20	Side	V1 clipped mirror on V2 while goig around a third unvolved vehicle. (4) Driver Inattention (20) Unsafe Lane Changing
1043	7/6/2005	1:16	2	PDO	1	1	2	3	7,17	RAng	V1 ran red light and struck V2 (7) Failure to Yield Right of Way (17) Traffic Control Disregarded
1044	9/17/2005	15:29	2	PDO	1	1	1	1	, 17	RAng	V1 struck V2 who had failed to stop for the red light. (17) Traffic Control Disregarded

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: East Main

County of Monroe

Town of City of Rochester

Street Name: East Main St Corridor

Route Number:

Location: East Main St

Milepost: University Ave To: Union Street

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

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By _____

Page Number 2

PERIOD STUDIED

From 1/1/2005

To: 5/10/200

41 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
1045	9/26/2005	21:52	2	PDO	4	4	1	1	4	Over	(4) Driver Inattention
1046	10/22/2005	20:06	2	Inj	4	1	2	3	, 17	RAng	V2 ran a red light and was struck by V1 (17) Traffic Control Disregarded
1047	10/25/2005	7:35	2	Inj	1	1	2	3	17	RAng	V1 & 2 colided in the intersection and claim both had a green light. (17) Traffic Control Disregarded
1048	12/7/2005	7:45	2	PDO	1	1	2	2	, 26	REnd	V2 stopped quickly to avoid vehicle running a red light and was rearended by V2 (26) Reaction to Other Univolved Vehicle
1049	12/27/2005	17:12	2	PDO	4	1	1	2	3	Back	V1 backed into V2 (3) Backing Unsafely
1050	3/27/2006	13:50	2	PDO	1	1	1	1	4	REnd	(4) Driver Inattention
1051	5/19/2006		3	PDO	1	1	2	3	17	RAng	V1 ran the red light and was struck by v2 and V3. (17) Traffic Control Disregarded
1052	8/12/2006	9:05		PDO	1	1	1	1	4	REnd	(4) Driver Inattention
1054	11/2/2006	12:33	2	Inj	1	1	1	1	17, 17,7	RAng	V1&2 struck each other. Both drivers claimed that they had a green light. (17) Traffic Control Disregarded (17) Traffic Control Disregarded (7) Failure to Yield Right of Way
1055	1/2/2007	16:06	2	PDO	3	4	1	1	18	Side	V1 straight in a left turnlane and struck v2, in a left turnlane (18) Turning Improperly
1056	5/3/2007	23:35	2	PDO	4	1	1	2	2,20	Side	V1 sideswiped V2 and left the scene (2) Alcohol Involvement (20) Unsafe Lane Changing
1057	5/29/2007	18:15	2	PDO	1	1	1		4	REnd	(4) Driver Inattention
1058	6/28/2007	17:15	2	PDO	1	1	1	1	4	REnd	(4) Driver Inattention
1059	7/27/2007	17:16	2	PDO	1	1	1	1	13	Side	Both vehicles were turning left and V2 drifted into v1's lane. (13) Passing or Lane Usage Improper

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: East Main

County of Monroe

Town of City of Rochester

Street Name: East Main St Corridor

Route Number:

Location: East Main St

Milepost: University Ave To: Union Street

Date of Report: 1/13/200

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Page Number 3

PERIOD STUDIED

From 1/1/2005

To: 5/10/200

41 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
1060	8/29/2007	13:59	2	PDO	1	4	1	1	7,20	Over	V1 U-turn from the right lane and turned infront of V2 (7) Failure to Yield Right of Way (20) Unsafe Lane Changing
1061	4/22/2008	9:00	2	PDO	1	1	1	1	13	Side	V1 struck V2 with its trailer while they were both turning left (13) Passing or Lane Usage Improper
1062	5/6/2008	16:02	2	PDO	1	1	1	2	13	Over	(13) Passing or Lane Usage Improper
1063	5/10/2008	13:34	3	PDO	1	1	1	1	17,4	RAng	V1 tried to make the light and Struck V2&3 (17) Traffic Control Disregarded (4) Driver Inattention
1068	9/8/2006	22:40	2	PDO	4	1	1	2	13	Over	V1 merge to right lane and struck v2 (13) Passing or Lane Usage Improper
1071	7/2/2007	10:32	2	PDO	1	1	1	1	9	REnd	(9) Following Too Closely
1072	7/2/2007	10:32	2	PDO	1	1	1	2	9	REnd	(9) Following Too Closely
1074	11/20/2007	16:30	3	PDO	1	1	1	1	9	REnd	V3 sudden stop causing V2 to stop. V1 hit v2 which caused V2 ot hit V3 (9) Following Too Closely
1075	12/11/2007	13:00	2	PDO	1	1	2	3	9	REnd	(9) Following Too Closely
1076	1/11/2008	10:02	2	PDO	1	1	2	2	26	Side	V1 avoiding another vehicle struck v2 who was the right lane. (26) Reaction to Other Univolved Vehicle
1077	1/21/2008	19:05	2	PDO	4	1	1	2	13	Over	V1 drove by V2 and struck V1's mirror. (13) Passing or Lane Usage Improper
1078	2/9/2008	13:35	2	PDO	1	1	4	2	4,9	REnd	V2 stopped suddenly to let a NYS Trooper by and v1 struck V2 (4) Driver Inattention (9) Following Too Closely
1079	3/7/2008	8:30	3	Inj	1	1	2	2	69, 7,69	Left	V1 struck V2 as it made a left turn causing it to spin out and hit a parked car (69) View Obstructed/Limited (7) Failure to Yield Right of Way (69) View Obstructed/Limited
1081	7/12/2005	8:10	2	PDO	1	1	1	1	7	Left	(7) Failure to Yield Right of Way

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: East Main

County of Monroe

Town of City of Rochester

Street Name: East Main St Corridor

Route Number:

Location: East Main St

Milepost: University Ave To: Union Street

Date of Report: 1/13/200

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Case No. _____

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Page Number 4

PERIOD STUDIED

From 1/1/2005

To: 5/10/200

41 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
1082	9/1/2005	16:06	2	PDO	1	1	1	1	45	Unkn	V1's mirror struck V2 (45) Oversized Vehicle
1084	2/1/2006	14:56	2	PDO	1	1	2	2		REnd	V2 stopped and V1 tried to go around it but clipped the back of V2
1091	8/29/2007	19:27	1	PDO	1	1	1	1		FixO	V1 swerved into pole
1093	2/2/2006	1:09	1	PDO	4	1	1	1	2	FixO	(2) Alcohol Involvement
1094	1/17/2007		2	PDO	0	1	1	1		REnd	E. Main St. @ Union St
1095	4/14/2006	21:14	2	Inj	4	1	1	1		Unkn	E. Main St. @ Union St.
1097	1/1/2005	18:32	2	Inj	4	1	1	1	2	RAng	E. Main St. @ Pitkin St (2) Alcohol Involvement
1099	10/25/2005	7:35	2	Inj	1	1	2	3	17,17	RAng	E. Main St. @ Pitkin St (17) Traffic Control Disregarded (17) Traffic Control Disregarded
1100	5/3/2007	23:50		PDO	4	2	1	1	2,9	REnd	V2 stopped at red light, v1 RE v2, then backed up and sideswiped v2 as it passed it (2) Alcohol Involvement (9) Following Too Closely
1101	2/9/2007	13:45		Inj	1	2	2	2	9	REnd	V2 stopped at light, V1 RE V2 following too closely (9) Following Too Closely
1102	2/27/2007	9:20		PDO	1	2	1	1	4	REnd	V2 stopped, V1 lost control, spun around RE v2 (4) Driver Inattention
1103	2/27/2008	9:00		PDO	1	2	4	2	19,66	REnd	V2 stopped, V1 RE V2, unsafe speed, pavement slippery (19) Unsafe Speed (66) Pavement Slippery
1104											Add Accidents under: University Ave + Union St Corridors

Location: East Main St

Town: City of Rochester

12-Jan-09

County: Monroe

Milepost: University Ave **To:** Union Street

Time of Day	No. of Accidents	% of Total
6 AM - 10 AM	11	21
10:00 AM - 4 PM	19	37
4 PM - 7 PM	10	19
7 PM - 12 MID	10	19
12 MID - 6 AM	2	3.8
Unspecified	0	0
Total	52	

Direction	# Veh	% of Total
North:	10	9.3
South:	19	18
East:	21	20
West:	49	46
Unknown:	0	0

Direction	# Veh	% of Total
NorthEast:	1	0.9
NorthWest:	1	0.9
SouthEast:	5	4.7
SouthWest:	1	0.9
Total	107	

Weather	No. of Accidents	
Clear:	29	55
Cloudy:	17	32
Fog:	0	0
Rain:	7	13
Sleet:	0	0
Snow:	0	0
Unknown:	0	0
Total	53	

Acc. Type	# Veh	% of Total
Sideswipe:	9	17
Rear End:	18	33
Right Angle:	12	22
Left Turn:	5	9.3
Pedestrian:	0	0
Fixed Object:	2	3.7
Head on:	0	0

Acc. Type	# Veh	% of Total
Bicycle:	0	0
Right Turn:	0	0
Driveway:	0	0
Backing:	1	1.9
Overtaking:	5	9.3
Unknown:	2	3.7
Total	54	

Pavement	No. of Accidents	
Dry:	38	70
Muddy:	0	0
Other:	0	0
Slush:	0	0
Snow/Ice:	3	5.6
Wet:	13	24
Unknown:	0	0
Total	54	

Accident Severity	No. of Accidents	% of Total
Fatal:	0	0
Non-Fatal Injury:	10	19
Property damage only:	44	81
Non-reportable:	0	0
Total	54	

Type of Vehicle	No. of Accidents	% of Total
Passenger Cars:	108	100
Commercial Vehicles:	0	0
Total	108	

Time of Year	No. of Accidents	
Winter (Dec-Feb)	15	28
Spring (Mar-May)	16	30
Summer (Jun-Aug)	11	20
Fall (Sep-Nov)	12	22
Total	54	

Light Condition	No. of Accidents	% of Total
Dark Road-Lighted:	12	22
Dark Road-Unlighted:	0	0
Dawn:	0	0
Daylight:	40	74
Dusk:	1	1.9
Unknown:	1	1.9
Total	54	

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: University

County of Monroe

Town of City of Rochester

Street Name: University Ave Corridor

Route Number:

Location: University Ave

Milepost: E. Main St To: Union St

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 1

PERIOD STUDIED

From 4/2/2005

To: 4/9/2008

37 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
2002	7/19/2005	13:15		PDO	1	1	1	2	4,20	Side	V1 changed lanes and struck V2 (4) Driver Inattention (20) Unsafe Lane Changing
2003	8/15/2005	12:39		PDO	1	1	1	1	17	REnd	V1 struck V2 after V2 stopped for an emergency vehicle. (17) Traffic Control Disregarded
2004	1/5/2006	13:40		PDO	1	4	2	2	20,13	Over	(20) Unsafe Lane Changing (13) Passing or Lane Usage Improper
2005	1/18/2006	7:57		PDO	1	1	2	2	4	REnd	V1 was cut off and stopped when struck by V2 (4) Driver Inattention
2006	6/21/2006	21:12		PDO	4	1	1	1	7	Over	V1 merged over and struck V2. (7) Failure to Yield Right of Way
2007	7/20/2006	8:49		PDO	1	1	1	1	9	REnd	V2 stopped for pedestrians and V1 rear-ended V 2. (9) Following Too Closely
2008	8/23/2006	14:40		PDO	1	1	1	2	4	Bike	V2 was struck by Bicycle as v2 was turning left (4) Driver Inattention
2009	12/29/2006	23:55		PDO	4	1	1	2	9	REnd	(9) Following Too Closely
2010	2/6/2007	16:13		PDO	1	1	1	2	, 9	REnd	V1 stopped abruptly and V2 rearended it, and V3 rear ended Vehicle 2. (9) Following Too Closely
2011	3/24/2007	18:49		Inj	1	1	2	3	9,4	REnd	(9) Following Too Closely (4) Driver Inattention
2012	4/7/2007	22:20		PDO	4	4	2	4	18,4	Over	V1 in the left lane andwent straight, v2 turned left from middle lane. V1 hit V2 on the left side. (18) Turning Improperly (4) Driver Inattention
2013	7/9/2006	12:01		PDO	1	1	1	1	, 17	RAng	(17) Traffic Control Disregarded
2014	1/13/2007	10:13		Inj	1	1	2	3	4,17	RAng	(4) Driver Inattention (17) Traffic Control Disregarded
2015	3/3/2007	8:20		PDO	1	1	1	1	, 17	RAng	V2 ran red light and struck V1 (17) Traffic Control Disregarded

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: University

County of Monroe

Town of City of Rochester

Street Name: University Ave Corridor

Route Number:

Location: University Ave

Milepost: E. Main St To: Union St

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 2

PERIOD STUDIED

From 4/2/2005

To: 4/9/2008

37 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
2016	10/4/2007	14:48		PDO	1	1	1	1	, 7	Left	(7) Failure to Yield Right of Way
2017	11/3/2007	14:25		Inj	1	1	1	1	, 20,7	RAng	(20) Unsafe Lane Changing (7) Failure to Yield Right of Way
2018	12/18/2007	21:47		PDO	4	1	4	1		RAng	
2019	4/9/2008	17:28		PDO	1	1	1	1	7	RAng	(7) Failure to Yield Right of Way
2020	4/2/2005	22:40		Inj	4	1	1	1		Left	16648 rmp W. Main St. to NY940T E. Main St
2021	4/4/2007	8:00		PDO	1	1	2	3		Over	16648 rmp W. Main St. to NY940T E. Main St
2022											Add Accidents under: E. Main Street + Union St. Corridors

Location: University Ave

Town: City of Rochester

13-Jan-09

County: Monroe

Milepost: E. Main St

To: Union St

Time of Day	No. of Accidents	% of Total
6 AM - 10 AM	4	20
10:00 AM - 4 PM	8	40
4 PM - 7 PM	3	15
7 PM - 12 MID	5	25
12 MID - 6 AM	0	0
Unspecified	0	0
Total	20	

Direction	# Veh	% of Total
North:	25	63
South:	3	7.5
East:	0	0
West:	9	23
Unknown:	0	0

Direction	# Veh	% of Total
NorthEast:	1	2.5
NorthWest:	1	2.5
SouthEast:	1	2.5
SouthWest:	0	0
Total	40	

Weather	No. of Accidents	
Clear:	10	50
Cloudy:	6	30
Fog:	0	0
Rain:	3	15
Sleet:	0	0
Snow:	1	5
Unknown:	0	0
Total	20	

Acc. Type	# Veh	% of Total
Sideswipe;	1	5
Rear End:	6	30
Right Angle:	6	30
Left Turn;	2	10
Pedestrian:	0	0
Fixed Object:	0	0
Head on:	0	0

Acc. Type	# Veh	% of Total
Bicycle:	1	5
Right Turn:	0	0
Driveway:	0	0
Backing:	0	0
Overtaking:	4	20
Unknown:	0	0
Total	20	

Pavement	No. of Accidents	
Dry:	13	65
Muddy:	0	0
Other:	0	0
Slush:	0	0
Snow/Ice:	1	5
Wet:	6	30
Unknown:	0	0
Total	20	

Accident Severity	No. of Accidents	% of Total
Fatal:	0	0
Non-Fatal Injury:	4	20
Property damage only:	16	80
Non-reportable:	0	0
Total	20	

Type of Vehicle	No. of Accidents	% of Total
Passenger Cars:	41	
Commercial Vehicles:		
Total		

Time of Year	No. of Accidents	
Winter (Dec-Feb)	6	30
Spring (Mar-May)	6	30
Summer (Jun-Aug)	6	30
Fall (Sep-Nov)	2	10
Total	20	

Light Condition	No. of Accidents	% of Total
Dark Road-Lighted:	5	25
Dark Road-Unlighted:	0	0
Dawn:	0	0
Daylight:	15	75
Dusk:	0	0
Unknown:	0	0
Total	20	

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: East Ave/U

County of Monroe

Town of City of Rochester

Street Name: East Ave Corridor

Route Number:

Location: East Ave/Union St

Milepost: To: Union St.

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 1

PERIOD STUDIED

From 9/13/200

To: 4/2/2008

32 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
3011	8/5/2006	2:38		PDO	4	1	1	1	17	Left	(17) Traffic Control Disregarded
3012	7/21/2006	20:01	2	Inj	1	1	1	1		REnd	V1 stopped abruptly rear ended by V2.
3018	9/13/2005	8:06		PDO	1	1	1	1	4,18	Rght	V1 was turning right and turned into V2 (4) Driver Inattention (18) Turning Improperly
3019	9/15/2005	18:03		PDO	1	1	1	1	7,4	Unkn	V3 stopped to let V 1 into traffic, V2 struck V1 making a left (7) Failure to Yield Right of Way (4) Driver Inattention
3020	9/16/2005	22:10		PDO	4	1	1	1		RAng	
3021	10/2/2005	4:00		PDO	4	1	1	1	4	RAng	V1 went the wrong way on N. Union, entered intersection and struck V2 (4) Driver Inattention
3022	1/6/2006	22:45		PDO	4	1	4	4		RAng	
3023	6/3/2006	20:59		Inj	4	1	2	3	64,7	Left	(64) Obstruction/Debris (7) Failure to Yield Right of Way
3024	6/5/2006	11:53		Inj	1	1	1	1		RAng	
3025	6/7/2006	20:10		PDO	1	1	1	1	, 17	RAng	(17) Traffic Control Disregarded
3026	8/24/2006	15:43		PDO	1	1	1	1	17	RAng	(17) Traffic Control Disregarded
3027	8/22/2006	16:21		PDO	1	1	1	2	7	Rght	(7) Failure to Yield Right of Way
3028	11/20/2006	10:15		PDO	1	1	2	2	17	RAng	(17) Traffic Control Disregarded
3029	12/17/2006	20:14		PDO	4	1	2	2	, 17	RAng	(17) Traffic Control Disregarded

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: East Ave/U

County of Monroe

Town of City of Rochester

Street Name: East Ave Corridor

Route Number:

Location: East Ave/Union St

Milepost: To: Union St.

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 2

PERIOD STUDIED

From 9/13/200

To: 4/2/2008

32 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
3030	12/23/2006	10:23	6	Inj	1	1	1	2	,17	RAng	V1 hit V2, force V2 over the curb , hit parked V3&4 (17) Traffic Control Disregarded
3031	1/4/2007	11:21		Inj	1	1	1	1	17,7	RAng	V1 & 2 collided and caused V1 to spin out and strike parked V3 & 4. (17) Traffic Control Disregarded (7) Failure to Yield Right of Way
3032	1/12/2007	18:12		PDO	4	1	2	3	, 7,69	RAng	(7) Failure to Yield Right of Way (69) View Obstructed/Limited
3033	5/8/2007	11:51		PDO	1	1	1	1	7,17	RAng	(7) Failure to Yield Right of Way (17) Traffic Control Disregarded
3034	4/2/2008	20:23		PDO	3	1	1	1	7,69	Left	v2 lt out of drive, view obstructed by parked veh; was struck by V1 westbound (7) Failure to Yield Right of Way (69) View Obstructed/Limited
3035	11/2/2005	21:57		PDO	4	1	1	1	18	Left	East Ave @ Union St (18) Turning Improperly
3036	4/22/2006	21:57		PDO	4	1	1	1	,17	RAng	East Ave @ Union St (17) Traffic Control Disregarded
3037	6/7/2006	20:10		PDO	1	1	1	1	17	RAng	East Ave @ N. Union St (17) Traffic Control Disregarded
3038											Add acidents found: Pitkin St. corridor

Location: East Ave/Union

Town: City of Rochester

13-Jan-09

County: Monroe

Milepost:

To: Union St.

Time of Day	No. of Accidents	% of Total
6 AM - 10 AM	1	4.5
10:00 AM - 4 PM	6	27
4 PM - 7 PM	3	14
7 PM - 12 MID	10	45
12 MID - 6 AM	2	9.1
Unspecified	0	0
Total	22	

Direction	# Veh	% of Total
North:	17	34
South:	5	10
East:	12	24
West:	14	28
Unknown:	0	0

Direction	# Veh	% of Total
NorthEast:	1	2
NorthWest:	1	2
SouthEast:	0	0
SouthWest:	0	0
Total	50	

Weather	No. of Accidents	
Clear:	15	68
Cloudy:	4	18
Fog:	0	0
Rain:	2	9.1
Sleet:	0	0
Snow:	1	4.5
Unknown:	0	0
Total	22	

Acc. Type	# Veh	% of Total
Sideswipe:	0	0
Rear End:	1	4.5
Right Angle:	14	64
Left Turn:	4	18
Pedestrian:	0	0
Fixed Object:	0	0
Head on:	0	0

Acc. Type	# Veh	% of Total
Bicycle:	0	0
Right Turn:	2	9.1
Driveway:	0	0
Backing:	0	0
Overtaking:	0	0
Unknown:	1	4.5
Total	22	

Pavement	No. of Accidents	
Dry:	17	77
Muddy:	0	0
Other:	0	0
Slush:	0	0
Snow/Ice:	1	4.5
Wet:	4	18
Unknown:	0	0
Total	22	

Accident Severity	No. of Accidents	% of Total
Fatal:	0	0
Non-Fatal Injury:	5	23
Property damage only:	17	77
Non-reportable:	0	0
Total	22	

Type of Vehicle	No. of Accidents	% of Total
Passenger Cars:	50	94
Commercial Vehicles:	3	5.7
Total	53	

Time of Year	No. of Accidents	
Winter (Dec-Feb)	5	23
Spring (Mar-May)	3	14
Summer (Jun-Aug)	8	36
Fall (Sep-Nov)	6	27
Total	22	

Light Condition	No. of Accidents	% of Total
Dark Road-Lighted:	9	41
Dark Road-Unlighted:	0	0
Dawn:	0	0
Daylight:	12	55
Dusk:	1	4.5
Unknown:	0	0
Total	22	

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: Union St.

County of Monroe

Town of City of Rochester

Street Name: Union St. Corridor

Route Number:

Location: Union St.

Milepost: S. Union St To: E. Main St

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 1

PERIOD STUDIED

From 3/17/200

To: 5/31/200

39 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
4001	10/28/2006	2:27		PDO	4	1	2	3	20	Over	V1 ENTERED V2'S LANE AND STRUCK V2 (20) Unsafe Lane Changing
4002	7/23/2006	8:48		PDO	1	1	1	2	18	Unkn	V1 TURNED IN FRON OF V2 IN AN ATTEMPT TO TURN INTO A DRIVEWAY (18) Turning Improperly
4004	12/16/2006	0:50		PDO	4	1	1	1	18	Drvy	V1 EXITING LOT STRUCK V2 ENTERING PARKING LOT (18) Turning Improperly
4005	6/13/2006	16:15		PDO	1	1	1	1	4	FixO	V1 STRUCK PARKING SIGN (4) Driver Inattention
4006	6/11/2006	0:00		Inj	4	1	1	1	26	Rght	V1 (MOTORCYCLE) STOPPED TO turn RIGHT INTO PARKING LOT (26) Reaction to Other Univolved Vehicle
4008	5/15/2007	8:10		PDO	1	1	2	2		RAng	V2 STRUCK V1 AS V1 WAS MAKING LEFT TURN
4009	6/12/2007	8:47		PDO	1	1	1	1	7	RAng	V1 FAILED TO STOP FOR RED LIGHT & STRUCK V2 (7) Failure to Yield Right of Way
4010	7/28/2007	2:20		PDO	4	1	1	1	13,17	Left	V2 TURNED LEFT IN FRONT OF V1. V1 STRUCK V2 (13) Passing or Lane Usage Improper (17) Traffic Control Disregarded
4011	11/30/2007	23:45		PDO	4	1	1	2	18,20	Left	V2 TURNED LEFT IN FRONT OF V1, V1 STRUCK V2 (18) Turning Improperly (20) Unsafe Lane Changing
4012	12/1/2007	13:36		PDO	1	1	1	1	7	RAng	V2 RAN RED LIGHT & STRUCK V1. V2 FLED SCENE (7) Failure to Yield Right of Way
4013	4/20/2008	10:54		PDO	1	1	1	2	17	RAng	V1 WENT THRU RED LIGHT & STRUCK V2 (17) Traffic Control Disregarded
4015	10/9/2006	21:00		PDO	4	1	1	2		Back	V1 BACKED INTO V2 WHILE V2 WAS PARKED
4016	11/3/2006	22:34		PDO	4	1	1	2	13	Left	V2 TURN LEFT, V1 STRUCK V2 BOTH IN LEFT LANES (13) Passing or Lane Usage Improper
4018	5/3/2007	17:25		PDO	1	4		1	26	FixO	V1 SWERVED TO AVOID V2, STRUCK CURB (26) Reaction to Other Univolved Vehicle

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: Union St.

County of Monroe

Town of City of Rochester

Street Name: Union St. Corridor

Route Number:

Location: Union St.

Milepost: S. Union St To: E. Main St

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 2

PERIOD STUDIED

From 3/17/200

To: 5/31/200

39 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
4019	5/5/2006	8:45		PDO	1	1	1	1	4	Side	V1 STARTED TO SWITCH LANES & SIDESWIPED V2 (4) Driver Inattention
4021	3/31/2006	11:07		Inj	1	1	1	1	9	REnd	V2 STOPPED & V1 REAR-ENDED V2 (9) Following Too Closely
4022	10/30/2005	1:30		PDO	4	1	1	1	4	Back	V1 WAS PARKED & V2 WAS STOPPED AT CORNER. V1 BACKED INTO V2 (4) Driver Inattention
4023	12/10/2005	17:18		PDO	4	1	1	1	4	REnd	V2 STOPPED & TRAFFIC LIGHT & V1 REAR-ENDED V2 (4) Driver Inattention
4025	5/31/2006	23:50		PDO	4	1	1	2	4	Side	V2 PARKED. V1 TURNED RIGHT INTO THE PARK LOT STRUCK V2 (4) Driver Inattention
4026	1/22/2008	10:52		PDO	1	1	1	2	3	Back	V1 BACKING INTO DRIVEWAY & STRUCK V2 STOPPED IN TRAFFIC (3) Backing Unsafely
4027	10/12/2007	14:32		Inj	1	1	1	1	4	REnd	V1 (RTS BUS) REAR-ENDED V2. (4) Driver Inattention
4028	8/12/2007	2:41		PDO	4	1	1	1	7,17	RAng	V2 STRUCK BY V1 WHICH THEN FLED SCENE (7) Failure to Yield Right of Way (17) Traffic Control Disregarded
4029	2/16/2007	2:25		PDO	4	1	4	4	2,19	Unkn	V1 HIGH RATE OF SPEED, SLID ICY ROAD, CURB (2) Alcohol Involvement (19) Unsafe Speed
4031	5/20/2006	1:02		PDO	4	1	2	3	9,26	REnd	V2 AVOID UNKNOWN VEHICLE, REAR-ENDED BY V1 (9) Following Too Closely (26) Reaction to Other Univolved Vehicle
4032	11/17/2005	0:30		PDO	4	1	1	2	2	FixO	V1 SWERVED OFF ROAD, OVER CURB,STRUCK TREE (2) Alcohol Involvement
4033	4/4/2008	8:40		PDO	1	1	2	3	20,7	Side	V1 CHANGED LANES & struck v2 (20) Unsafe Lane Changing (7) Failure to Yield Right of Way
4035	6/9/2006	14:00		PDO	1	1	1	2	20	Left	V1 WAS CHANGING LANES WHEN IT STRUCK V2 (20) Unsafe Lane Changing
4036	8/26/2005	1:49		PDO	1	1	1	2	2,3	Left	V1 BACKING DOWN STREET INTO V2. (2) Alcohol Involvement (3) Backing Unsafely

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: Union St.

County of Monroe

Town of City of Rochester

Street Name: Union St. Corridor

Route Number:

Location: Union St.

Milepost: S. Union St To: E. Main St

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 3

PERIOD STUDIED

From 3/17/200

To: 5/31/200

39 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
4037	4/29/2006	1:34		PDO	4	1	1	1	2,19	Left	V1 TURNED LEFT, WRONG WAY,ONE WAY ST. SIDESWIPING V2 & V3 (2) Alcohol Involvement (19) Unsafe Speed
4038	3/11/2008	15:43		PDO	1	1	5	1	9	REnd	V2 PARKED WHEN V1 SWERVED V1 REAR-ENDED V2 (9) Following Too Closely
4041	5/31/2008	4:32		PDO	4	4	1	1	5	RAng	v1 VEHICLE WOULD NOT TURN & STRuCK CURB (5) Driver Inexperience
4043	3/31/2006	11:07		Inj	1	1	1	1	9	REnd	V1 EXITED INNER LOOP & STRUCK V2 (9) Following Too Closely
4044	1/2/2006	22:55		PDO	4	1	2	2	2,47	REnd	V1 REAR-ENDED V2 PARKED. (2) Alcohol Involvement (47) Tire Failure/Inadequate
4045	4/5/2008	2:45		PDO	4	1	2	2	9,66	REnd	V1 ATTEMPTED TO STOP & REAR-ENDED V2 (9) Following Too Closely (66) Pavement Slippery
4046	3/15/2008	13:50		PDO	1	1	1	2		RAng	V2 ENTERED INTERSECTION & WAS STRUCK BY V1.
4047	12/12/2007	17:59		PDO	4	1	2	4	26	REnd	V2 STOPPED TO AVOID ANOTHER V & WAS REAR-ENDED BY V1 (26) Reaction to Other Univolved Vehicle
4049	2/22/2008	19:15		PDO	4	1	2	2	4	REnd	V2 STOPPED AT RED LIGHT AND WAS REAR-ENDED BY V1. (4) Driver Inattention
4050	3/17/2005	23:41		PDO	4	1	1	1	2,3	Back	V1 TURNED THE WRONG WAY ONTO ONE-WAY STREET, THEN BACKED UP & STRUCK V2 (2) Alcohol Involvement (3) Backing Unsafely
4051	3/31/2006	11:07		Inj	1	1	1	1	9	REnd	S. Union St @ Grifith St (9) Following Too Closely
4052											Add accidents found: E. Main+ University+East Ave+Broad+Monroe corridors

Location: Union St.

Town: City of Rochester

13-Jan-09

County: Monroe

Milepost: S. Union St

To: E. Main St

Time of Day	No. of Accidents	% of Total
6 AM - 10 AM	5	13
10:00 AM - 4 PM	10	26
4 PM - 7 PM	4	10
7 PM - 12 MID	7	18
12 MID - 6 AM	13	33
Unspecified	0	0
Total	39	

Direction	# Veh	% of Total
North:	41	56
South:	9	12
East:	6	8.2
West:	6	8.2
Unknown:	0	0

Direction	# Veh	% of Total
NorthEast:	4	5.5
NorthWest:	5	6.8
SouthEast:	2	2.7
SouthWest:	0	0
Total	73	

Weather	No. of Accidents	
Clear:	19	49
Cloudy:	15	38
Fog:	0	0
Rain:	3	7.7
Sleet:	0	0
Snow:	2	5.1
Unknown:	0	0
Total	39	

Acc. Type	# Veh	% of Total
Sideswipe:	3	7.7
Rear End:	11	28
Right Angle:	7	18
Left Turn:	6	15
Pedestrian:	0	0
Fixed Object:	3	7.7
Head on:	0	0

Acc. Type	# Veh	% of Total
Bicycle:	0	0
Right Turn:	1	2.6
Driveway:	1	2.6
Backing:	4	10
Overtaking:	1	2.6
Unknown:	2	5.1
Total	39	

Pavement	No. of Accidents	
Dry:	28	74
Muddy:	0	0
Other:	0	0
Slush:	1	2.6
Snow/Ice:	1	2.6
Wet:	8	21
Unknown:	0	0
Total	38	

Accident Severity	No. of Accidents	% of Total
Fatal:	0	0
Non-Fatal Injury:	5	13
Property damage only:	34	87
Non-reportable:	0	0
Total	39	

Type of Vehicle	No. of Accidents	% of Total
Passenger Cars:	73	
Commercial Vehicles:		
Total		

Time of Year	No. of Accidents	
Winter (Dec-Feb)	8	21
Spring (Mar-May)	16	41
Summer (Jun-Aug)	8	21
Fall (Sep-Nov)	7	18
Total	39	

Light Condition	No. of Accidents	% of Total
Dark Road-Lighted:	21	54
Dark Road-Unlighted:	0	0
Dawn:	0	0
Daylight:	18	46
Dusk:	0	0
Unknown:	0	0
Total	39	

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: Monroe Av

County of Monroe

Town of City of Rochester

Street Name: Monroe Ave Corridor

Route Number:

Location: Monroe Ave

Milepost: Chestnut To: Alexander St.

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 1

PERIOD STUDIED

From 1/4/2005

To: 5/28/200

41 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
5001	5/18/2006	13:44		PDO	1	1	2	2	7	RAng	V1 WENT THRU RED LIGHT & STRUCK V2 (7) Failure to Yield Right of Way
5002	7/8/2006	12:22		PDO	1	1	1	1	9	REnd	V2 STOPPED IN TRAFFIC & WAS REAR-ENDED BY V1 (9) Following Too Closely
5003	11/7/2007	22:45		PDO	4	1	1	2	17	RAng	V1 WENT THRU A RED LIGHT & WAS STRUCK BY V2 (17) Traffic Control Disregarded
5004	5/28/2008	22:59		PDO	4	1	1	1	7,18	RAng	V1 MAKE A WRONG TURN ON A ONE WAY ST. V1 THEN MADE A U-TURN & STRUCK V2 (7) Failure to Yield Right of Way (18) Turning Improperly
5005	6/3/2006	19:52		Inj	1	1	2	2	17	RAng	V2 WENT THRU RED LIGHT & WAS STRUCK BY V1. V2 THEN STRUCK V3 (17) Traffic Control Disregarded
5006	1/4/2005	10:15		PDO	1	1	1	2	4,7	RAng	V2 ATTEMPTED TO MAKE A LEFT TURN & WAS STRUCK BY V1 (4) Driver Inattention (7) Failure to Yield Right of Way
5007	6/22/2006	8:48		PDO	1	1	1	2	4	REnd	V2 STOPPED, V1 LIGHT TURN GREEN & THOUGHT V2 HAD STARTED TO MOVE (4) Driver Inattention
5008	7/28/2006	23:05		Inj	4	1	1	1	4	REnd	V2 STOPPED TO MAKE A LEFT TURN WHEN V1 REAR-ENDED V2 (4) Driver Inattention
5009	7/5/2005	15:00		PDO	1	1	2	2	7	Side	V1 ATTEMPTED TO ENTER TRAFFIC & STRUCK V2 (7) Failure to Yield Right of Way
5010	12/31/2005	19:43		Inj	4	1	1	1	4,7	REnd	V2 STOPPED TO turn LEFT, V1 REAR-ENDED V2 (4) Driver Inattention (7) Failure to Yield Right of Way
5011	9/25/2005	15:21		PDO	1	1	1	1	17,7	RAng	V2 ran A RED LIGHT & STRUCK BY V1 (17) Traffic Control Disregarded (7) Failure to Yield Right of Way
5012	12/22/2005	0:06		PDO	4	1	2	2	18,69	Drvy	V1 EXITED PARKING LOT INTO PATH OF V2 (18) Turning Improperly (69) View Obstructed/Limited
5013	2/24/2006	9:02		PDO	1	1	2	2	7	Rght	V2 TURNED IN FRONT OF V1 & WAS STRUCK BY V1 (7) Failure to Yield Right of Way
5014	6/22/2007	17:51		PDO	1	1	1	1		Rght	V1 TURNED RIGHT & STRUCK PARKEd V2, PUSHING IT INTO V3

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: Monroe Av

County of Monroe

Town of City of Rochester

Street Name: Monroe Ave Corridor

Route Number:

Location: Monroe Ave

Milepost: Chestnut To: Alexander St.

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 2

PERIOD STUDIED

From 1/4/2005

To: 5/28/200

41 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
5015	3/28/2007	17:25		PDO	1	1	1	1	9	REnd	V1 REAR-ENDED V2 (9) Following Too Closely
5016	3/31/2008	14:33		PDO	1	1	1	2	26,26	REnd	V1 REAR-ENDED V2 (26) Reaction to Other Univolved Vehicle (26) Reaction to Other Univolved Vehicle
5017	7/22/2005	16:47		PDO	1	1	1	1	7	Side	V1 PULLED INTO TRAFFIC FROM CURB & STRUCK V2 (7) Failure to Yield Right of Way
5019	9/28/2007	0:15		PDO	4	1	1	1		Side	V2 PARKED , STRUCK BY ANOTHER VEHICLE
5020	4/5/2008			PDO		1			13	Side	V1 (UNKNOWN) SIDESWIPED V2 & V3 AS both PARKED (13) Passing or Lane Usage Improper
5023	3/14/2008	14:08		Inj	1	1	1	2	9,42	REnd	V2 SLOWED FOR TRAFFIC, V1 REAR-ENDED V2. (9) Following Too Closely (42) Brakes Defective
5024	3/14/2008	14:08		Inj	1	1	1	2	9,42	REnd	V2 SLOWED FOR TRAFFIC, V1 REAR-ENDED V2. (9) Following Too Closely (42) Brakes Defective
5025	7/13/2007	2:11		Inj	4	1	2	3	4	Rght	V1 WRONG WAY-ONE WAY ST.,TURNED RIGHT & STRUCK PEDESTRIAN (4) Driver Inattention
5026	6/13/2005	14:36		PDO	1	1	1	1	9	REnd	V2 STOPPED IN TRAFFIC & WAS REAR-ENDED BY V1 (9) Following Too Closely
5028	7/8/2005	2:08		PDO	4	1	1	1	2,13	REnd	V2 PARKED. V1 REAR-ENDED V2, THEN STRUCK SIGN & WALL (2) Alcohol Involvement (13) Passing or Lane Usage Improper
5029	12/21/2005	15:49		Inj	1	1	2	2	9	REnd	V2 STOPPED FOR LIGHT WHEN LIGHT TURNED GREEN, V1 REAR-ENDED V2 (9) Following Too Closely
5031	2/19/2006	1:58		PDO	4	1	2	1		REnd	V2 PARKED. V1 STRUCK V2 & FLED SCENE.
5032	9/27/2005	1:10		PDO	4	1	1	1		FixO	V1 OVER CURB & STRUCK TREE
5033	10/7/2005	13:20		PDO	1	1	2	3	7	Rght	V1 PULLED FROM CURB INTO TRAFFIC & STRUCK V2 (7) Failure to Yield Right of Way

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: Monroe Av

County of Monroe

Town of City of Rochester

Street Name: Monroe Ave Corridor

Route Number:

Location: Monroe Ave

Milepost: Chestnut To: Alexander St.

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 3

PERIOD STUDIED

From 1/4/2005

To: 5/28/200

41 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
5034	2/18/2007	7:30		Inj	1	1	1	1	66	Unkn	V1 SLIDE ON SLIPPERY PAVEMENT & STRUCK GUIDE RAIL. (66) Pavement Slippery
5035	5/25/2007	9:58		Inj	1	1	1	1	7,7	RAng	V1 STRUCK V2 WHICH WAS IN THE INTERSECTION. (7) Failure to Yield Right of Way (7) Failure to Yield Right of Way
5036	4/8/2007	19:06		PDO	1	1	1	2	60,13	Side	V1 STOPPED MAKE A LEFT TURN. V2 PASS V1 ON LEFT. V1 THEN STRUCK V2 (60) Other Vehicular (13) Passing or Lane Usage Improper
5037	8/20/2007	14:13		PDO	1	1	2	3	17	RAng	V2 STOPPED, WHEN LIGHT CHANGED V2 ENTERED INTERSECTION & STRUCK BY V1 (17) Traffic Control Disregarded
5038	8/17/2007	17:26		PDO	1	1	2	3	9,66	REnd	V1 REAR-ENDED V2, PUSHING IT INTO V3 (9) Following Too Closely (66) Pavement Slippery
5040	3/19/2006	2:30		PDO	4	4	1	1	13	FixO	D1 STRUCK THE MEDIAN and sign (13) Passing or Lane Usage Improper
5041	7/3/2006	1:56		Fat	4	4	1	1		FixO	V1 (MOTORCYCLE) LOST CONTROL & HIT CURB, LIGHT POLE
5042	9/5/2006	20:08		Inj	4	1	1	2	17	RAng	V1 WENT THRU A RED LIGHT & STRUCK V2 (17) Traffic Control Disregarded
5044	9/19/2006	10:07		PDO	1	1	1	1	17	RAng	V1 (BUS) ENTERED THE INTERSECTION & STRUCK V2. (17) Traffic Control Disregarded
5047	12/27/2005	17:34		Inj	4	1	1	2	,7	Left	Ref. Mrkr. 31 4303 2042 (7) Failure to Yield Right of Way
5048	10/26/2007	15:54		Inj	1	1	2	3		REnd	Ref. Mrkr. 31 4303 2042
5049	12/3/2007	11:40		Inj	1	1	2	4	4,4	RAng	Ref. Mrkr. 31 4303 2042 (4) Driver Inattention (4) Driver Inattention
5051	3/16/2007	21:20		PDO	4	1	4	4	18,60	REnd	V1 was parallel parking and struck V2, turning improperly, other vehicular (18) Turning Improperly (60) Other Vehicular
5052	5/30/2006	11:22		Inj	1	1	1	1	,14	Bike	Monroe Ave @ Linwood Pl (14) Pedestrian's Error/Confusion

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: Monroe Av

County of Monroe

Town of City of Rochester

Street Name: Monroe Ave Corridor

Route Number:

Location: Monroe Ave

Milepost: Chestnut To: Alexander St.

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 4

PERIOD STUDIED

From 1/4/2005

To: 5/28/200

41 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
5053	5/21/2007	15:00		PDO	1	1	1	1	4,7	REnd	V1 stoped at signal then drove forward and struck V2, inattatention, failure to yield (4) Driver Inattention (7) Failure to Yield Right of Way
5054	11/3/2005	0:15		PDO	4	1	1	1	4	H-On	V1 struck median and sign post, driver inattention (4) Driver Inattention
5055	7/4/2006	23:14		PDO	4	1	1	1	42	REnd	V1 rear ended V2 who was stopped at light. V1 states breaks defective (42) Brakes Defective
5056											Additional Accidents on Union Street summary

Location: Monroe Ave

Town: City of Rochester

13-Jan-09

County: Monroe

Milepost: Chestnut

To: Alexander St.

Time of Day	No. of Accidents	% of Total
6 AM - 10 AM	4	9.1
10:00 AM - 4 PM	17	39
4 PM - 7 PM	5	11
7 PM - 12 MID	9	20
12 MID - 6 AM	9	20
Unspecified	0	0
Total	44	

Direction	# Veh	% of Total
North:	9	11
South:	13	16
East:	39	48
West:	12	15
Unknown:	0	0

Direction	# Veh	% of Total
NorthEast:	2	2.4
NorthWest:	4	4.9
SouthEast:	2	2.4
SouthWest:	1	1.2
Total	82	

Weather	No. of Accidents	
Clear:	22	50
Cloudy:	15	34
Fog:	0	0
Rain:	5	11
Sleet:	0	0
Snow:	2	4.5
Unknown:	0	0
Total	44	

Acc. Type	# Veh	% of Total
Sideswipe:	5	11
Rear End:	17	38
Right Angle:	11	24
Left Turn:	1	2.2
Pedestrian:	0	0
Fixed Object:	3	6.7
Head on:	1	2.2

Acc. Type	# Veh	% of Total
Bicycle:	1	2.2
Right Turn:	4	8.9
Driveway:	1	2.2
Backing:	0	0
Overtaking:	0	0
Unknown:	1	2.2
Total	45	

Pavement	No. of Accidents	
Dry:	30	68
Muddy:	0	0
Other:	0	0
Slush:	0	0
Snow/Ice:	1	2.3
Wet:	13	30
Unknown:	0	0
Total	44	

Accident Severity	No. of Accidents	% of Total
Fatal:	1	2.2
Non-Fatal Injury:	14	31
Property damage only:	30	67
Non-reportable:	0	0
Total	45	

Type of Vehicle	No. of Accidents	% of Total
Passenger Cars:	87	
Commercial Vehicles:		
Total		

Time of Year	No. of Accidents	
Winter (Dec-Feb)	9	20
Spring (Mar-May)	13	29
Summer (Jun-Aug)	14	31
Fall (Sep-Nov)	9	20
Total	45	

Light Condition	No. of Accidents	% of Total
Dark Road-Lighted:	17	39
Dark Road-Unlighted:	0	0
Dawn:	0	0
Daylight:	27	61
Dusk:	0	0
Unknown:	0	0
Total	44	

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: East Broad

County of Monroe

Town of City of Rochester

Street Name: E. Broad St Corridor

Route Number:

Location: East Broad St

Milepost: Savanah St To: Union St

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 1

PERIOD STUDIED

From 10/23/20

To: 5/23/200

32 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
7004	5/4/2007	4:05		PDO	4	1	1	1	17	FixO	V1 TURNED LEFT & DROVE OVER MEDIAN & SIGN. (17) Traffic Control Disregarded
7005	11/4/2006	23:39		PDO	4	1	1	1	13	FixO	V1 FAILED TO STOP AT STOP SIGN, WENT ACROSS INTERSECTION & HIT THE FIRE HYDRANT (13) Passing or Lane Usage Improper
7006	10/23/2005	14:05		PDO	1	1	2	3	4,20	Side	V1 SIDESWIPED V2. V2 DROVE OVER MEDIAN & OVER A STREET SIGN (4) Driver Inattention (20) Unsafe Lane Changing
7007	2/19/2006	2:55		PDO	4	1	4	1	66	Unkn	V1 SLID ON BLACK ICE INTO CURB (66) Pavement Slippery
7008	10/15/2007	14:05		PDO	1	1	1	1	17, 17	RAng	(17) Traffic Control Disregarded (17) Traffic Control Disregarded
7009	5/23/2008	12:40		PDO	1	1	1	1	17,13	Left	V1 making left out of lot went wrong way down browd st hit v2 going EB (17) Traffic Control Disregarded (13) Passing or Lane Usage Improper
7010											Add accidents found: Pitkin St + Union St Corridors

Location: East Broad St

Town: City of Rochester

13-Jan-09

County: Monroe

Milepost: Savanah St **To:** Union St

Time of Day	No. of Accidents	% of Total
6 AM - 10 AM	0	0
10:00 AM - 4 PM	3	50
4 PM - 7 PM	0	0
7 PM - 12 MID	1	17
12 MID - 6 AM	2	33
Unspecified	0	0
Total	6	

Direction	# Veh	% of Total
North:	1	11
South:	1	11
East:	5	56
West:	2	22
Unknown:	0	0

Direction	# Veh	% of Total
NorthEast:	0	0
NorthWest:	0	0
SouthEast:	0	0
SouthWest:	0	0
Total	9	

Weather	No. of Accidents	
Clear:	5	83
Cloudy:	0	0
Fog:	0	0
Rain:	1	17
Sleet:	0	0
Snow:	0	0
Unknown:	0	0
Total	6	

Acc. Type	# Veh	% of Total
Sideswipe:	1	17
Rear End:	0	0
Right Angle:	1	17
Left Turn:	1	17
Pedestrian:	0	0
Fixed Object:	2	33
Head on:	0	0

Acc. Type	# Veh	% of Total
Bicycle:	0	0
Right Turn:	0	0
Driveway:	0	0
Backing:	0	0
Overtaking:	0	0
Unknown:	1	17
Total	6	

Pavement	No. of Accidents	
Dry:	4	67
Muddy:	0	0
Other:	0	0
Slush:	0	0
Snow/Ice:	1	17
Wet:	1	17
Unknown:	0	0
Total	6	

Accident Severity	No. of Accidents	% of Total
Fatal:	0	0
Non-Fatal Injury:	0	0
Property damage only:	6	100
Non-reportable:	0	0
Total	6	

Type of Vehicle	No. of Accidents	% of Total
Passenger Cars:	9	
Commercial Vehicles:		
Total		

Time of Year	No. of Accidents	
Winter (Dec-Feb)	1	17
Spring (Mar-May)	2	33
Summer (Jun-Aug)	0	0
Fall (Sep-Nov)	3	50
Total	6	

Light Condition	No. of Accidents	% of Total
Dark Road-Lighted:	3	50
Dark Road-Unlighted:	0	0
Dawn:	0	0
Daylight:	3	50
Dusk:	0	0
Unknown:	0	0
Total	6	

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: Pitkin St

County of Monroe

Town of City of Rochester

Street Name: Pitkin St

Route Number:

Location: Pitkin St

Milepost: E. Main St To: Chestnut/Mon

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 1

PERIOD STUDIED

From 10/23/20

To: 5/23/200

32 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
7004	5/4/2007	4:05		PDO	4	1	1	1	17	FixO	V1 TURNED LEFT & DROVE OVER MEDIAN & SIGN. (17) Traffic Control Disregarded
7005	11/4/2006	23:39		PDO	4	1	1	1	13	FixO	V1 FAILED TO STOP AT STOP SIGN, WENT ACROSS INTERSECTION & HIT THE FIRE HYDRANT (13) Passing or Lane Usage Improper
7006	10/23/2005	14:05		PDO	1	1	2	3	4,20	Side	V1 SIDESWIPED V2. V2 DROVE OVER MEDIAN & OVER A STREET SIGN (4) Driver Inattention (20) Unsafe Lane Changing
7007	2/19/2006	2:55		PDO	4	1	4	1	66	Unkn	V1 SLID ON BLACK ICE INTO CURB (66) Pavement Slippery
7008	10/15/2007	14:05		PDO	1	1	1	1	17, 17	RAng	(17) Traffic Control Disregarded (17) Traffic Control Disregarded
7009	5/23/2008	12:40		PDO	1	1	1	1	17,13	Left	V1 making left out of lot went wrong way down browd st hit v2 going EB (17) Traffic Control Disregarded (13) Passing or Lane Usage Improper
7010											Add accidents found: Pitkin St + Union St Corridors

Location: Pitkin St

Town: City of Rochester

13-Jan-09

County: Monroe

Milepost: E. Main St **To:** Chestnut/Monro

Time of Day	No. of Accidents	% of Total
6 AM - 10 AM	2	17
10:00 AM - 4 PM	5	42
4 PM - 7 PM	1	8.3
7 PM - 12 MID	3	25
12 MID - 6 AM	1	8.3
Unspecified	0	0
Total	12	

Direction	# Veh	% of Total
North:	0	0
South:	10	43
East:	3	13
West:	9	39
Unknown:	0	0

Direction	# Veh	% of Total
NorthEast:	0	0
NorthWest:	0	0
SouthEast:	0	0
SouthWest:	1	4.3
Total	23	

Weather	No. of Accidents	
Clear:	5	42
Cloudy:	3	25
Fog:	0	0
Rain:	2	17
Sleet:	0	0
Snow:	2	17
Unknown:	0	0
Total	12	

Acc. Type	# Veh	% of Total
Sideswipe:	0	0
Rear End:	5	42
Right Angle:	3	25
Left Turn:	0	0
Pedestrian:	1	8.3
Fixed Object:	0	0
Head on:	0	0

Acc. Type	# Veh	% of Total
Bicycle:	0	0
Right Turn:	1	8.3
Driveway:	0	0
Backing:	0	0
Overtaking:	1	8.3
Unknown:	1	8.3
Total	12	

Pavement	No. of Accidents	
Dry:	7	58
Muddy:	0	0
Other:	0	0
Slush:	0	0
Snow/Ice:	2	17
Wet:	3	25
Unknown:	0	0
Total	12	

Accident Severity	No. of Accidents	% of Total
Fatal:	0	0
Non-Fatal Injury:	1	8.3
Property damage only:	11	92
Non-reportable:	0	0
Total	12	

Type of Vehicle	No. of Accidents	% of Total
Passenger Cars:	23	
Commercial Vehicles:		
Total		

Time of Year	No. of Accidents	
Winter (Dec-Feb)	4	33
Spring (Mar-May)	4	33
Summer (Jun-Aug)	2	17
Fall (Sep-Nov)	2	17
Total	12	

Light Condition	No. of Accidents	% of Total
Dark Road-Lighted:	5	42
Dark Road-Unlighted:	0	0
Dawn:	0	0
Daylight:	7	58
Dusk:	0	0
Unknown:	0	0
Total	12	

Department of **Transportation**
Monroe County, New York

Maggie Brooks
County Executive

Terrence J. Rice, P.E.
Director

March 3, 2009

Mr. James R. McIntosh
City Engineer
City Hall
30 Church Street
Rochester, NY 14614

RE: **INNER LOOP STUDY, PHASE II, E. MAIN ST. TO I-490 - GO/NO GO ANALYSIS**

Dear ~~Mr.~~ Jim McIntosh:

We have completed our review of the draft Go/No Go analysis report dated January 13, 2009 for the above referenced project and we offer the following comments.

General Comments

1. We agree with the report's conclusions that further study of the Inner Loop between Monroe Avenue/Chestnut Street and East Avenue, of the Inner Loop at Main Street, and of the proposed new westbound I-490 off ramp to the Inner Loop is appropriate.

2. The two at-grade alternatives shown in the report for the Inner Loop at Main Street do not appear to be practical due to the number of lanes shown. The excess width may not create a suitable pedestrian environment, and the accident analysis indicates an existing problem with sideswipe/overtaking accidents, which would be aggravated if more lanes were added. Therefore, we believe that other options should be explored beyond those identified in the report.

3. We believe that the proposed I-490 westbound off-ramp to the Inner Loop is a desirable alternative to improve access for I-490 westbound traffic. The report should include sketches of the proposed layout, similar to those contained in the January 22, 2009 meeting handout.

4. NYSDOT guidelines stipulate that roundabouts should be considered first before signalization. Have roundabouts been considered for the Inner Loop intersections with Main Street/University Avenue, Chestnut Street/Monroe Avenue, Broad Street, and East Avenue?

5. Although the grade separated eastern portion of the Inner Loop does not have the level of volumes as the remainder of the Inner Loop, it does not follow that this section of road has no purpose, as was stated on Page 5. It serves as a connecting route between the east side of downtown and I-490 to/from the west. However, the lack of a direct connection from I-490 westbound limits the usefulness of this section of road, and we would agree that that this section of the Inner Loop would not be likely to attract more traffic if it was raised to grade without any modifications to the access from I-490 westbound.

6. The options are identified as #1, #2, and #4. They should either be renumbered or an explanation should be provided concerning what option #3 was and why it is not further discussed in the report.

6100 City Place • 50 West Main Street • Rochester, New York 14614-1231
(585) 753-7720 • *fax* (585) 753-7730 • *www.monroecounty.gov*

Technical Comments

7. Pg 6 – The report should explain how the traffic volumes were adjusted to account for the road closures associated with the I-490 Western Gateway.

8. Pg 9 – In the top figure, the intersection of Chestnut/Monroe/Raised Inner Loop should show two (2) receiving eastbound lanes, and the eastbound approach should consist of a left, thru, and shared thru/right lane, so that eastbound through vehicles do not get trapped.

9. Pg 9 – In the bottom figure, the East Ave/Inner Loop intersection does not show left turn lanes on East Avenue. We anticipate that dedicated left turn lanes will be needed to handle the projected traffic volumes and to provide adequate line of sight for opposing left turning vehicles.

10. Pg 9 – The bottom figure shows Broad Street intersecting the Inner Loop as a six lane roadway. The volumes do not justify such a cross section, and its narrowing is being studied as part of the City's Broad/Court/Chestnut project. Additionally, consideration should be given to extending Broad Street to the east of Union Street.

11. Pg 12 – The Level of Service table should include information for each approach and lane group.

12. Pg 14 – The existing average speeds shown in the table would be too low for a grade separated facility. The report should clarify that the existing network included the mainline, the frontage roads, and some adjacent signalized intersections.

13. Pg 12 & Attachment B – Some discrepancies were found between the LOS tables and the Synchro files, specifically in the 2035 PM scenario.

14. Attachment C – The queue analysis table attached includes several table cells containing a "?". Please add the missing information.

15. Attachment D – The "Inner Loop Accident Data" section appears to include linear sections for both the Inner Loop frontage roads and the Inner Loop main line. The main line and frontage roads are very different in character and should be discussed separately. Given their different character, comparing both to the same statewide accident rates for "principal arterial expressways" does not seem appropriate.

16. Please confirm that only reportable accidents were used to calculate the accident rates. Although the report states that this was the case, it seems unusual that so many intersections would substantially exceed the average accident rates.

17. Attachment D – We recommend separating the accident plot diagrams into one diagram for each year so that the accident trends over time for a given location can be visually recognized.

18. Attachment D – For the East Main Street corridor discussion, please add that a portion of Main Street east of Union St was studied by MCDOT as part of a PIL in July 2006, resulting in traffic signal timing changes that improved the progression on East Main Street.

19. Attachment D – The report should include a discussion about any notable accident patterns that were identified in the collision diagrams, such as the northbound/eastbound right angle accident patterns shown at both Monroe Avenue/Union Street and East Avenue/Union Street.

20. Attachment D – The sections of I-490 shown in diagrams 7, 8, and 9 were under construction during some of the years studied in the accident analysis. This should be clearly identified and discussed in the report.

21. Chestnut/Woodbury, Monroe/Inner Loop, and Broad/Inner Loop – The analysis should use a 100 second cycle length in the AM, show each signal as coordinated, and include all pedestrian timing requirements to ensure that there is enough split time being provided for pedestrians to cross the street.

22. Union/University – For safety reasons, the proposed southbound dual lefts on Union Street at University Avenue should be modeled as a protected only left turn.

23. Main/University/Pitkin – The westbound left turn lane on Main Street at Pitkin Street/University Avenue should be included in all models.

Grammatical Comments

24. Pg 2, # 4. – Replace "turning movements" with "individual movements" to better describe the Level of Service results.

25. Attachment A – Please correct the many grammatical errors in Inner Loop Study Area Analysis Memo. Also, the Inner Loop Volume Comparison Locations (2014) map should read "Raised" not "Raise".

26. Attachment A – For better clarity, we suggest saying "due to random variations within the model" instead of "the result of running the model twice".

We look forward to reviewing a revised report with the above comments addressed. If you have any questions or require additional information, please contact me at 753-7755.

Sincerely,

James R. Pond

James R. Pond, P.E., PTOE
Associate Traffic Engineer

JRP:mlp

xc: T. Rice
S. Leathersich
M. Partelow
D. Goehring, NYSDOT
J. Hoffman, Stantec

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MEMORANDUM
DEPARTMENT OF TRANSPORTATION

TO: Marvin Kleinberg
FROM: David Goehring, Regional Traffic Engineer
SUBJECT: **Comments on Raising the Eastern Portion of the Inner Loop**

DATE: February 24, 2009

We have reviewed the January 13, 2009 memo and supporting documents for Raising the Eastern Portion of the Inner Loop from William Holtoff of Stantec. For the Go/No Go decision on whether to proceed with a more detailed study, we have the following comments.

In regards to the recommendations and conclusions made, we agree with the Go decision for the Inner Loop between Chestnut/Monroe and East Avenue, and with the Go decision for the Westbound I-490 off ramp to the Inner Loop. However we recommend a No Go decision for the Inner Loop at Main Street.

Our No Go decision for a raised Inner Loop at Main Street is based on the following.

1. As stated in the analysis, vehicle storage in the area of University Avenue/South Union Street/Main Street is an issue now and will remain so into the future for the existing Inner Loop or raised Inner Loop. Since this is a problem now, this project does not justify the need to add more points of conflict, reduce the storage lengths, and add more traffic to an area that already has issues. This option will increase delays and potentially decrease safety. We should not be adding lanes and introducing complex traffic signal phasing to address new problems.

2. For some approaches lane utilization is an issue that will significantly increase queue lengths which presents some safety concerns. Queue lengths are likely to extend into adjacent intersections or extend beyond storage lengths. This is apparent through a review of SimTraffic and the Inner Loop approaches to Main Street.

3. We have concerns regarding a highway with relatively high speeds entering an area that is congested with long queue lengths. Since sight distance approaching Main Street from the Inner Loop may be restricted, this also may become a safety issue with increases in high speed rear end accidents.

4. With the introduction of more intersections and lanes, it will be significantly more difficult for pedestrians to traverse through this area.

In general we have the following comments regarding the supporting documents.

1. In the areas of the Inner Loop at grade, what restrictions on access are proposed? Is a raised median proposed or will some sections be right-of-way without access?

2. At a traffic signal where there are three or more through lanes opposing a left turn movement, the left turn movement is generally controlled by a protected only left turn arrow.

3. In the SYNCHRO analysis, the lost time adjustment should be zero, the percentage of heavy vehicles is much greater than the default value of 2 percent and as stated above the lane utilization will differ on certain approaches to an intersection. Each of these inputs will impact the capacity of an intersection.

4. We agree with the consideration of a roundabout alternative at each intersection.

Memo

DRAFT

Stantec

To:	John Thomas	From:	Paula Benway Rochester, New York
File:	Inner Loop 192500170	Date:	April 24, 2009

A draft Go/No Go Analysis for Raising the Eastern Portion of the Inner Loop was prepared and documented in a memo to the City of Rochester dated January 13, 2009. This memo was shared and reviewed by the technical advisory committee. Formal comments were received as follows:

- Monroe County Department of Transportation, March 3, 2009
- New York State Department of Transportation, February 24, 2009

This memo serves to address the comments received. A copy of the correspondence from MCDOT and NYSDOT are attached.

Monroe County DOT

MCDOT Comment 1: We agree with the report's conclusions that further study of the Inner Loop between Monroe Avenue/Chestnut Street and East Avenue, of the Inner Loop at Main Street, and of the proposed new westbound I-490 off ramp to the Inner Loop is appropriate.

Response: no response necessary.

MCDOT Comment 2: The two at-grade alternatives shown in the report for the Inner Loop at Main Street do not appear to be practical due to the number of lanes shown. The excess width may not create a suitable pedestrian environment, and the accident analysis indicates an existing problem with sideswipe/overtaking accidents, which would be aggravated if more lanes were added. Therefore, we believe that other options should be explored beyond those identified in the report.

Response: Initial attempt was to determine if an option to bring the Inner Loop up to grade at Main Street was possible; as documented. Additional alternatives at Main Street will be developed and evaluated to minimize some of the concerns noted as part of the next phase of the project.

MCDOT Comment 3: We believe that the proposed I-490 westbound off-ramp to the Inner Loop is a desirable alternative to improve access for I-490 westbound traffic. The report should include sketches of the proposed layout, similar to those contained in the January 22, 2009 meeting handout.

Response: A concept sketch will be included.

MCDOT Comment 4: NYSDOT guidelines stipulate that roundabouts should be considered first before signalization. Have roundabouts been considered for the Inner Loop intersections with Main Street/ University Avenue, Chestnut Street/Monroe Avenue, Broad Street, and East Avenue?

Response: Alternative refinement, including consideration and modeling of roundabouts at each of the intersections is part of the next phase of the project.

MCDOT Comment 5: Although the grade separated eastern portion of the Inner Loop does not have the level of volumes as the remainder of the Inner Loop, it does not follow that this section of road has no purpose, as was stated on Page 5. It serves as a connecting route between the east side of downtown and I-490 to/from the west. However, the lack of a direct connection from I-490 westbound limits the usefulness of this section of road, and we would agree that this section of the Inner Loop would not be likely to attract more traffic if it was raised to grade without any modifications to the access from I-490 westbound.

Response: so noted.

MCDOT Comment 6: The options are identified as #1, #2, and #4. They should either be renumbered or an explanation should be provided concerning what option #3 was and why it is not further discussed in the report.

Response: so noted.

MCDOT Comment 7: Pg 6- the report should explain how the traffic volumes were adjusted to account for the road closures associated with the I-490 Western Gateway.

Response: The text has been edited to clarify how the volumes were adjusted.

MCDOT Comment 8: Pg 9 – In the top figure, the intersection of Chestnut/Monroe/ Raised Inner Loop should show two (2) receiving eastbound lanes, and the eastbound approach should consist of a left, through, and shared thru/right lane, so that eastbound through vehicles do not get trapped.

Response: The synchro analysis was adjusted accordingly.

MCDOT Comment 9: Pg 9 – In the bottom figure, the East Avenue/Inner Loop intersection does not show left turn lanes on East Avenue. We anticipate that dedicated left turn lanes will be needed to handle the projected traffic volumes and to provide adequate line of sight for opposing left turning vehicles.

Response: Preliminary analysis indicates this intersection to operate at good levels today and in the future. Due to the relatively tight ROW with existing buildings on the southeast and northeast corners, the feasibility of opposing left turn lanes without impacts to adjacent properties is low. This will be considered in the next phase of the project as other alternatives or refinements will be further evaluated.

MCDOT Comment 10: Pg 9 – The bottom figure shows Broad Street intersecting the Inner Loop as a six lane roadway. The volumes do not justify such a cross section, and its narrowing is being studied as part of the City's Broad/Court/Chestnut project. Additionally, consideration should be given to extending Broad Street to the east of Union Street.

Response: Updated information on the Broad/Court/Chestnut project is appreciated. Subsequent analysis of this intersection will show the reduced number of lanes on the Broad Street approach.

MCDOT Comment 11: Pg 12 – The Level of Service table should include information for each approach and lane group.

Response: A detailed level of service table by approach/lane group is provided in Attachment B.

MCDOT Comment 12: Pg 14 – The existing average speeds shown in the table would be too low for a grade separated facility. The report should clarify that the existing network included the mainline, the frontage roads, and some adjacent signalized intersections.

Response: Correct, the average speeds shown on the table are inclusive of all roadways and intersections within the study area; clarification will be provided.

MCDOT Comment 13: Pg 12 & Attachment B – Some discrepancies were found between the LOS tables and the Synchro files, specifically in the 2035 PM scenario.

Response: The level of service tables has been updated.

MCDOT Comment 14: Attachment C – The queue analysis table attached includes several table cells containing a "?". Please add the missing information.

Response: The table has been updated.

MCDOT Comment 15: Attachment D – The "Inner Loop Accident Data" section appears to include linear sections for both the Inner Loop frontage roads and the Inner Loop main line. The main line and frontage roads are very different in character and should be discussed separately. Given their different character, comparing both to the same statewide accident rates for "principal arterial expressways" does not seem appropriate.

Response: The accidents reported in this category occurred on the Inner Loop mainline only. Accidents on the frontage roads were not included in the linear accident rate calculation.

MCDOT Comment 16: Please confirm that only reportable accidents were used to calculate the accident rates. Although the report states that this was the case, it seems unusual that so many intersections would substantially exceed the average accident rates.

Response: Only reportable accidents were used to calculate the accident rates.

MCDOT Comment 17: Attachment D – We recommend separating the accident plot diagrams into one diagram for each year so that the accident trends over time for a given location can be visually recognized.

Response: With such a large study area, providing collision diagrams per year would triple the number of diagrams needed. Instead, a summary report from the database that shows how many accidents occurred per location per year is provided. This may assist in determining an increase or decrease in crashes from year to year.

MCDOT Comment 18: Attachment D – For the East Main Street corridor discussion, please add that a portion of Main Street east of Union St was studied by MCDOT as part of a PIL in July 2006, resulting in traffic signal timing changes that improved the progression on East Main Street.

Response: Update on the PIL investigation result has been added.

MCDOT Comment 19: Attachment D – The report should include a discussion about any notable accident patterns that were identified in the collision diagrams, such as the northbound/eastbound right angle accident patterns shown on both Monroe Avenue/Union Street and East Avenue/Union Street.

Response: A discussion of the accident patterns at these intersections is on page 3 and 4.

MCDOT Comment 20: Attachment D – The sections of I-490 shown in diagrams 7, 8, and 9 were under construction during some of the years studied in the accident analysis. This should be clearly identified and discussed in the report.

Response: This clarification has been added to the report.

MCDOT Comment 21: Chestnut/Woodbury, Monroe/Inner Loop, and Broad/Inner Loop – The analysis should use a 100 second cycle length in the AM, Show each signal as coordinated, and include all pedestrian timing requirements to ensure that there is enough split time being provided for pedestrians to cross the street.

Response: The analysis has been updated.

MCDOT Comment 22: Union/University – For safety reasons, the proposed southbound dual lefts on Union Street at University Avenue should be modeled as a protected only left turn.

Response: The analysis has been updated.

MCDOT Comment 23: Main/University/Pitkin – the westbound left turn lane on Main Street at Pitkin Street/University Avenue should be included in all models.

Response: The analysis has been updated.

MCDOT Comment 24: Pg 2, #4 – Replace "turning movements" with "individual movements" to better describe the Level of Service results.

Response: so noted

MCDOT Comment 25: Attachment A – Please correct the many grammatical errors in Inner Loop Study Area Analysis Memo. Also, the Inner Loop Volume Comparison Locations (2014) map should read "Raised" not "Raise".

Response: so noted

MCDOT Comment 26: Attachment A – for better clarity, we suggest saying "due to random variations within the model" instead of "the result of running the model twice".

Response: so noted

New York State DOT

NYSDOT Comment 1: As stated in the analysis, vehicle storage in the area of University Avenue/South Union Street/Main Street is an issue now and will remain so into the future for the existing Inner Loop or raised Inner Loop. Since this is a problem now, this project does not justify the need to add more points of conflict reduce the storage lengths, and add more traffic to an area that already has issues. This option will increase delays and potentially decrease safety. We should not be adding lanes and introducing a complex traffic signal phasing to address new problems.

Response: no response necessary.

NYSDOT Comment 2: For some approaches lane utilization is an issue that will significantly increase queue lengths which presents some safety concerns. Queue lengths are likely to extend into adjacent intersections or extend beyond storage lengths. This is apparent through a review of SimTraffic and the Inner Loop approaches to Main Street.

Response: So noted, efforts have been made to adjust lane utilization factors as much as possible to resemble actual operations.

NYSDOT Comment 3: We have concerns regarding a highway with relatively high speeds entering an area that is congested with long queue lengths. Since sight distance approaching Main Street from the Inner Loop may be restricted, this also may become a safety issue with increases in high speed rear end accidents.

Response: Both issues noted would normally be identified and addressed in a later phase of the project. Future consideration will be given to these items.

NYSDOT Comment 4: With the introduction of more intersections and lanes, it will be significantly more difficult for pedestrians to traverse through this area.

Response: As the number of travel lanes increase the more difficult it can be for a pedestrian, however, as the project alternatives are refined the introduction of refuge islands where applicable or other pedestrian friendly amenities will be considered to minimize this concern.

New York State DOT – Supporting Documents

NYSDOT Comment 1: In the areas of the Inner Loop at grade, what restrictions on access are proposed? Is a raised median proposed or will some sections be right-of-way without access.

Response: At this point, no definitive recommendation has been made related to the level of access that will be provided along the Inner Loop at grade sections. This will be identified and discussed in later phases of this project.

NYSDOT Comment 2: At a traffic signal where there are three or more through lanes opposing a left turn movement, the left turn movement is generally controlled by a protected only left turn arrow.

Response: The analysis has been updated.

NYSDOT Comment 3: In the SYNCHRO analysis, the lost time adjustment should be zero, the percentage of heavy vehicles is much greater than the default value of 2 percent and as stated above the lane utilization will differ on certain approaches to an intersection. Each of these inputs will impact the capacity of an intersection.

Response: The analysis has been updated to reflect zero lost time. Actual heavy vehicles percentages obtained during the traffic counts have been used in the analysis.

NYSDOT Comment 4: We agree with the consideration of a roundabout alternative at each intersection.

Response: Roundabout feasibility and analysis will be performed in the next step of the project.

STANTEC CONSULTING SERVICES INC.

Paula Benway
Associate, Transportation
Paula.Benway@stantec.com

Attachments: MCDOT, March 3, 2009
NYSDOT, February 24, 2009

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APPENDIX G

Traffic Analysis

Appendix G – Traffic Analysis Contents

2035 Alternative Development Memo – Page 3
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2015 ETC Conditions – Page 147
2035 No Build Conditions – Page 191
2035 Preferred Alternative – Page 233

Appendix G – Traffic Analysis
Contents

2035 Alternative Development Memo

Synchro Files (available upon request)

Stantec

Memo

To:	Jim Hofmann Jr	From:	Paula F. Benway, FITE
	Rochester NY Office		Rochester NY Office
	File Name	Date:	February 11, 2014

Reference: Inner Loop East – Intersection Alternatives – Capacity Analysis

This serves to document and evaluate the traffic capacity needs at each of the intersections within the Inner Loop East corridor. The purpose of this analysis is to evaluate all of the ideas and suggestions received from the various stakeholders along with options developed by the design team to address capacity, geometric, and pedestrian/bicycle needs at each location. The intent is to pick the most equitable intersection treatment that addresses the various needs which will form the ultimate proposed corridor alternative.

The following sections cover an overview on the traffic volumes followed by location specific option evaluation.

Traffic Volumes

The analysis was completed using the projected 2035 Future Traffic Volumes for the weekday morning and evening peak hours (attached). Some options required some redistribution of traffic, and hence, the individual volumes may not be exactly as depicted in the attached traffic volume diagrams. For example, at the corridor north terminus location, several options were evaluated for the Inner Loop ramp locations (Charlotte Street vs. Richmond Street) that altered one-way versus two-traffic patterns in the immediate area.

The traffic volumes being used as part of the analysis originated from the Project Scoping Report (PSR) where growth rates and extent of redistribution of traffic was assessed and recorded. The 2035 future "no-build" traffic volumes are the basis of the analysis and have been applied to the new at-grade urban city street environment. Since the PSR report was done some time back and development has occurred within the immediate project area, updated traffic counts were performed at a few key intersections to evaluate what has changed since the original 2008 traffic volumes were taken. While national trends indicate that traffic volumes have leveled off or even decreased over the past 10 years throughout the nation, traditional forecasting substantially overestimates the potential for traffic growth. Recent studies have revealed that traffic on roads in urban settings (arterials and collectors) was typically overestimated by a significant amount[1]. Traffic counts recently taken (September 2013) at Broad Street and at the East Avenue intersection with Union Street and Pitkin Street indicate that traffic volumes have remained at the same levels as those recorded in 2008 at the start of the PSR project. A volume comparison table is attached. Traffic volumes at the Broad Street intersections have actually decreased by 2-5% per year since 2008; that is significant. When the 2013 volumes are compared to the projected 2014 ETC volumes (one year difference), the 2013 volumes are 10%-30% lower. Bottom line, should traffic levels remain at current levels, the projected 2035 volumes may be high.

[1] Pavithra Parthasarathi and David Levinson, "Post construction Evaluation of Traffic Forecast Accuracy" Transport Policy, 2010.

Reference: Inner Loop East – Intersection Alternatives – Capacity Analysis

Traffic counts were obtained at the intersections of Broad Street and at the East Avenue intersections with Pitkin Street and Union Street during the weekday morning and evening peak. The following table summarizes a comparison to previously collected (base counts) taken in 2008 and to the projected 2014 Estimated Time of Completion volumes being used in this study.

	Comparison to 2008 Traffic				Comparison to 2014 ETC Projections			
Intersection	2008 Intersection Volume	2013 Intersection Volume	Volume Change	% / Year	2013 Intersection Volume	2014 ETC Projections	Volume Change	%
East Ave @ Union St								
Morning PH	991	985	-6	0%	985	1090	-105	-10%
Evening PH	1255	1332	77	1%	1332	1430	-98	-7%
East Ave @ Pitkin St								
Morning PH	963	1011	48	1%	1011	1078	-67	-6%
Evening PH	1084	1077	-7	0%	1077	1228	-151	-12%
Broad St @ Union St								
Morning PH	338	290	-48	-3%	290	360	-70	-19%
Evening PH	394	399	5	0%	399	476	-77	-16%
Broad St @ Pitkin St								
Morning PH	528	385	-143	-5%	385	572	-187	-33%
Evening PH	618	559	-59	-2%	559	710	-151	-21%
Roadway	2008 Volume	2013 Volume	Total Change	% / Year	2013 Volume	2014 ETC Projections	Volume Change	%
Union Street (Between Broad and East)								
Morning PH	215	215	0	0%	215	224	-9	-4%
Evening PH	340	344	4	0%	344	420	-76	-18%
Pitkin St (Between Broad and East)								
Morning PH	306	250	-56	-4%	250	336	-86	-26%
Evening PH	249	252	3	0%	252	263	-11	-4%

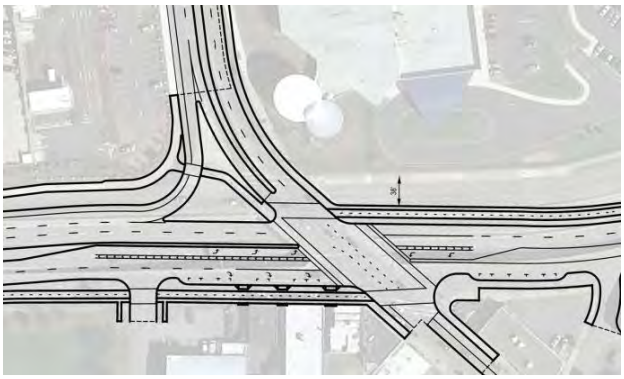
Urban traffic networks and grid systems are flexible and resilient due to their inherent connectivity. Street design should be from a network perspective and consider turn restrictions as well as the overall distribution of congestion throughout the network. Hence, while traffic projections maybe high and will be used per standard procedures, due care is warranted in determining geometric and traffic control features identified to assure that the corridor and intersections are not overdesigned.

The following presents numerous options and sub options evaluated at each corridor intersection.

Reference: Inner Loop East – Intersection Alternatives – Capacity Analysis

Monroe Avenue/Chestnut Street Intersection

Numerous intersection alternatives were considered and evaluated at this intersection and includes traditional signalized intersection, off-set T-intersections and a roundabout. Several variations for each alternative are documented below.



Alternative 1: Traditional signalized intersection as documented in preliminary conceptual layout. This alternative provides 3-lanes on the east/west approaches, with slight modifications to the north/south approaches. Acceptable levels of service (LOS D or better) and low v/c ratios would be experienced with this alternative, and queuing would not be a concern. This alternative provides excess vehicular capacity and is not recommended.

While good operations would be achieved, this alternative has the following constraints:

- Pedestrian and bicycle access can be accommodated, but it is a relatively large intersection for pedestrian crossings.
- SB left turns from Chestnut Street onto the Inner Loop will be restricted due to geometric constraints. Alternative access via Woodbury Blvd or S. Union will be available for this minor movement.

Intersection	LANE GROUP	AM Peak Hour					PM Peak Hour				
		V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
	EB-L (1)	0.47	17.5	B	83	151	0.42	26.5	C	41	77
	EB-T (1)	0.39	21.7	C	114	253	0.47	31.8	C	135	256
	EB-R (1)	0.22	4.4	A	0	46	0.14	0.5	A	0	0
Inner Loop/Howell Street & Chestnut Street/Monroe Avenue *Signalized*	WB-L (1)	0.05	5.6	A	3	6	0.07	11.1	B	6	11
	WB-TR (2)	0.32	13.3	B	70	97	0.71	27.9	C	227	271
	NB-L (1)	0.62	29.9	C	77	116	0.89	53.7	D	121	269
	NB-TR (1)	0.65	29.5	C	238	311	0.38	15.2	B	131	196
	SB-T (1)	0.73	44.8	D	185	258	0.93	53.7	D	357	565
	SB-R (1)	0.20	0.3	A	0	0	0.85	6.6	A	0	0
	Intersection	-	20.9	C	-	-	-	24.5	C	-	-

Alternative 1A: Traditional signalized intersection with reduced geometry on the EB approach consisting of an EB Left Turn lane and a Through-Right lane on the Inner Loop. This alternative provides LOS D or better, low v/c ratios, and queuing that does not affect adjacent intersections. This alternative reduces the number of lanes for pedestrians to cross from Monroe Avenue to Chestnut Street. SB left turns from Chestnut Street onto Howell Street will be prohibited due to geometric constraints.

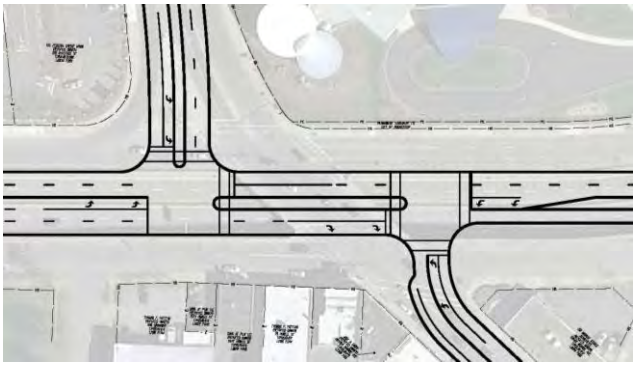
Reference: Inner Loop East – Intersection Alternatives – Capacity Analysis

ALTERNATIVE 1A: SIGNALIZED INTERSECTION - EB APPROACH: EB-L, EB-TR											
		AM Peak Hour					PM Peak Hour				
Intersection	LANE GROUP	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
	EB-L (1)	0.45	15.8	B	78	141	0.42	26.5	C	41	77
	EB-TR (1)	0.59	23.5	C	182	434	0.63	35.1	D	181	379
Inner Loop/Howell Street & Chestnut Street/Monroe Avenue *Signalized*	WB-L (1)	0.06	5.1	A	3	6	0.08	11.3	B	6	11
	WB-TR (2)	0.29	12.3	B	69	94	0.71	27.9	C	227	271
	NB-L (1)	0.70	38.0	D	80	124	0.89	53.7	D	121	269
	NB-TR (1)	0.69	32.6	C	247	330	0.38	15.2	B	131	196
	SB-T (1)	0.73	45.6	D	185	262	0.93	53.7	D	357	565
	SB-R (1)	0.20	0.3	A	0	0	0.85	6.6	A	0	0
	Intersection	-	23.6	C	-	-	-	25.6	C	-	-
Source: Synchro 8/SimTraffic											

Alternative 1B: Traditional signalized intersection with continued reduction in width including Alternative 1A geometry plus only one WB LTR travel lane on the Inner Loop. Reduction of WB lanes to one will force WB, NB Monroe Avenue and SB Chestnut approaches to operate at LOS F during the PM peak hour. These levels are not borderline failures, queuing is estimated on the WB Inner Loop approach to range from 600-800 feet which would affect operations at the Howell Street and S. Union Street intersection. This option is not recommended based on the capacity results.

ALTERNATIVE 1B: SIGNALIZED INTERSECTION - WB APPROACH: WB-LTR											
		AM Peak Hour					PM Peak Hour				
Intersection	LANE GROUP	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
	EB-L (1)	0.51	16.9	B	78	141	0.42	22.0	C	36	68
Inner Loop/Howell Street & Chestnut Street/Monroe Avenue *Signalized*	EB-TR (1)	0.54	17.1	B	182	311	0.47	20.9	C	157	239
	WB-LTR (1)	0.62	22.0	C	224	328	1.16	118.0	F	595	817
	NB-L (1)	0.70	38.0	D	80	124	1.07	100.0	F	145	308
	NB-TR (1)	0.69	32.6	C	247	330	0.43	19.8	B	153	230
	SB-T (1)	0.73	45.6	D	185	262	1.02	77.2	F	391	614
	SB-R (1)	0.20	0.3	A	0	0	0.85	6.6	A	0	0
	Intersection	-	24.0	C	-	-	-	48.8	D	-	-

Alternative 2: Traditional signalized off-set intersections with reduced east/west travel lanes on the Inner Loop. This alternative was developed to improve pedestrian crossings by separating and creating two off–set T-intersections. The capacity analysis indicates that the five lane section through both intersections would cause failing conditions during the weekday evening peak hour for critical movements at both T-intersections. The failing conditions are not borderline, significant delays and queuing would be experienced for Chestnut Street SB and Monroe Ave NB approaches.



Reference: Inner Loop East – Intersection Alternatives – Capacity Analysis

ALTERNATIVE 2: OFFSET INTERSECTIONS											
		AM Peak Hour					PM Peak Hour				
Intersection	LANE GROUP	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
Inner Loop/Howell Street & Chestnut Street *Signalized*	EB-L (1)	0.83	48.0	D	102	214	0.26	21.5	C	40	74
	EB-T (2)	0.81	47.0	D	145	222	0.61	42.9	D	118	168
	WB-TR (2)	0.58	4.6	A	60	69	0.97	55.1	E	128	94
	SB-L (1)	0.82	50.5	D	183	320	1.25	159.9	F	522	738
	SB-R (1)	0.20	0.3	A	0	0	1.82	394.6	F	1134	1394
	Intersection	-	23.8	C	-	-	-	191.6	F	-	-
Inner Loop/Howell Street & Monroe Avenue *Signalized*	EB-T (1)	0.52	13.0	B	65	111	0.43	10.3	B	46	90
	EB-R (1)	0.51	3.2	A	0	4	0.60	10.7	B	103	12
	WB-L (1)	0.08	19.6	B	9	25	0.06	23.3	C	8	20
	WB-T (2)	0.59	37.9	D	100	146	1.13	111.0	F	262	384
	NB-LR (2)	0.74	37.0	D	173	235	1.08	111.0	F	240	354
	Intersection	-	23.7	C	-	-	-	67.0	E	-	-
Source: Synchro 8/SimTraffic											

Alternative 2A: Traditional signalized off-set intersections with double left/right turn lanes on Monroe/Chestnut approaches. A free flow right turn lane for Chestnut Street SB approach is also included. This option was assessed in order to achieve improved intersection operations. This alternative would require a six lane section between the two off-set T-intersections and four travel lanes on Monroe Avenue. These geometric requirements would:

- Impact properties on the Monroe Avenue approach.
- Not improve or decrease the number of travel lanes for pedestrians to cross.

ALTERNATIVE 2A: OFFSET INTERSECTIONS WITH DUAL TURN LANES											
		AM Peak Hour					PM Peak Hour				
Intersection	LANE GROUP	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
Inner Loop/Howell Street & Chestnut Street *Signalized*	EB-L (1)	0.84	46.0	D	90	216	0.37	22.5	C	36	70
	EB-T (2)	0.60	33.3	C	132	184	0.45	31.4	C	98	142
	WB-TR (2)	0.49	2.6	A	56	51	0.72	5.8	A	47	74
	SB-L (2)	0.78	51.5	D	97	159	0.80	41.3	D	182	268
	SB-R (1)	0.20	0.3	A	0	0	0.85	6.7	A	0	0
	Intersection	-	20.0	B	-	-	-	15.2	B	-	-
Inner Loop/Howell Street & Monroe Avenue *Signalized*	EB-T (1)	0.58	8.9	A	20	62	0.41	5.4	A	21	44
	EB-R (2)	0.36	3.3	A	0	20	0.39	2.5	A	6	28
	WB-L (1)	0.07	15.7	B	8	22	0.07	18.1	B	8	24
	WB-T (2)	0.43	30.3	C	91	133	0.83	42.8	D	201	296
	NB-LR (2)	0.56	30.9	C	162	220	0.76	38.2	D	178	242
	Intersection	-	19.3	B	-	-	-	24.5	C	-	-
Source: Synchro 8/SimTraffic											

Alternative 3: Single Lane Roundabout – an oval roundabout to optimize the approach entries is shown to the right. Capacity analysis indicates a single lane roundabout would not provide

acceptable levels of service. Most approaches to the roundabout would operate at over capacity conditions with significant queuing in all directions. This alternative has the following constraints:

- Geometric footprint is large and the Monroe Avenue approach to the roundabout may not fit within the ROW.
- The distance travelled by a pedestrian would notably increase.
- Access to adjacent businesses would not be permitted within the RDB proper.
- Alternative access options to the parcels on the southwest corner would be required.

Intersection	LANE GROUP	AM Peak Hour				PM Peak Hour			
		Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
Inner Loop/Howell Street & Chestnut St/Monroe Ave *Roundabout*	EB-L	58.4	F	431	1208	89.9	F	1020	1275
	EB-T	62.2	F	431	1208	75.8	F	1020	1275
	EB-R	55.4	F	431	1208	68.8	F	1020	1275
	WB-L	90.0	F	917	1173	127.9	F	1408	1655
	WB-T	89.3	F	917	1173	88.8	F	1408	1655
	WB-R	85.0	F	917	1173	60.9	F	1408	1655
	NB-L	60.2	F	261	530	28.6	D	401	515
	NB-T	57.2	F	261	530	31.4	D	401	515
	NB-R	56.6	F	261	530	69.9	F	401	515
	SB-L	56.5	F	151	683	232.0	F	1047	1104
	SB-T	46.9	E	151	683	264.6	F	1047	1104
	SB-R	0.0	A	0	0	0.0	A	0	0
	Intersection	20.6	C	-	-	23.8	C	-	-

Source: VISSIM 5.4

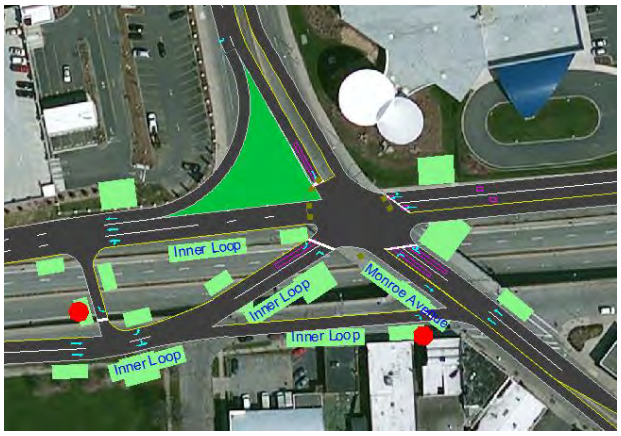
Alternative 3A: Dual Lane Roundabout - in order to address the capacity deficiencies identified in Alternative 3, a dual lane roundabout was assessed that may include two entry lanes on the WB Inner Loop approach and on the SB Chestnut Street approach along with a SB bypass lane for right turning vehicles. The capacity analysis indicates that a significant reduction in delay would be achieved. However, some queuing would still be anticipated, especially on the Monroe Avenue NB approach. While good operations would be achieved, this alternative has the following constraints:

Reference: Inner Loop East – Intersection Alternatives – Capacity Analysis

- Geometric footprint is large and the Monroe Avenue approach to the roundabout may not fit within the ROW.
- Pedestrian access would be a challenge.
- Access to adjacent businesses would not be permitted within the RDB proper. Alternative access options to the parcels on the southwest corner would be required.

Intersection	LANE GROUP	AM Peak Hour				PM Peak Hour			
		Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
	EB-L	5.8	A	1	98	6.0	A	2	120
	EB-T	4.6	A	1	98	5.0	A	2	120
	EB-R	3.7	A	1	98	4.5	A	2	120
	WB-L	17.6	C	10	169	16.4	C	31	340
Inner Loop/Howell Street & Chestnut St/Monroe Ave *Roundabout*	WB-T	14.4	B	10	169	15.0	B	31	340
	WB-R	17.4	C	10	169	17.3	C	31	340
	NB-L	39.2	E	132	513	18.2	C	38	420
	NB-T	39.2	E	132	513	18.2	C	38	420
	NB-R	36.6	E	132	513	14.1	B	38	420
	SB-L	8.1	A	2	82	41.9	E	61	372
	SB-T	6.7	A	2	82	30.4	D	61	372
	SB-R	0.0	A	0	0	0.0	A	0	0
	Intersection	15.2	C	-	-	13.5	B	-	-

Source: VISSIM 5.4



***Alternative 4A:* Signalized Intersection with U-Turn west of Broadway:** This option is a variation from the traditional four-way intersection, Alternative 1A. This option eliminates westbound left turns from the Howell Street approach at the intersection proper, has no southbound left turn lane on Chestnut Street. The U-turn just west of the intersection allows for the turn restrictions and improved access to Broadway and the adjacent residential neighborhood.

This option works well with a minimal amount of lanes, similar to Alternative 1A. However, a deceleration lane along westbound Inner Loop leading to the U-turn would be necessary to prevent rear-end accidents at the U-turn location. Geometric constraints with the eastbound Inner Loop ramp lanes were identified along with the concern that eastbound right turning traffic will act as free flow conditions and will impact pedestrian crossings. There is no net benefit of this option over Alternative 1A.

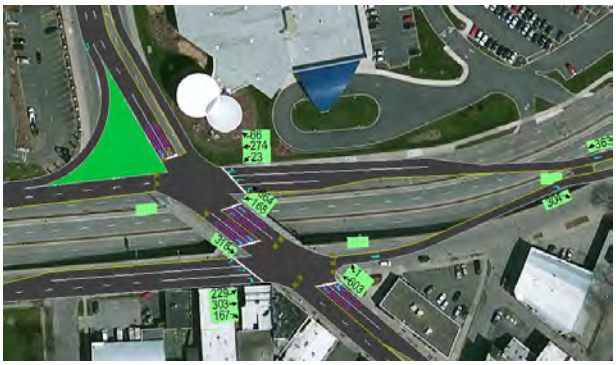
Reference: Inner Loop East – Intersection Alternatives – Capacity Analysis

ALTERNATIVE 4A: SIGNALIZED INTERSECTION with U-TURN											
		AM Peak Hour					PM Peak Hour				
Intersection	LANE GROUP	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
	EB-L (1)	0.28	14.8	B	82	144	0.16	22.8	C	44	81
	EB-T (1)	0.41	16.9	B	118	203	0.52	29.3	C	150	232
	EB-R (1)*	0.26	11.2	B	-	26	0.20	12.8	B	-	19
	WB-L (1)*	0.04	11.2	B	-	3	0.03	10.1	B	-	3
Inner Loop/Howell Street & Chestnut Street/Monroe Avenue *Signalized*	WB-TR (2)	0.34	29.8	C	73	123	0.81	46.9	D	198	355
	NB-L (1)	0.59	29.0	C	77	119	0.87	49.6	D	125	271
	NB-TR (1)	0.66	30.2	C	238	324	0.38	14.1	B	129	193
	SB-T (1)	0.74	46.3	D	185	266	0.93	53.2	D	368	580
	SB-R (1)	0.20	0.3	A	0	0	0.88	8.3	A	0	8
	Intersection	-		A	-	-	-	28.7	C	-	-

*Movements are unsignalized and offset from main intersection.

Alt 4B - Signalized Intersection with U-Turn at Broadway: This is a sub option of Alternative 4A to have the U-turn directly across from Broadway. This also works from a traffic standpoint and would produce similar capacity analysis results as alternative 4A. As stated in 4A, it should consider a deceleration lane along westbound Inner Loop leading to the U-turn. Geometric and pedestrian safety concerns would be similar to 4A and it would not produce any notable benefits over alternative 1A

Alt 5 - Signalized Intersections at Existing Ramps:
This option maintains the current ramps from the Inner Loop to Monroe Avenue and Chestnut Street. The area between the ramps would be filled in and converted to green space. This option works provided two SB thru lanes on Chestnut Street. This is needed to minimize green time for that movement and provide improved operations for the Monroe Avenue NB thru and left turns, as well as the Inner Loop ramp EB lefts. There is insufficient storage between the two intersections to hold the eastbound left-turn volume during the morning peak hour. Therefore, to phase the signal so that the northbound thru movement (at the intersection with WB Inner Loop) overlaps with the eastbound left-turn phase so that those left-turning vehicles can travel all the way through the intersection.



While operations can be refined to address the travel volumes, this option would require wider road widths, does not make the pedestrian crossing distances any shorter and eliminate potential development area east of Monroe/Chestnut St. The green space area would provide improved walking experience versus crossing on a bridge today.

Reference: Inner Loop East – Intersection Alternatives – Capacity Analysis

ALTERNATIVE 5: SIGNALIZED INTERSECTIONS at EXISTING RAMPS											
		AM Peak Hour					PM Peak Hour				
Intersection	LANE GROUP	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
Inner Loop/Howell Street EB & Chestnut Street/Monroe Avenue *Signalized*	**EB-L (1)**	0.35	22.0	C	104	144	0.15	20.8	C	41	76
	EB-T (1)	0.44	23.4	C	144	203	0.41	24.6	C	133	205
	EB-R (1)	0.25	3.8	A	0	26	0.13	4.1	A	0	26
	NB-TR (2)	0.37	16.4	B	127	40	0.35	14.4	B	120	159
	SB-T (2)	0.37	7.0	A	12	123	0.65	6.5	A	16	20
	Intersection	-	15.3	B	-	-	-	13.1	B	-	-
Inner Loop/Howell Street WB & Chestnut Street/Monroe Avenue *Signalized*	**WB-L (1)**	0.07	46.8	D	15	30	0.06	40.9	D	15	30
	WB-TR (2)	0.50	48.3	D	113	170	0.81	54.4	D	242	308
	NB-L (1)	0.23	3.5	A	9	22	0.41	4.5	A	7	12
	NB-T (1)	0.55	5.7	A	72	383	0.39	2.9	A	17	34
	SB-T (2)	0.35	31.8	C	86	125	0.59	33.6	C	172	229
	SB-R (1)	0.20	0.3	A	0	0	0.85	6.6	A	0	0
	Intersection	-	17.6	B	-	-	-	20.7	C	-	-

Alt 6 - Inner Loop T at Monroe/Chestnut: This option ends the Inner Loop ramps at Monroe Avenue as a T-Intersection. This option is similar to a concept provided in a prior charette plan. This option would force current traffic to find alternative ways to their destination within the project area. For example, traffic could divert north and use the Broad/Court Street connection to South Union corridor, or traffic could turn right and then left at the S. Union/Monroe Avenue intersection. For analysis purposes, it was assumed that traffic would split 50/50 at the T intersection. 50% of the vehicles traveling thru on Inner Loop/Howell Street would reroute via Broad Street, and the other 50% would utilize S Union to Monroe Ave. Analysis indicates that to accommodate the rerouted traffic, the following geometry would be necessary at the intersection: a double left-turn lane from Monroe to the westbound Inner Loop; a separate right-turn lane on southbound S. Union Street.

This option essentially offsets major thru movements. There is too much uncertainty when it comes to how vehicles would redistribute; if more vehicles redistribute to S Union Street, then more improvements may be needed at that location. Improvements would entail widening which would impact adjacent properties. This option may be made to work, however would shift traffic to other locations and would require additional improvements and widening to accommodate.

Reference: Inner Loop East – Intersection Alternatives – Capacity Analysis

ALTERNATIVE 6: INNER LOOP T INTERSECTION											
		AM Peak Hour					PM Peak Hour				
Intersection	LANE GROUP	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
Inner Loop & Chestnut Street/Monroe Avenue *Signalized*	**EB-L (1)**	0.78	41.7	D	230	311	0.69	46.6	D	145	213
	EB-R (1)	0.48	5.0	A	0	54	0.46	7.4	A	0	58
	NB-L (2)	0.64	45.8	D	99	147	0.79	41.1	D	170	281
	NB-T (1)	0.41	13.3	B	150	260	0.27	7.0	A	59	126
	SB-T (1)	0.42	26.1	C	147	246	0.73	31.3	C	326	515
	SB-R (1)	0.29	0.5	A	0	0	1.07	48.4	F	144	406
	Intersection	-	20.9	C	-	-	-	37.8	D	-	-
Monroe Avenue & South Union Street *Signalized*	**EB-L (1)**	0.59	21.2	C	62	139	0.39	5.7	A	11	13
	EB-T (1)	0.48	13.4	B	131	205	0.62	8.4	A	49	50
	WB-T (1)	0.55	14.4	B	163	251	0.50	13.6	B	186	270
	WB-R (1)	0.18	2.6	A	3	29	0.20	2.8	A	9	38
	NB-L (1)	0.16	17.9	B	31	63	0.19	24.8	C	47	88
	NB-T (1)	0.54	23.6	C	139	221	0.33	26.8	C	98	159
	NB-R (1)	0.04	6.8	A	0	16	0.07	7.8	A	0	23
	SB-L (1)	0.48	27.0	C	46	100	0.56	30.9	C	103	155
	SB-R (1)	0.22	4.1	A	0	35	0.45	3.9	A	28	37
	Intersection	-	15.6	B	-	-	-	12.3	B	-	-

Alt 7 – Inner Loop/Howell Street Offset: another option is to create off-set T-Intersections with Monroe Avenue/Chestnut as shown to the right. This option would require adding dual left-turn lanes northbound on Monroe Avenue, as well as dual right-turn lanes westbound on the Howell Street approach. As shown in the capacity analysis summary table, the NB left-turns on Monroe Avenue would operate at LOS F in the PM peak hour. The left-turn volume during the PM peak hour is approximately 900 vehicles. Therefore, a triple left would be required. It does not make sense to needlessly require, what were simple through

movements on EB/WB Inner Loop/Howell Street, to make multiple turning movements to complete the thru move.

ALTERNATIVE 7: INNER LOOP - HOWELL STREET OFFSET											
		AM Peak Hour					PM Peak Hour				
Intersection	LANE GROUP	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
Inner Loop EB & Chestnut Street/Monroe Avenue *Signalized*	**EB-L (1)**	0.48	32.1	C	126	201	0.25	33.8	C	52	98
	EB-R (1)	0.62	6.7	A	0	80	0.58	7.5	A	0	76
	NB-L (2)	0.48	20.9	C	107	142	0.94	96.4	F	301	434
	NB-T (1)	0.47	12.8	B	256	370	0.30	7.4	A	57	122
	SB-T (1)	0.61	39.1	D	174	266	0.93	54.8	D	363	577
	SB-R (1)	0.47	6.0	A	0	63	0.85	6.6	A	0	0
	Intersection	-	17.7	B	-	-	-	37.9	D	-	-
Howell Street WB & Chestnut Street/Monroe Avenue *Signalized*	**WB-L (1)**	0.05	24.0	C	7	15	0.03	16.9	B	5	16
	WB-R (2)	0.23	1.1	A	2	0	0.39	3.7	A	23	49
	NB-TR (2)	0.53	28.3	C	170	225	0.65	35.2	D	190	252
	SB-T (1)	0.54	16.3	B	145	187	0.70	33.7	C	90	142
	SB-R (1)	0.42	19.0	B	236	311	0.74	12.1	B	96	144
	Intersection	-	18.3	B	-	-	-	18.7	B	-	-

Inner Loop/Howell/S. Union Street Intersection

Four intersection alternatives were considered and evaluated at this intersection. These include a traditional T-intersection and a roundabout. Variations for each alternative were evaluated.

Alternative 1: Traditional T-intersection with the Inner Loop/Howell Street terminating and forming a T-intersection with S. Union Street. A three lane section would be necessary on S. Union Street. A southbound right turn lane and a northbound left turn lane on Union would be necessary. Capacity analysis indicates the overall intersection would operate at acceptable levels of service as a "stop" sign controlled intersection, with the exception of the Howell Street approach, which would experience delays considered border line "failing" (51.3 sec) during the evening peak hour. A traffic signal could be considered at this location when and if traffic volumes and delays materialize. A traffic signal would provide acceptable levels of service on all three approaches.

ALTERNATIVE 1: HOWELL STREET "T" AT UNION STREET											
		AM Peak Hour					PM Peak Hour				
Intersection	LANE GROUP	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
Howell Street & S Union Street *Unsignalized*	**EB-LR (1)**	0.81	41.1	E	-	181	0.89	51.3	F	-	236
	NB-LT (1)	0.01	0.2	A	-	0	0.01	0.2	A	-	1
	SB-T (1)	0.06	0.0	A	-	0	0.10	0.0	A	-	0
	SB-R (1)	0.22	0.0	A	-	0	0.38	0.0	A	-	0
	Intersection	-	9.8	A	-	-	-	6.1	A	-	-

v/c ratio = volume/capacity ratio
Source: Synchro 8/SimTraffic

Reference: Inner Loop East – Intersection Alternatives – Capacity Analysis

Alternative 2: Traditional 4-way intersection of Howell Street terminating at S. Union Street opposite LaFayette Street. As a four-way intersection, traffic signal control would be necessary. One travel lane in all four approaches to serve shared access by lefts, troughs and right turning vehicles would be sufficient. This geometry will also maintain a tight intersection allowing for improved pedestrian crossing. The capacity analysis indicates acceptable levels (LOS D or better) with low v/c ratios and moderate queuing.

ALTERNATIVE 2: FOUR-LEG INTERSECTION AT LAFAYETTE STREET											
		AM Peak Hour					PM Peak Hour				
Intersection	LANE GROUP	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
Howell Street/Lafayette Street & S Union Street *Signalized*	**EB-LTR (1)**	0.76	34.5	C	145	211	0.85	42.6	D	167	315
	WB-LTR (1)	0.01	12.8	B	1	8	0.01	14.2	B	1	9
	NB-LTR (1)	0.58	21.3	C	250	217	0.48	14.0	B	192	301
	SB-LTR (1)	0.46	6.0	A	41	125	0.76	14.1	B	181	352
	Intersection	-	19.1	B	-	-	-	20.6	C	-	-
v/c ratio = volume/capacity ratio											
Source: Synchro 8/SimTraffic											

A sub option was considered with this four-way alignment to provide stop sign control on all four approaches. This option would require additional travel lanes on the Howell Street approach and the S. Union Street southbound approach would need to be widened to provide a free-flow right turn lane. Hence, an all-way stop sign control intersection would not work without additional widening.

Alternative 3: Traditional T-intersection with the Inner Loop/Howell Street proceeding in a north/south direction with the S. Union Street segment from Monroe Avenue terminating at a T-intersection with the Inner Loop. A three lane section on the Inner Loop/new Union Street would be necessary. The S. Union stub would be controlled by a stop sign. Capacity analysis indicates acceptable levels of operation (LOS D or better). Little to no delay would be experienced by all movements.

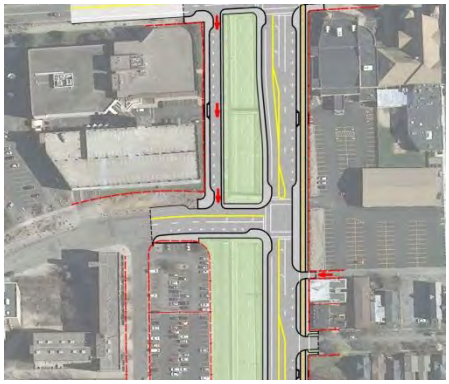
This alternative would continue the free flow traffic operations that would promote higher travel speeds. This alternative does not provide a definitive terminus of the Inner Loop.

Reference: Inner Loop East – Intersection Alternatives – Capacity Analysis

ALTERNATIVE 3: UNION STREET "T" AT HOWELL STREET											
		AM Peak Hour					PM Peak Hour				
Intersection	LANE GROUP	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
Howell Street & S Union Street *Unsignalized*	WB-LR (1)	0.79	24.9	C	-	199	0.66	19.5	C	-	126
	NB-TR (1)	0.20	0.0	A	-	0	0.22	0.0	A	-	0
	SB-L (1)	0.08	8.2	A	-	7	0.14	8.5	A	-	12
	SB-T (1)	0.22	0.0	A	-	0	0.37	0.0	A	-	0
	Intersection	-	11.1	B	-	-	-	6.4	A	-	-
v/c ratio = volume/capacity ratio											
Source: Synchro 8/SimTraffic											

Alternative 4: Single Lane Roundabout – a single lane roundabout would have the Inner Loop approach T-into S. Union Street. This was the initial concept layout presented in the 2009 project scoping report as a gateway treatment into the corridor. Preliminary analysis using Synchro which provides a planning level overall assessment indicates the roundabout would operate with indicates a roundabout would operate with a volume to capacity ratio of (V/C) in the AM of 0.55 and in the PM of 0.59, well under capacity conditions. However, this option has significant impacts in the general areas and was dropped from serious consideration as follow:

- A single lane roundabout at this location would have significant right-of-way needs. The roundabout sketch created (shown) still does not accommodate truck traffic on Howell wishing to turn right onto South Union Street. Truck traffic would have to go around the entire roundabout perimeter to proceed in a southerly direction.
- Significant impacts would be experienced by adjacent private driveways. Access to residential and commercial driveways would need to be reconnected further from the approaches to the roundabout.
- The placement of such a large roundabout at this location would eliminate existing parking spaces along Union and Howell and prohibit the creation of additional spaces as compared to other alternatives. This area has intense number of multi-family residential housing that depends on on-street parking. Alternative off-street parking would need to be created within the vicinity.
- The extent a pedestrian or bicycle would have to travel to cross the intersection to reach the cycle track on the west side of the corridor is significantly longer than a traditional intersection.
- The extent of the intersection footprint would notably minimize developable land in this prime entrance to the new corridor.
- This alternative would not consistent with the desire to establish an urban city street by minimizing the intersection footprint which notably improves walkability and mobility.



Broad Street/Union Street Intersection

Two major intersection alternatives were considered and evaluated at this intersection. These include a traditional T-

intersection and a roundabout. Variations for each alternative were evaluated.

Alternative 1: Traditional signalized T-intersection – Broad Street would have two approach lanes and Union Street would have a three lane section. The capacity analysis indicates acceptable levels of service (LOS D or better) would be experienced. Queuing is not anticipated to affect major intersections, but may block side streets and alleys.

ALTERNATIVE 1: SIGNALIZED

Intersection	LANE GROUP	AM Peak Hour V/C Ratio	AM Delay	AM Level of Service	AM 50th Queue (ft)	AM 95th Queue (ft)	PM Peak Hour V/C Ratio	PM Delay	PM Level of Service	PM 50th Queue (ft)	PM 95th Queue (ft)
S Union St & E Broad St *Signalized*	EB-L (1)	0.40	45.0	D	54	99	0.77	47.4	D	198	271
	EB-R (1)	0.17	13.7	B	0	29	0.35	6.2	A	0	43
	NB-L (1)	0.34	3.7	A	14	29	0.19	5.6	A	11	22
	NB-T (1)	0.48	4.2	A	117	209	0.63	11.2	B	347	490
	SB-TR (1)	0.57	9.2	A	152	193	0.65	13.6	B	143	174
	Intersection	-	8.5	A	-	-	-	17.3	B	-	-

v/c ratio = volume/capacity ratio
Source: Synchro 8/SimTraffic

Alternative 2: Single Lane Roundabout – a single lane roundabout would operate and provide good levels of service, if in isolation. However, if a roundabout is considered at the East Avenue intersection, failing levels of service would be experienced, due to the proximity of the two intersections.

ALTERNATIVE 2: SINGLE LANE ROUNDABOUT WITH SINGLE LANE ROUNDABOUTS ALONG CORRIDOR*

Intersection	MOVEMENT	AM Peak Hour Delay	AM Level of Service	AM 50th Queue (ft)	AM 95th Queue (ft)	PM Peak Hour Delay	PM Level of Service	PM 50th Queue (ft)	PM 95th Queue (ft)
S Union St & E Broad St *Roundabout*	EB-L	22.7	C	9	111	126.9	F	241	281
	EB-R	4.6	A	9	111	90.6	F	241	281
	NB-L	85.5	F	1317	1667	320.6	F	1521	1661
	NB-T	87.9	F	1317	1667	308.9	F	1521	1661
	SB-T	5.9	A	46	650	15.6	C	438	696
	SB-R	6.9	A	46	650	5.5	A	438	696
	Intersection	46.8	E	-	-	131.8	F	-	-

Source: VISSIM 5.4
*Failing movements are due to queue spillback from East Avenue intersection.

If a dual lane roundabout is considered at East Avenue, the Broad Street dual lane roundabout would show improved operations, see table below. All movements would operate at LOS D or better, except the Broad Street left turn movement which would experience LOS F during the evening peak hour. However, it should be noted that the failing condition is borderline levels with high volumes projected out to 2035.

Reference: Inner Loop East – Intersection Alternatives – Capacity Analysis

ALTERNATIVE 2A: SINGLE LANE ROUNDABOUT WITH DUAL LANE ROUNDABOUTS AT EAST AVE AND MONROE AVE									
		AM Peak Hour				PM Peak Hour			
Intersection	MOVEMENT	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
S Union St & E Broad St *Roundabout*	EB-L	4.5	A	1	50	52.4	F	104	277
	EB-R	4.7	A	1	50	39.4	E	104	277
	NB-L	4.7	A	1	53	30.4	D	87	885
	NB-T	3.3	A	1	53	31.3	D	87	885
	SB-T	7.8	A	7	267	6.5	A	2	119
	SB-R	7.9	A	7	267	4.5	A	2	119
	Intersection	5.4	A	-	-	27.3	D	-	-
Source: VISSIM 5.4									

East Avenue/Union Street Intersection

Two major intersection alternatives were considered and evaluated at the East Avenue intersection. These include a traditional signalized intersection and a roundabout. Variations for each alternative were evaluated.

Alternative 1: Traditional signalized intersection – East Avenue would continue to operate as it does today with a three lane section; this would be restriped to include dedicated left turn lanes and one through lane in each direction. The capacity analysis indicates acceptable overall levels of service would be experienced with failing movements on the Union Street NB approach. Queuing is shown to be long on both approaches. The Union NB approach queue of 300-435 feet would exceed available storage and interfere with the Broad Street intersection.

ALTERNATIVE 1: DEDICATED LEFT-TURN LANES (3-LANES ON EAST AVE)											
		AM Peak Hour					PM Peak Hour				
Intersection	LANE GROUP	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
S Union St & East Ave *Signalized*	EB-L (1)	0.09	16.1	B	10	25	0.14	14.0	B	14	49
	EB-TR (1)	0.48	32.2	C	116	181	0.96	59.7	E	333	556
	WB-L (1)	0.42	33.8	C	89	146	0.39	18.1	B	31	59
	WB-TR (1)	0.73	44.2	D	277	376	0.74	34.5	C	252	424
	NB-L (1)	0.39	26.2	C	66	116	0.20	16.7	B	18	40
	NB-TR (2)	0.53	38.2	D	204	257	1.00	59.5	F	294	435
	SB-L (1)	0.55	22.3	C	88	137	0.88	52.6	D	94	245
	SB-TR (1)	0.71	38.6	D	287	431	0.77	39.8	D	254	436
	Intersection	-	36.1	D	-	-	-	49.0	D	-	-
v/c ratio = volume/capacity ratio											
Source: Synchro 8/SimTraffic											

An option to be considered would be to maintain the 3-lane section on East Avenue as it is working today and adjust the intersection operations in future years as development occurs in the area.

Reference: Inner Loop East – Intersection Alternatives – Capacity Analysis

Alternative 1A: Traditional signalized intersection – East Avenue would continue to operate as it does today, but with a four lane section. The four lane section is primarily needed during the weekday evening peak hour. A four lane pavement section is currently on East Avenue, with the outer lanes used for on-street parking. Restricting parking on the south side of East Avenue between Union and Alexander could be considered during the evening peak hour. Intersection markings and signing would need to be further evaluated. The capacity analysis does indicate improved intersection operations and reduced queues that maybe less likely to overflow into other intersections.

ALTERNATIVE 1A: FOUR-LANES ON EAST AVENUE

Intersection	LANE GROUP	AM Peak Hour V/C Ratio	AM Delay	AM Level of Service	AM 50th Queue (ft)	AM 95th Queue (ft)	PM Peak Hour V/C Ratio	PM Delay	PM Level of Service	PM 50th Queue (ft)	PM 95th Queue (ft)
S Union St & East Ave *Signalized*	EB-LTR (2)	0.31	24.3	C	61	90	0.70	33.6	C	180	228
	WB-LTR (2)	0.81	28.1	C	207	221	0.86	30.7	C	77	139
	NB-L (1)	0.29	8.7	A	19	32	0.12	8.2	A	13	19
	NB-TR (2)	0.44	19.0	B	170	238	0.72	24.1	C	136	193
	SB-L (1)	0.44	11.4	B	44	81	0.70	22.9	C	51	149
	SB-TR (1)	0.57	21.5	C	229	355	0.53	21.1	C	228	359
	Intersection	-	21.4	C	-	-	-	26.5	C	-	-

v/c ratio = volume/capacity ratio
Source: Synchro 8/SimTraffic

Alternative 2: Single Lane Roundabout – a single lane roundabout at the East Avenue intersection was considered. The capacity analysis indicates this intersection treatment would not provide the needed capacity for the projected volumes at this location. Failing levels would be experienced on most approaches with extensive queuing in all directions. This queuing would affect operations on all nearby intersections, potentially causing gridlock conditions.

Intersection	LANE GROUP	AM Peak Hour Delay	AM Level of Service	AM 50th Queue (ft)	AM 95th Queue (ft)	PM Peak Hour Delay	PM Level of Service	PM 50th Queue (ft)	PM 95th Queue (ft)
S Union St & East Ave *Roundabout*	EB-L	41.1	E	85	474	134.9	F	455	496
	EB-T	45.5	E	85	474	131.5	F	455	496
	EB-R	41.7	E	85	474	122.6	F	455	496
	WB-L	113.7	F	667	829	41.9	E	551	801
	WB-T	113.0	F	667	829	39.0	E	551	801
	WB-R	112.9	F	667	829	38.0	E	551	801
	NB-L	47.0	E	292	615	70.2	F	706	840
	NB-T	44.8	E	292	615	62.2	F	706	840
	NB-R	44.3	E	292	615	62.9	F	706	840
	SB-L	63.8	F	462	781	58.0	F	622	806
	SB-T	63.7	F	462	781	61.5	F	622	806
	SB-R	58.6	F	462	781	56.4	F	622	806
	Intersection	68.1	F	-	-	67.8	F	-	-

Source: VISSIM 5.4

Reference: Inner Loop East – Intersection Alternatives – Capacity Analysis

Alternative 2A: Dual Lane Roundabout – a dual lane roundabout at the East Avenue intersection was considered in order to determine the infrastructure needed to apply a roundabout at this intersection that would result in acceptable levels of service. The capacity analysis indicates this intersection treatment would provide notably improved operations; with the exception of the Union Street NB left turn movement onto East Avenue, which would still experience a LOS F. However, queuing would be reduced and the 800' queues NB would interfered with Broad Street requiring a dual lane at Broad.

While improved operations would be achieved with a dual lane roundabout at the East Avenue intersection, the following constraints are identified:

- The geometric footprint of the roundabout is very large. The approaches to the roundabout with provision of splitter islands would force the RDB to be placed in the center of the available developable lands in this area.
- Notable loss of developable lands would result.
- The distance traveled by pedestrian and bicycles would be notably longer.
- Reconnecting access to the immediate parcels would be challenging.

Intersection	LANE GROUP	AM Peak Hour				PM Peak Hour			
		Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
	EB-L	8.3	A	1	37	12.4	B	3	129
	EB-T	6.4	A	1	37	9.6	A	3	129
	EB-R	2.6	A	1	37	5.4	A	3	129
	WB-L	11.1	B	4	152	12.5	B	7	249
S Union St & East Ave *Roundabout*	WB-T	8.9	A	4	152	10.8	B	7	249
	WB-R	7.3	A	4	152	9.2	A	7	249
	NB-L	7.6	A	3	106	52.5	F	262	805
	NB-T	6.2	A	3	106	46.7	E	262	805
	NB-R	5.4	A	3	106	41.3	E	262	805
	SB-L	12.0	B	5	131	8.4	A	2	79
	SB-T	8.3	A	5	131	5.6	A	2	79
	SB-R	3.8	A	5	131	2.8	A	2	79
	Intersection	8.0	A	-	-		A	-	-

Source: VISSIM 5.4

Reference: Inner Loop East – Intersection Alternatives – Capacity Analysis

Charlotte Street/Union Street Intersection

Two major intersection alternatives were considered and evaluated at the Charlotte Street intersection. These include a traditional unsignalized, signalized intersection and a roundabout.

Alternative 1: Traditional unsignalized intersection – two-way stop sign control on the Charlotte Street approaches would result in failing levels of service during the weekday evening peak hour on the Charlotte Street approaches. This alternative would have one lane in each direction on Charlotte Street and a three-lane section on Union Street. This operation would also have safety concerns with southbound traffic on the Inner Loop ramp speeding through the intersection.

ALTERNATIVE 1: UNSIGNALIZED											
		AM Peak Hour					PM Peak Hour				
Intersection	LANE GROUP	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
	EB-LTR (1)	0.78	43.8	E	-	161	2.10	585.7	F	-	517
	WB-LTR (1)	0.46	46.9	E	-	53	2.65	959.8	F	-	293
S Union St & Charlotte St *Unsignalized*	NB-L (1)	0.03	8.4	A	-	2	0.04	8.5	A	-	3
	NB-TR (1)	0.38	0.0	A	-	0	0.54	0.0	A	-	0
	SB-L (1)	0.02	9.1	A	-	1	0.04	10.9	B	-	3
	SB-TR (1)	0.27	0.0	A	-	0	0.29	0.0	A	-	0
	Intersection	-	10.4	B	-	-	-	134.9	F	-	-

v/c ratio = volume/capacity ratio
Source: Synchro 8/SimTraffic

Alternative 1A: Traditional signalized intersection – This operation would provide acceptable levels of service for all approaches with minimal queuing. It should be noted that a traffic signal may rest predominantly on the north/south approaches due to the heavy volumes. This may be a safety concern with SB traffic coming off the Inner Loop ramp not slowing down through the intersection. Additional alternatives may need to be considered to address the pedestrian and bicycle conflicts at this location.

ALTERNATIVE 1A: SIGNALIZED											
		AM Peak Hour					PM Peak Hour				
Intersection	LANE GROUP	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
	EB-LTR (1)	0.54	14.2	B	37	115	0.51	16.9	B	46	122
	WB-LTR (1)	0.20	27.0	C	28	66	0.30	27.2	C	42	91
S Union St & Charlotte St *Signalized*	NB-L (1)	0.05	2.5	A	3	6	0.09	7.8	A	8	19
	NB-TR (2)	0.27	2.9	A	35	40	0.37	7.6	A	88	177
	SB-L (1)	0.03	5.0	A	3	10	0.07	5.5	A	4	13
	SB-TR (1)	0.36	7.1	A	105	154	0.38	7.3	A	114	166
	Intersection	-	7.4	A	-	-	-	9.9	A	-	-

v/c ratio = volume/capacity ratio
Source: Synchro 8/SimTraffic

Alternative 2: Single Lane Roundabout – a single lane roundabout at Charlotte Street would work well in isolation. As previously mentioned, intersection operations at East Avenue will affect Charlotte Street. The levels of service shown below assume a dual lane roundabout is provided at East Avenue

intersection. Capacity analysis indicates this intersection treatment would provide acceptable levels of service, with the exception of the EB approach which would experience a LOS E during the weekday evening peak hour.

ALTERNATIVE 2: SINGLE LANE ROUNDABOUT WITH DUAL LANE ROUNDABOUTS AT EAST AVENUE AVENUE									
		AM Peak Hour				PM Peak Hour			
Intersection	MOVEMENT	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
	EB-L	0.0	A	3	90	8.7	A	4	134
	EB-T	4.5	A	3	90	0.0	A	4	134
	EB-R	7.2	A	3	90	7.9	A	4	134
	WB-L	7.4	A	1	32	35.8	E	5	91
	WB-T	5.6	A	1	32	0.0	A	5	91
S Union St & Charlotte St *Roundabout*	WB-R	5.6	A	1	32	35.3	E	5	91
	NB-L	5.1	A	1	80	0.0	A	5	328
	NB-T	4.7	A	1	80	11.6	B	5	328
	NB-R	4.4	A	1	80	0.0	A	5	328
	SB-L	0.0	A	1	141	0.0	A	1	81
	SB-T	0.0	A	1	141	5.4	A	1	81
	SB-R	5.4	A	1	141	0.0	A	1	81
	Intersection	5.4	A	-	-	25.9	D	-	-
Source: VISSIM 5.4									

Inner Loop Ramps/Union Street Intersection

Other alternatives are being considered and evaluated for the Inner Loop Ramps/Union Street intersection. These include a T-Intersection opposite Richmond Street with variations that will include one-way and two way ramp options. This alternative would allow Union Street to provide two-way traffic up to University Avenue. As this alternative would re-distribute traffic in this area, the evening peak period was analyzed as it represents the worst peak hour.

Alternative 1: Inner Loop one-way northbound ramp only with Union Street two–way operations. This option would force Inner Loop exiting traffic to exit at the current E. Main Street exit then proceed south through the University Avenue intersection. Due to the close proximity and synchronized signal operations at the Union/University/E. Main Street intersection, this option affects all three intersections. Analysis indicates that adding approximately 465vph (evening peak) through the E. Main Street intersection will increase delays and queuing. The analysis shown includes optimization of the geometry and signal timing between the three intersections. The analysis also includes further redistribution of traffic to reflect this alternative. This includes converting Union Street to two-way all the way to E. Main Street further enhancing access to and from the public market area. The capacity analysis results would suggest:

- Inner Loop Ramp @ E. Main/University - an additional southbound lane would be necessary to address the queuing on the ramp.
- Union @ E. Main Street – the intersection will operate at acceptable levels with the introduction of southbound traffic. Queuing is not anticipated to overflow into adjacent intersections.

Reference: Inner Loop East – Intersection Alternatives – Capacity Analysis

- Union @ University – the addition of southbound traffic and additional phasing would still provide for acceptable levels of operation. Northbound queues may overflow into the Richmond Street intersection.
- Richmond/Union @ IL On-Ramp – This intersection would have to be signalized and provide a three lane section on Union Street. Overall acceptable levels of service would be achieved. However, long queues (400 feet) may result in the NB left turn lane onto the Inner Loop on-ramp.

ALTERNATIVE 1: ONE-WAY RAMP

Intersection	LANE GROUP	AM Peak Hour					PM Peak Hour				
		V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
S Union Street & Richmond Street *Signalized*	**WB-LTR (1)**			A			0.15	31.8	C	13	42
	NB-L (1)			A			0.74	18.7	B	88	414
	NB-TR (1)			A			0.33	1.6	A	43	43
	SB-T (1)			A			0.40	2.2	A	80	105
	Intersection	-		A	-	-	-	7.2	A	-	-
S Union Street & University Avenue *Signalized*	**EB-T (1)**			A			0.60	7.1	A	60	79
	EB-R (1)			A			0.47	2.0	A	1	2
	WB-L (1)			A			0.10	11.6	B	8	22
	WB-TR (1)			A			0.52	16.0	B	199	290
	NB-L (1)			A			0.10	25.1	C	27	59
	NB-T (1)			A			0.51	38.4	D	198	277
	NB-R (1)			A			0.23	12.8	B	40	93
	SB-LTR (1)			A			0.16	47.6	D	76	132
	Intersection	-		A	-	-	-	15.2	B	-	-
S Union Street & Main Street *Signalized*	**EB-L (1)**			A			0.01	16.8	B	3	5
	EB-TR (3)			A			0.67	25.5	C	135	170
	WB-L (1)			A			0.19	24.2	C	47	88
	WB-TR (3)			A			0.67	29.5	C	214	264
	NB-LT (1)			A			0.46	64.2	E	91	153
	NB-R (1)			A			0.54	36.8	D	105	187
	SB-LTR (1)			A			0.32	10.7	B	0	44
	Intersection	-		A	-	-	-	29.3	C	-	-
Main Street & University Avenue *Signalized*	**EB-L (1)**			A			0.26	23.9	C	6	12
	EB-TR (3)			A			0.50	16.0	B	62	77
	WB-TR (3)			A			0.64	2.4	A	1	1
	NB-L (1)			A			0.67	42.8	D	114	209
	NB-TR (2)			A			0.66	35.1	D	121	173
	SB-L (1)			A			0.87	48.8	D	262	271
	SB-TR (2)			A			0.79	96.4	F	933	1797
	Intersection	-		A	-	-	-	24.0	C	-	-
Main Street & University Avenue/Pitkin Street *Signalized*	**EB-L (1)**			A			0.07	22.5	C	7	23
	EB-TR (2)			A			0.53	27.5	C	162	217
	WB-T (2)			A			0.27	5.3	A	22	47
	WB-R (1)			A			0.25	1.3	A	0	9
	SB-L (2)			A			0.21	23.8	C	59	89
	SB-TR (1)			A			0.05	20.7	C	12	33
	Intersection	-		A	-	-	-	16.3	B	-	-

Alternative 2: this alternative would terminate the Inner Loop (two-way ramps) opposite Richmond Street with two way operations on Union Street. This alternative would eliminate the need for

westbound traffic on E. Main Street to use the Pitkin Street intersection. This alternative provides for left turns to occur at the E. Main Street/University Avenue intersection.

- Richmond/Union @ IL On-Ramp – This intersection is shown with traffic signal control. Considering, Richmond is a through street; it is recommended a signal be considered at this location. Overall acceptable levels of service would be achieved.
- Union/University – the additional signal phases would impact the EB approach. The EB approach will drop in level of service with queuing to exceed capacity and may impact operations at the E. Main Street intersections during peak hours.

ALTERNATIVE 2: TWO-WAY RAMP WITH LEFT AT UNIVERSITY AVE

		AM Peak Hour					PM Peak Hour				
Intersection	LANE GROUP	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
S Union Street & Richmond Street *Signalized*	**EB-R (1)**			A			0.62	5.2	A	0	47
	WB-LTR (1)			A			0.18	33.4	C	13	42
	NB-L (1)			A			0.43	1.9	A	7	18
	NB-TR (1)			A			0.33	1.0	A	8	17
	SB-TR (1)			A			0.11	2.3	A	11	21
	Intersection	-		A	-	-	-	3.2	A	-	-
S Union Street & University Avenue *Signalized*	**EB-LT (1)**			A			0.60	43.9	D	410	543
	EB-R (1)			A			0.12	3.4	A	6	18
	WB-L (1)			A			0.09	11.1	B	8	22
	WB-TR (1)			A			0.51	15.2	B	194	282
	NB-L (1)			A			0.08	19.7	B	24	42
	NB-T (1)			A			0.52	30.0	C	175	197
	NB-R (1)			A			0.24	10.8	B	41	64
	Intersection	-		A	-	-	-	26.7	C	-	-
S Union Street & Main Street *Signalized*	**EB-L (1)**			A			0.02	16.3	B	2	5
	EB-TR (2)			A			0.99	55.0	D	368	511
	WB-TR (3)			A			0.76	32.6	C	247	302
	NB-LT (1)			A			0.30	52.0	D	90	150
	NB-R (1)			A			0.43	30.5	C	91	167
	SB-LTR (1)			A			0.23	7.7	A	0	39
	Intersection	-		A	-	-	-	41.3	D	-	-
Main Street & University Avenue *Signalized*	**EB-L (1)**			A			0.27	25.3	C	6	12
	EB-TR (3)			A			0.52	17.1	B	64	79
	WB-L (1)			A			0.74	34.7	C	7	16
	WB-TR (3)			A			0.66	3.2	A	1	17
	NB-L (1)			A			0.45	27.0	C	103	174
	NB-TR (2)			A			0.44	24.4	C	110	157
	SB-L (1)			A			0.71	50.7	D	184	294
	SB-TR (2)			A			0.71	40.3	D	190	256
	Intersection	-		A	-	-	-	21.4	C	-	-
Main Street & University Avenue/Pitkin Street *Signalized*	**EB-L (1)**			A			0.07	23.1	C	7	23
	EB-TR (2)			A			0.54	28.5	C	165	221
	WB-T (2)			A			0.24	5.3	A	28	50
	WB-R (1)			A			0.22	1.6	A	0	8
	SB-L (2)			A			0.27	29.4	C	64	100
	SB-TR (1)			A			0.06	25.4	C	14	37
	Intersection	-		A	-	-	-	17.6	B	-	-

Alternative 3: this alternative would terminate the Inner Loop (two-way ramps) opposite Richmond Street with two way operations on Union Street north to E. Main Street. This alternative would

eliminate the need for westbound traffic on E. Main Street to use the Pitkin Street intersection and would allow left turns to occur at the E. Main Street/Union Street intersection.

- Richmond/Union @ IL On-Ramp – This intersection was assessed with stop sign control; however, while all most movements through the intersection would operate at acceptable levels, the Richmond Street approach would have extremely long delays during the weekday evening peak hour. The intersection is shown with traffic signal control. Considering, Richmond is a through street; it is recommended a signal be considered at this location. Overall acceptable levels of service would be achieved. This option would have the tendency to attract cut through traffic along Richmond Street.
- Union/University – the additional signal phases would impact the EB approach. The EB approach will drop in level of service with queuing to exceed capacity and may impact operations at the E. Main Street intersections during peak hours.

Reference: Inner Loop East – Intersection Alternatives – Capacity Analysis

ALTERNATIVE 3: TWO-WAY RAMP WITH LEFT AT S UNION STREET

Intersection	LANE GROUP	AM Peak Hour					PM Peak Hour				
		V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
S Union Street & Richmond Street *Signalized*	**EB-R (1)**			A			0.61	4.9	A	0	46
	WB-LTR (1)			A			0.15	31.7	C	13	42
	NB-L (1)			A			0.44	2.7	A	12	37
	NB-TR (1)			A			0.33	1.4	A	13	17
	SB-TR (1)			A			0.12	2.8	A	13	25
	Intersection	-		A	-	-	-	3.5	A	-	-
S Union Street & University Avenue *Signalized*	**EB-L (1)**			A			0.03	7.4	A	2	5
	EB-TR (1)			A			0.60	18.6	B	371	507
	WB-L (1)			A			0.10	11.6	B	8	22
	WB-TR (1)			A			0.52	16.0	B	199	290
	NB-L (1)			A			0.10	20.9	C	25	44
	NB-T (1)			A			0.51	30.3	C	180	206
	NB-R (1)			A			0.23	12.0	B	44	69
	SB-TR (1)			A			0.16	47.5	D	76	132
	Intersection	-		A	-	-	-	21.1	C	-	-
S Union Street & Main Street *Signalized*	**EB-L (1)**			A			0.01	16.7	B	2	5
	EB-TR (3)			A			0.67	26.7	C	147	204
	WB-L (1)			A			0.19	24.2	C	47	88
	WB-TR (3)			A			0.67	29.5	C	214	264
	NB-LT (1)			A			0.45	62.7	E	91	153
	NB-R (1)			A			0.53	35.3	D	90	158
	SB-LTR (1)			A			0.31	10.5	B	0	44
	Intersection	-		A	-	-	-	29.6	C	-	-
Main Street & University Avenue *Signalized*	**EB-L (1)**			A			0.26	23.9	C	6	12
	EB-TR (3)			A			0.50	16.1	B	62	77
	WB-TR (3)			A			0.64	2.4	A	1	1
	NB-L (1)			A			0.66	41.8	D	114	209
	NB-TR (2)			A			0.65	34.5	C	121	173
	SB-L (1)			A			0.88	49.8	D	294	480
	SB-TR (2)			A			0.36	25.6	C	98	139
	Intersection	-		A	-	-	-	21.1	C	-	-
Main Street & University Avenue/Pitkin Street *Signalized*	**EB-L (1)**			A			0.07	22.5	C	7	23
	EB-TR (2)			A			0.53	27.5	C	162	217
	WB-T (2)			A			0.26	5.3	A	22	47
	WB-R (1)			A			0.24	1.3	A	0	9
	SB-L (2)			A			0.22	23.9	C	59	89
	SB-TR (1)			A			0.05	20.7	C	12	33
	Intersection	-		A	-	-	-	24.0	C	-	-

Alternative 3A: this alternative offers a slight variation from Alternative 3 which would suggest leaving the Richmond Street/Inner Loop ramp intersection as an unsignalized intersection and converting Richmond Street as a one-way EB (away from Union Street) or creating a greenway street for neighborhood traffic only. This alternative would have several affects:

- Richmond/Union @ IL On-Ramp – Stop sign control would be sufficient to provide overall acceptable levels of operation with removal of Richmond Street traffic. Overall acceptable levels of service would be achieved. A one-way Richmond may still attract some cut-through traffic, but less than if signalized.

- Charlotte Street/Union – this intersection is projected to operate with long delays if stop-sign control is installed on the Charlotte Street approaches. However, based on the 2035 traffic volumes, traffic signal warrants may not be met. Hence, under this alternative, Charlotte Street should remain stop-sign controlled until volumes and delays meet warrants. This intersection may need to be reassessed with subsequent E. Main Street/University Avenue plans.

Various options were presented to the Richmond Street neighborhood such as closure of the street at Union Street, providing a right-out only diverter at Union Street, one-way travel patterns or do nothing. While these features are still being refined, the right-out diverter option is being moved forward as part of this assessment. More details will be identified of this approach through the final design phase.

Cycle Track Signal Analysis

What is a cycle track phase? A cycle track signal phase is an exclusive phase that would require all vehicles to stop and only allow bicycles to move. This phase is normally justified when volumes on a cycle track reach higher volumes. Typically a 10 second phase (w/ 4 seconds yellow and 2 seconds red) would be required. This phase was incorporated into the traffic signal operations at each of the corridor intersections and would impact intersection operations at each location. The Monroe/Chestnut and East Avenue intersections would see the greatest impact:

- Howell/Monroe/Chestnut – weekday evening peak operations would drop to overall LOS D with the northbound and southbound approaches failing with long queuing (300'-700').
- East Avenue/Union – the intersection would see a drop in levels of operation with the 4-lane section on East Avenue.

This option is not recommended at this time. When and if bicycle traffic increases to a level that would justify the need for additional traffic control, cycle track signal phase can be considered.

Reference: Inner Loop East – Intersection Alternatives – Capacity Analysis

DEDICATED CYCLE TRACK PHASE											
		AM Peak Hour					PM Peak Hour				
Intersection	LANE GROUP	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
Inner Loop/Howell Street & Chestnut Street/Monroe Avenue *Signalized*	EB-L (1)	0.65	31.1	C	112	238	0.46	29.6	C	44	82
	EB-T (1)	0.50	32.8	C	154	326	0.49	34.3	C	145	268
	EB-R (1)	0.26	3.1	A	0	31	0.14	0.4	A	0	0
	WB-L (1)	0.07	21.2	C	10	28	0.07	22.1	C	10	28
	WB-TR (2)	0.42	32.4	C	100	145	0.74	41.5	D	232	302
	NB-L (1)	0.75	44.7	D	86	147	1.29	187.6	F	189	355
	NB-TR (1)	0.71	35.9	D	265	357	0.51	26.9	C	186	275
	SB-T (1)	0.75	49.0	D	196	280	1.18	136.2	F	483	696
	SB-R (1)	0.20	0.3	A	0	0	0.85	6.5	A	0	0
	Intersection	-	29.9	C	-	-	-	51.2	D	-	-
S Union St & E Broad St *Signalized*	EB-L (1)	0.40	45.0	D	54	99	0.85	57.7	E	204	316
	EB-R (1)	0.17	13.7	B	0	29	0.37	7.1	A	0	47
	NB-L (1)	0.78	42.2	D	65	176	0.25	11.6	B	20	38
	NB-T (1)	0.72	21.5	C	322	467	0.72	20.4	C	340	448
	SB-TR (1)	0.91	30.7	C	148	576	0.78	18.8	B	139	163
	Intersection	-	28.6	C	-	-	-	24.6	C	-	-
S Union St & East Ave *Signalized*	EB-LTR (2)	0.37	29.2	C	66	103	0.81	42.3	D	194	272
	WB-LTR (2)	0.87	42.0	D	185	279	0.99	61.0	E	193	312
	NB-L (1)	0.45	19.9	B	26	47	0.18	14.7	B	17	27
	NB-TR (2)	0.64	22.6	C	123	202	0.95	42.8	D	307	268
	SB-L (1)	0.57	31.8	C	84	160	0.92	74.8	E	142	272
	SB-TR (2)	0.77	33.9	C	144	257	0.72	32.6	C	162	312
	Intersection	-	31.3	C	-	-	-	46.9	D	-	-
S Union St & Charlotte St *Signalized*	EB-LTR (1)	0.55	15.2	B	41	121	0.53	20.6	C	62	139
	WB-LTR (1)	0.20	27.3	C	29	67	0.30	28.7	C	45	93
	NB-L (1)	0.10	8.1	A	4	6	0.17	7.4	A	7	8
	NB-TR (2)	0.40	8.2	A	45	60	0.55	7.7	A	67	72
	SB-L (1)	0.06	15.6	B	6	19	0.13	17.0	B	8	25
	SB-TR (1)	0.54	21.9	C	203	298	0.56	21.7	C	216	315
	Intersection	-	14.7	B	-	-	-	14.5	B	-	-

v/c ratio = volume/capacity ratio
Source: Synchro 8/SimTraffic

The other option is to allow bicycles to cross when pedestrians are crossing. In this case, it is recommended that a leading pedestrian phase of 6 seconds be provided. This opportunity for pedestrians and bicyclists to get an advance to cross provides better visibility to motorists. The capacity analysis at the corridor intersections with an advanced 6 second pedestrian phase indicates:

Reference: Inner Loop East – Intersection Alternatives – Capacity Analysis

SIX SECOND LEAD Ped/Cycle Track Phase											
		AM Peak Hour					PM Peak Hour				
Intersection	LANE GROUP	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
Inner Loop/Howell Street & Chestnut Street/Monroe Avenue *Signalized*	EB-L (1)	0.52	21.6	C	92	163	0.46	29.6	C	44	82
	EB-T (1)	0.43	25.5	C	127	270	0.49	34.3	C	145	268
	EB-R (1)	0.24	4.6	A	0	45	0.14	0.5	A	0	0
	WB-L (1)	0.05	5.7	A	3	7	0.07	22.1	C	10	28
	WB-TR (2)	0.36	15.1	B	92	127	0.74	41.5	D	232	302
	NB-L (1)	0.66	33.6	C	79	120	0.98	77.2	E	136	305
	NB-TR (1)	0.67	31.2	C	243	324	0.41	18.7	B	153	227
	SB-T (1)	0.73	45.6	D	185	262	0.98	66.8	F	394	622
	SB-R (1)	0.20	0.3	A	0	0	0.85	6.5	A	0	0
	Intersection	-	22.8	C	-	-	-	31.4	C	-	-
S Union St & E Broad St *Signalized*	EB-L (1)	0.40	45.0	D	54	99	0.81	52.1	D	198	283
	EB-R (1)	0.17	13.7	B	0	29	0.36	6.7	A	0	45
	NB-L (1)	0.52	13.7	B	27	57	0.23	10.4	B	19	36
	NB-T (1)	0.61	9.9	A	296	174	0.70	18.3	B	322	424
	SB-TR (1)	0.73	16.4	B	142	181	0.74	18.5	B	141	214
	Intersection	-	14.8	B	-	-	-	22.6	C	-	-
S Union St & East Ave *Signalized*	EB-LTR (2)	0.34	26.9	C	64	96	0.74	36.6	D	183	250
	WB-LTR (2)	0.82	40.0	D	191	251	0.91	45.5	D	190	290
	NB-L (1)	0.36	10.5	B	21	34	0.14	10.5	B	16	21
	NB-TR (2)	0.51	14.9	B	122	143	0.82	30.1	C	296	192
	SB-L (1)	0.51	18.8	B	54	123	0.80	52.5	D	135	233
	SB-TR (2)	0.65	21.9	C	138	196	0.60	20.9	C	149	207
	Intersection	-	24.3	C	-	-	-	34.6	C	-	-
S Union St & Charlotte St *Signalized*	EB-LTR (1)	0.54	13.7	B	35	112	0.53	19.8	B	58	136
	WB-LTR (1)	0.20	27.0	C	28	66	0.30	28.6	C	45	93
	NB-L (1)	0.08	6.1	A	4	7	0.13	5.6	A	6	8
	NB-TR (2)	0.35	6.5	A	44	55	0.48	6.2	A	64	76
	SB-L (1)	0.05	12.2	B	5	16	0.10	12.3	B	7	21
	SB-TR (1)	0.48	17.1	B	178	261	0.49	16.1	B	183	267
	Intersection	-	12.1	B	-	-	-	12.0	B	-	-
v/c ratio = volume/capacity ratio											
Source: Synchro 8/SimTraffic											

This document provides an engineering assessment of capacity effects and geometric needs at each of the corridor intersections. Various sub options were either discussed or sketched with various stakeholders through the development process that may not be analyzed; some of these sub options may have addressed other geometric or operational opportunities, but may not affect the capacity analysis results already reflected in the options presented. This document does not reflect an all exhaustive list of every idea presented, however covers all the major options.

It is anticipated that the preferred treatment at each location will formulate the preferred corridor alternative. The analysis for the entire corridor will be refined to include the effects of the cycle track operations (6 second lead ped phase), reflect the final traffic volumes, reflect the storage lengths shown on the corridor concept, and include more accurate clearance intervals and other site specific characteristics at each location.

Reference: Inner Loop East – Intersection Alternatives – Capacity Analysis

Sincerely,

Paula Flores Benway, FITE
ITE Northeastern International Director
Associate, Transportation
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Appendix G – Traffic Analysis Contents

2035 Cycle Track Operations Memo

Synchro Files (available upon request)

Stantec

Memo

To:	Jim Hofmann Rochester Office	From:	Paula Benway Rochester Office
		Date:	February 28, 2014

Reference: Inner Loop – Cycle Track - Traffic Signal Operations

Per review comments received from the MCDOT on traffic signal phase sequencing associated with the introduction of the two-way cycle track, we have evaluated several options for consideration. The following details the option, operations, pros and cons and the impact on geometric and intersection operations. The traffic signal phase sequence to protect pedestrian and bicycle traffic through signalized intersections impacts the following intersections in the corridor. The other signalized intersections in the corridor are not impacted by the cycle track crossing.

- Monroe/Chestnut/Howell Intersection
- Broad Street/Union Street Intersection
- East Avenue/Union Street Intersection

Two-Way Cycle Tracks defined: two-way cycle tracks (also known as protected bike lanes, separated bikeways, and on-street bike paths) are physically separated cycle tracks that allow bicycle movement in both directions on one side of the road. Two-way cycle tracks share some design characteristics as one-way tracks, but may require additional considerations at driveway and side-street crossings. Improved visibility of cycle track users is important on the approaches to side street crossings.

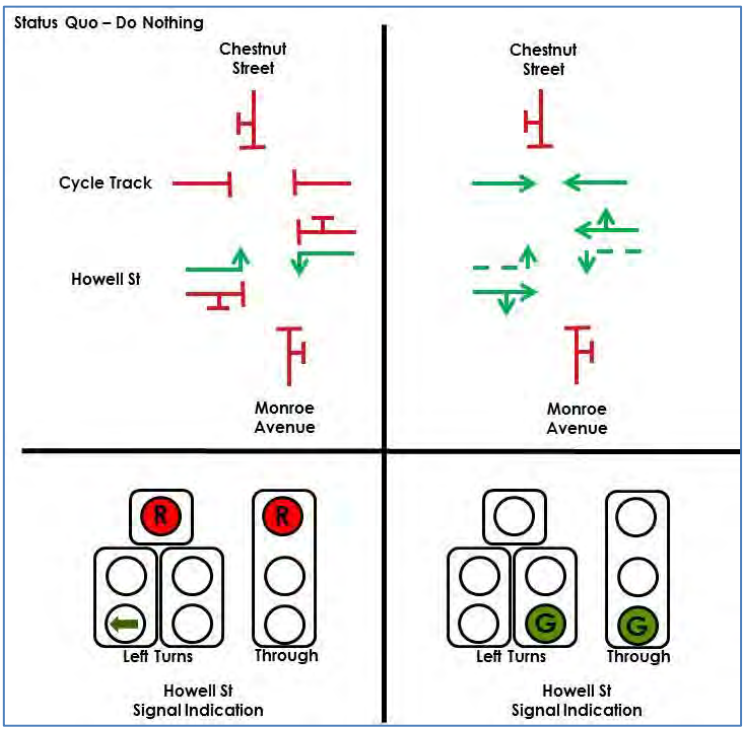
Various options were evaluated to address traffic signal phasing sequences and their associated conflicts at the above noted intersections.

Do Nothing – Status Quo Signal Operations

This option maintains standard traffic signal operations instructing bicyclists on the cycle track to use the pedestrian crossing signal indicators. It is anticipated that under this option, pedestrian crossing indications would automatically come up during each and every cycle. Push button or other bicycle detection systems could be considered to minimize delay. A schematic of the traffic signal indications for the conflicting vehicular movements and movements permitted through the intersection is shown below; this schematic is for illustrative purposes and not reflective of traffic signal plans. More specific phasing information is provided in the capacity analysis printouts attached.

Advantages: low cost; minimal signing required; no impact on motor vehicle capacity conditions.

Reference: Inner Loop – Cycle Track - Traffic Signal Operations



Disadvantages:

- A two-way cycle track introduces a contraflow bike lane that motorists may not have a clear line of sight. Either a permissive left turn vehicle or a right turn vehicle may not be aware a cyclist is approaching from behind and traveling at average speeds of 5-10mph. Unlike at pedestrian speeds, inadequate reaction time may result.
- The number one crash type between bicycles and vehicles involve operations with contra-flow bike operations. This type of conflict occurs as motor vehicle drivers have a hard time seeing a bicycle traveling in a contra-flow direction quick enough to react and avoid a conflict.
- In communities where high pedestrian and bicycle traffic is the norm, the higher the likelihood that motor vehicles would yield at crossings. In communities where low and infrequent pedestrian and bicycle traffic exists, the likely hood of motor vehicles yielding is diminished placing a higher incident risk at these crossing locations. In this case, the cycle-track will be a new facility and drivers may not initially yield.
- Bicycle signal heads are generally the preferred option over installing a sign instructing bicycles to use pedestrian signals. While instructing bicyclists to use pedestrian signals is a low-cost option, the length of the pedestrian clearance interval (typically timed at 3.5 feet per second) is usually inappropriate for bicyclists. The result is that approaching bicyclists have poor information about when it is safe and legal to enter the intersection[1].

Similar cycle track operations exist in Syracuse with signalized and stop sign controlled intersection crossings. One of the differences is the setting, heavy pedestrian and bicycle traffic is normal in an urban campus setting such as the case with the Syracuse cycle track.

[1] NACTO, Urban Bikeway Design Guide, Bicycle Signal Heads, pg 130.

Reference: Inner Loop – Cycle Track - Traffic Signal Operations

Provide Lead Pedestrian Interval

This option maintains standard traffic signal operations instructing bicyclists on the cycle track to use the pedestrian crossing signal indicators. A lead pedestrian interval of 6 seconds would be provided to allow pedestrian and bicycle traffic an advance start prior to motor vehicle movement. Lead pedestrian intervals have been shown to reduce pedestrian-vehicle collisions as much as 60% at treated intersections[2]. These lead intervals are critical at intersections where heavy right- or left-turning volumes create consistent conflicts and safety concerns between vehicles and pedestrians. This 6 second lead interval normally goes unnoticed by the motorist as they have a red signal indication; all conflicting motor vehicle movements through the intersection would have a red signal indication. This lead pedestrian interval is normally provided at locations with high pedestrian volumes. The lead pedestrian interval clears the intersection of all cyclists quickly and can help prevent conflicts with the contra-flow collisions. This interval would be provided in the direction of the cycle track flow. For example, if the cycle track is north/south, the lead pedestrian interval would be provided on the north/south crossing.

Typically in an urban environment where shared lanes (i.e. left/thru, thru/right) exist, all motor vehicle movements at the intersection would be shown a "red" signal indication, during the lead interval. This would be followed by a "green" signal indication for the parallel movements. If separate left turn and right turn lanes exist, the lead pedestrian interval would operate concurrently with the parallel thru movements only. In essence the left turns and right turns in the dedicated lanes can be controlled by their own "red" arrows.

At each of the three corridor intersections, dedicated left turn lanes are provided and left turn motorists would see a "red" arrow during the pedestrian lead interval. However, no dedicated right turn lanes are proposed at of these intersections. This means that when the parallel traffic stream gets the "green" signal indication, right turning traffic will have to yield to pedestrian and bicycle traffic.

Each of the three intersections also incorporated protected/permissive left turns. Protected/permissive left turns introduce additional complexities when combined with lead pedestrian phases and two-way cycle tracks. For example, if a lead pedestrian phase is provided and is followed by a protected/permissive left-turn, during the permissive portion of the left turn phase, drivers may not be aware of bicyclists approaching on the cycle track from the contra-flow direction.

Advantages:

- Low cost and minimal signing required.
- It allows the pedestrians/bikes that arrived during the "Do Not Cross" indication phase to advance safely into the crossing prior to conflicting vehicle turns. This could address a notable amount of the pedestrian/bike traffic; but does not address the random bike traffic arrivals after the 6 second interval.
- Minimizes the potential for opposing left/right turns conflicts with pedestrians/bicycles during the lead advance phase.

[2] National Association of City Transportation Officials, Urban Street Design Guide, 2013

Disadvantages:

- Slight increase in delay to motor vehicles as a result of longer red phase during the lead pedestrian interval.
- Randomly arriving cycle track users in the contra-flow lane are still at risk of conflict with permissive turning vehicles.

MCDOT Signal Phase Sequence

MCDOT suggested a lead pedestrian phase (discussed above) to be integrated with non-opposing thru movements. For example, at the Monroe/Chestnut intersection, the County suggested the following phasing sequence:

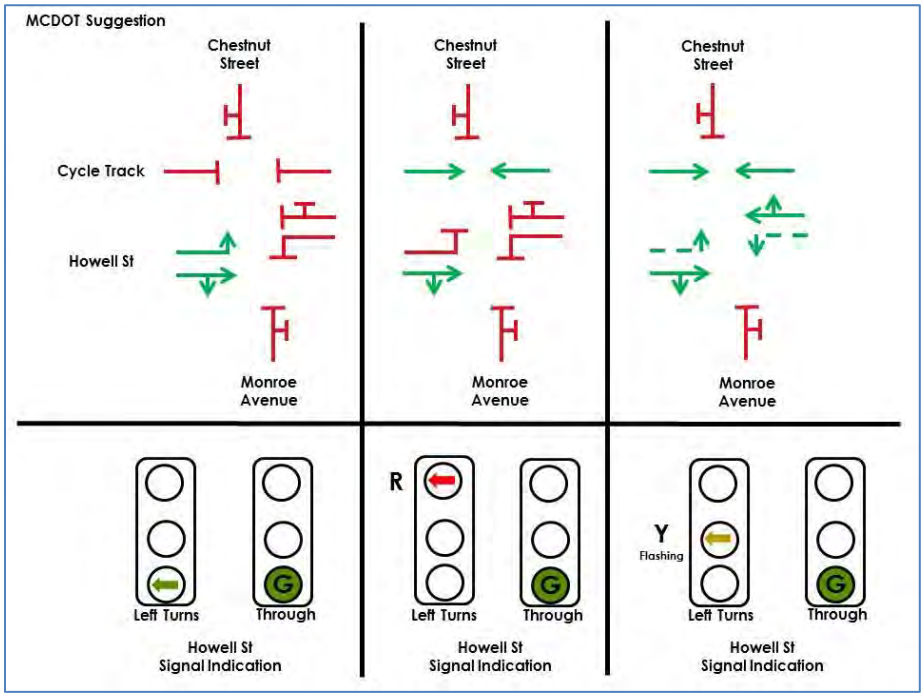
- Have an EB lead phase where left-turn and EB thru traffic receive "green" signal indication,
- Then the 6 second lead pedestrian phase would operate concurrently with the EB thru movement only (no conflicting movements). During this phase the EB left turn vehicles would have a "red" signal indication.
- After the lead pedestrian phase, the WB approach would receive "green" signal indication concurrent with the EB approach. At this point the EB left-turns would then become permissive with a "green" signal indication.

The complexity here is trying to articulate to motor vehicles that they have a protected (Green Arrow), followed by a prohibited phase (Red Arrow), and then followed by a permissive left-turn phase (Green Ball) all within the same cycle. This is not a normal phasing sequence in the region and would require the introduction of "flashing yellow arrow". This type of operation has been introduced by the NYSDOT in this region but at limited locations. This phase sequence option would not impact intersection delays.

Advantages:

- It allows the pedestrians/bikes that arrived during the "Do Not Cross" indication phase to advance safely into the crossing prior to conflicting vehicle turns. This could address a notable amount of the ped/bike traffic.
- Minimizes the potential for opposing left/right turn conflicts with pedestrians/bicycles during the lead advance phase.
- Bike detection for the cycle track could reduce delay.

Reference: Inner Loop – Cycle Track - Traffic Signal Operations



Disadvantages:

- Increased confusion for left turning vehicles with non-traditional phasing sequence (flashing yellow arrow).
- The 6 second "red" arrow may be short enough for motor vehicles to eventually ignore and then proceed through the intersection potentially creating conflicts with oncoming vehicles and with pedestrian/bicycle traffic.
- Randomly arriving cycle track users in the contra-flow lane are at conflict with permissive turning (left and right) vehicles.

<u>Optimized Option</u>

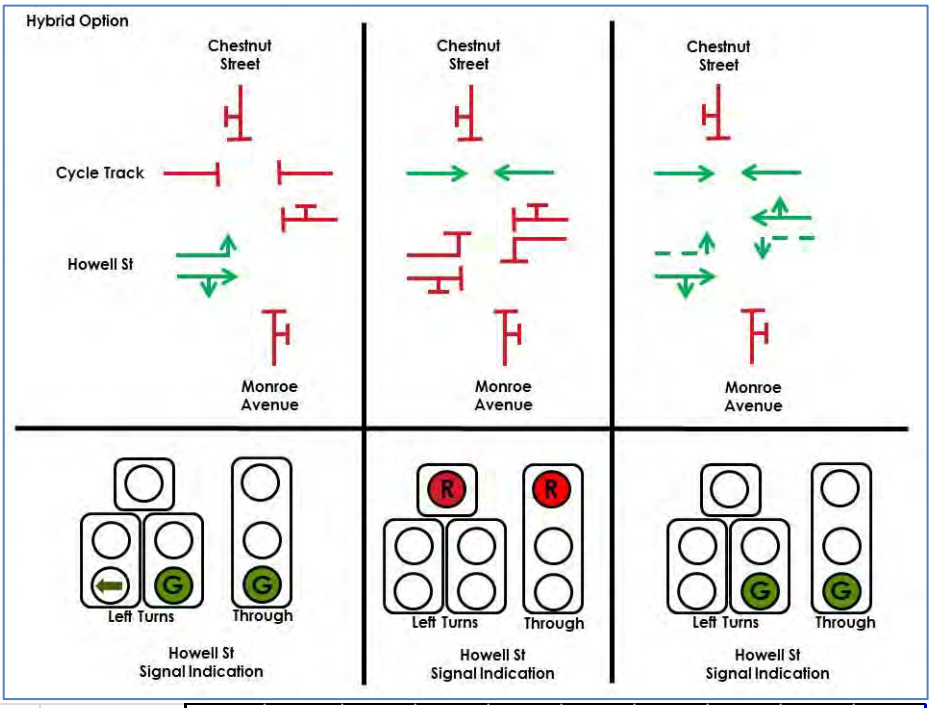
This option would:

- Have an EB phase where left-turn traffic receives a "green arrow" signal indication, or a protected phase.
- Then the 6 second lead pedestrian phase for only pedestrian/bicycle traffic. During this phase all EB/WB vehicles would have a "red ball" signal indication.
- After the lead pedestrian phase, the EB/WB approaches would receive "green ball" signal indication. At this point the EB left-turns would become permissive with a "green" signal indication.

The advantage to the recommended phasing sequence is that it minimizes phasing confusion with introduction on non-traditional phasing. This phasing sequence still does not address the conflict with permissive turns, but with the lead phase it has been minimized to the extent practical without introducing protected phasing. This phasing sequence still has the same advantages and disadvantages as the MCDOT suggested phasing.

Reference: Inner Loop – Cycle Track - Traffic Signal Operations

This option optimizes intersection operations. Overall, all three intersections will have acceptable levels with only one movement at the East Avenue intersection estimated to operate with a v/c ratio of 0.97.



Intersection	LANE GROUP	Phasing with Cycle and Offset Optimization									
		AM Peak Hour					PM Peak Hour				
		V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
Inner Loop/Howell Street & Chestnut Street/Monroe Avenue *Signalized*	**EB-L (1)**	0.68	27.4	C	78	119	0.50	29.9	C	40	75
	EB-TR (1)	0.85	36.0	D	182	265	0.76	39.1	D	177	282
	WB-TR (2)	0.41	18.7	B	32	66	0.95	44.0	D	217	301
	NB-L (1)	0.43	19.2	B	46	97	0.89	54.3	D	100	272
	NB-TR (1)	0.59	22.0	C	126	250	0.40	13.7	B	90	150
	SB-L (1)	0.24	31.2	C	28	63	0.10	23.1	C	14	36
	SB-T (1)	0.54	34.2	C	139	223	0.87	45.7	D	332	523
	SB-R (1)	0.20	0.3	A	0	0	0.85	6.6	A	0	0
	Intersection	-	23.6	C	-	-	-	27.6	C	-	-
S Union Street & E Broad Street *Signalized*	**EB-L (1)**	0.37	39.3	D	48	90	0.78	48.2	D	198	272
	EB-R (1)	0.21	36.3	D	21	49	0.56	39.2	D	103	159
	NB-L (1)	0.44	9.2	A	15	45	0.22	9.4	A	14	30
	NB-T (1)	0.61	7.4	A	30	187	0.72	18.3	B	174	352
	SB-TR (1)	0.83	21.9	C	154	510	0.78	17.3	B	150	175
	Intersection	-	15.6	B	-	-	-	24.5	C	-	-
S Union Street & East Avenue *Signalized*	**EB-L (1)**	0.14	18.5	B	11	28	0.17	16.8	B	16	37
	EB-TR (1)	0.55	33.7	C	121	196	0.97	62.2	E	399	630
	WB-L (1)	0.52	25.8	C	67	115	0.54	27.5	C	36	68
	WB-TR (1)	0.85	46.3	D	246	436	0.71	33.9	C	271	413
	NB-L (1)	0.74	40.1	D	43	162	0.54	42.1	D	23	40
	NB-TR (2)	0.49	13.5	B	103	132	0.90	37.7	D	182	295
	SB-L (1)	0.61	20.5	C	64	106	0.89	53.5	D	109	259
	SB-TR (1)	0.67	27.4	C	223	336	0.79	42.0	D	280	426
	Intersection	-	27.6	C	-	-	-	43.5	D	-	-

v/c ratio = volume/capacity ratio
Source: Synchro 8/SimTraffic

Reference: Inner Loop – Cycle Track - Traffic Signal Operations

Lag Left Turn Option

Another option considered was providing permissive lead phases followed by a protected lag left turn phase. Intersection operations at the East Avenue intersection were not favorable and are shown below. This option is not recommended and has the same advantages and disadvantages as the prior two options.

		Permissive Lag Left Phasing									
		AM Peak Hour					PM Peak Hour				
Intersection	LANE GROUP	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
Inner Loop/Howell Street & Chestnut Street/Monroe Avenue *Signalized*	EB-L (1)	0.59	34.2	C	110	149	0.50	43.9	D	45	83
	EB-TR (1)	0.82	38.2	D	262	342	0.69	36.1	D	196	298
	WB-TR (2)	0.63	30.0	C	82	125	0.95	47.1	D	205	325
	NB-L (1)	0.31	10.1	B	66	93	0.86	48.1	D	126	254
	NB-TR (1)	0.46	13.9	B	197	328	0.38	15.9	B	120	222
	SB-L (1)	0.17	26.6	C	25	66	0.09	21.6	C	14	35
	SB-T (1)	0.38	26.9	C	125	231	0.78	36.8	D	320	498
	SB-R (1)	0.20	0.3	A	0	0	0.85	6.6	A	0	0
	Intersection	-	23.2	C	-	-	-	26.6	C	-	-
S Union Street & E Broad Street *Signalized*	EB-L (1)	0.40	45.0	D	54	99	0.80	50.0	D	198	277
	EB-R (1)	0.22	41.5	D	24	53	0.57	40.1	D	103	161
	NB-L (1)	0.50	18.7	B	51	84	0.23	6.9	A	8	16
	NB-T (1)	0.61	13.6	B	244	353	0.71	10.5	B	182	274
	SB-TR (1)	0.77	14.0	B	151	187	0.78	15.0	B	150	173
	Intersection	-	16.6	B	-	-	-	21.0	C	-	-
S Union Street & East Avenue *Signalized*	EB-L (1)	0.14	20.1	C	12	30	0.19	18.9	B	17	39
	EB-TR (1)	0.57	37.7	D	135	213	1.04	82.8	F	453	665
	WB-L (1)	0.51	26.7	C	74	124	0.54	29.1	C	38	71
	WB-TR (1)	0.83	46.2	D	268	447	0.76	38.7	D	285	465
	NB-L (1)	0.69	40.4	D	30	113	0.27	26.0	C	22	29
	NB-TR (2)	0.63	22.8	C	100	148	0.99	53.0	D	223	463
	SB-L (1)	0.69	45.7	D	106	172	0.99	95.7	F	115	273
	SB-TR (1)	0.79	41.2	D	304	444	0.74	38.8	D	280	426
	Intersection	-	35.7	D	-	-	-	56.3	E	-	-

v/c ratio = volume/capacity ratio
Source: Synchro 8/SimTraffic

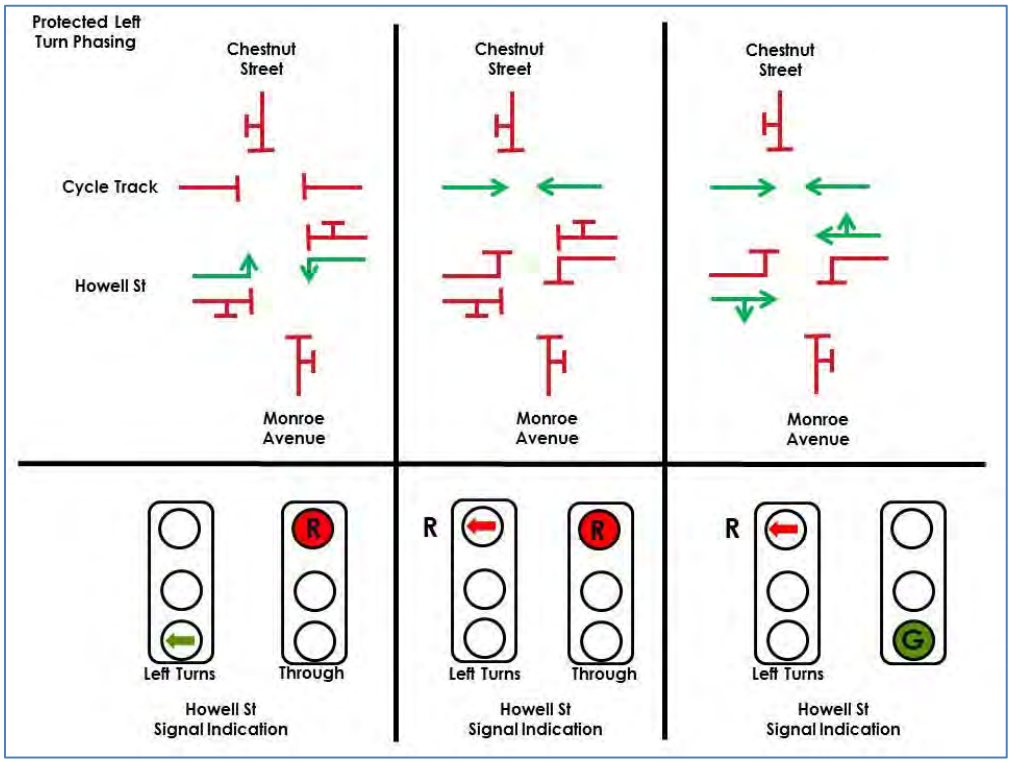
Protected Left-Turn Signal Phase Sequence

This option would provide protected left turn phasing only, no permissive left turns would be allowed to minimize conflicts with the pedestrian and cycle track users. For example, at the Monroe/Chestnut intersection the following phasing sequence:

- Have an EB lead phase where left-turn and EB thru traffic receive "green" signal indication,
- Then the 6 second lead pedestrian phase would operate concurrently with the EB thru movement only (no conflicting movements). During this phase the EB left turn vehicles would have a "red" signal indication.
- After the lead pedestrian phase, the WB approach would receive "green" signal indication concurrent with the EB thru traffic. At this point the EB left-turns would still have a "red" signal indication.

This option would affect intersection operations slightly. Overall Level D or better would still be provided at each intersection. However, additional movements will operate with volume/capacity

ratios above desired levels during the evening peak hour. This means that during the weekday evening peak hour, some movements may experience intersection variability. However, it should be kept in mind that these operations are reflective of projected traffic volumes by the year 2035. Intersection operations are anticipated to be better during other hours of the day.



Advantages:

- Eliminates left turn conflicts with pedestrians/bicycles on the cycle track side of the intersection.
- Keeps the signal phasing sequence simple with traditional operations.
- Bike detection for the cycle track could reduce delay.

Disadvantages:

- Randomly arriving cycle track users in the contra-flow lane are still at risk of conflict with permissive right turn vehicles.
- In order to make the cycle track users fully protected, left and right turn lanes and protected phasing for these movements would need to be incorporated. This would not only increase the geometric footprint of the three intersections, but also would impact intersection motor vehicle delays for both movements.

Reference: Inner Loop – Cycle Track - Traffic Signal Operations

		Protected Left Turn Only									
		AM Peak Hour					PM Peak Hour				
Intersection	LANE GROUP	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
	EB-L (1)	0.73	50.3	D	143	222	0.70	71.5	E	63	142
	EB-TR (1)	0.60	19.2	B	190	292	0.53	25.1	C	172	262
Inner Loop/Howell Street &	WB-T (2)	0.67	45.8	D	112	160	0.95	62.1	E	232	346
Chestnut Street/Monroe Avenue	NB-L (1)	0.51	23.8	C	51	112	0.97	74.4	E	153	297
Signalized	NB-TR (1)	0.63	24.7	C	134	255	0.41	18.6	B	126	257
	SB-L (1)	0.27	35.2	D	31	69	0.11	24.6	C	15	38
	SB-T (1)	0.59	39.6	D	155	241	0.92	54.5	D	343	548
	SB-R (1)	0.20	0.3	A	0	0	0.85	6.6	A	0	0
	Intersection	-	28.1	C	-	-	-	33.9	C	-	-
	EB-L (1)	0.37	39.3	D	48	90	0.82	50.5	D	179	284
	EB-R (1)	0.21	36.3	D	21	49	0.58	38.4	D	93	153
S Union Street &	NB-L (1)	0.59	35.7	D	70	153	0.39	38.0	D	43	69
E Broad Street	NB-T (1)	0.49	4.7	A	70	272	0.61	12.0	B	232	340
Signalized	SB-T (1)	0.91	27.8	C	136	478	0.82	20.4	C	149	167
	Intersection	-	19.7	B	-	-	-	24.5	C	-	-
	EB-L (1)	0.13	18.4	B	11	28	0.16	15.5	B	15	34
	EB-TR (1)	0.56	34.8	C	123	199	0.99	65.2	E	395	596
	WB-L (1)	0.51	25.2	C	67	115	0.50	23.6	C	32	62
S Union Street &	WB-TR (1)	0.84	46.1	D	250	448	0.72	32.4	C	248	414
East Avenue	NB-L (1)	0.82	76.0	E	69	187	0.41	47.7	D	30	48
Signalized	NB-TR (2)	0.59	22.2	C	166	247	0.95	43.2	D	190	319
	SB-L (1)	0.58	19.2	B	66	110	0.93	60.7	E	89	231
	SB-T (1)	0.89	55.6	E	265	448	0.97	69.4	E	264	459
	Intersection	-	37.6	D	-	-	-	50.5	D	-	-

v/c ratio = volume/capacity ratio
Source: Synchro 8/SimTraffic

Cycle Track Visibility

As the two-way cycle track will be the first in the region, for each of the options outlined above, several items should be considered to maximize cycle track visibility.

- Initiate a local educational campaign on different bicycle facilities and their use. This corridor will have a variety of bicycle facilities (cycle track, bike lanes, contra-flow lanes, bike boxes, and two-stage turning queue boxes). Public service announcements, news coverage and website information should be considered. Collaboration with a bicycle advocacy group would be ideal in reaching out to users involved in local bicycling clubs.
- Install temporary signs to warn all motorists of new facilities for the initial few months upon opening of the facility, similar to when a new traffic signal is installed.
- Higher order of Intersection crossing markings consisting of shared lane markings, colored conflict area, or elephant's feet markings may be used to contrast with the adjacent pedestrian area or to increase the visibility of the cycle track in the conflict areas (intersection approaches and crossings). This raises awareness for both bicyclists and motorists. These treatments reinforce that through bicyclists have priority over turning vehicles or vehicle entering the roadway.
- Provide supplemental signs (temporary or permanent) "yield to bikes" at appropriate locations along the corridor. This maybe at intersections, at side streets, or at major driveway crossings of the cycle track.

Reference: Inner Loop – Cycle Track - Traffic Signal Operations

- Cycle track may be shifted more closely to the travel lanes on the minor street intersection approaches to put bicyclists clearly in the field of view of motorists.

Again, the introduction of a two-way cycle track in the Union Street corridor will be the first in the region, the use and volume of bicycles and pedestrian traffic may not materialize for some time as potential growth and development occurs in the general area. At some point in the future, when and if volume and operational conflicts arise, additional more restricted intersection controls and operations can be instituted. These include:

Provision of Right Turn Lanes **-** As identified above, the option to provide right turn lanes in combination with fully protected signal phasing for right and left turning vehicles was considered. Provision of right turn lanes at each of the three intersections is possible with minor adjustments to the curb/parking lane. The right turn lanes do not have to be long, just of adequate length to provide restrictive arrow during the pedestrian lead phase on the side street. It is anticipated that provision of right turn lanes at the three intersections would eliminate some parking spaces. A couple of the movements would still operate with high volume/ capacity ratios during only the evening peak hour; however, overall acceptable levels of service.

		Protected Left and Right-Turn Movements									
		AM Peak Hour					PM Peak Hour				
Intersection	LANE GROUP	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
Inner Loop/Howell Street & Chestnut Street/Monroe Avenue *Signalized*	EB-L (1)	0.73	50.3	D	143	222	0.54	53.8	D	61	113
	EB-TR (1)	0.63	21.5	C	216	292	0.55	25.9	C	172	262
	WB-T (2)	0.38	34.4	C	85	119	0.74	40.2	D	213	281
	WB-R (1)	0.33	42.6	D	41	79	0.08	35.1	D	12	34
	NB-L (1)	0.45	21.5	C	50	112	0.94	68.3	E	159	301
	NB-TR (1)	0.58	22.4	C	132	255	0.40	18.4	B	124	262
	SB-L (1)	0.24	33.7	C	30	68	0.10	23.8	C	14	37
	SB-T (1)	0.56	37.6	D	151	241	0.89	49.6	D	337	535
	SB-R (1)	0.20	0.3	A	0	0	0.85	6.6	A	0	0
	Intersection	-	26.2	C	-	-	-	28.2	C	-	-
S Union Street & E Broad Street *Signalized*	EB-L (1)	0.37	39.3	D	48	90	0.76	42.6	D	174	246
	EB-R (1)	0.21	36.3	D	21	48	0.54	34.5	C	90	143
	NB-L (1)	0.59	34.0	C	76	134	0.39	35.0	C	36	64
	NB-T (1)	0.49	5.2	A	137	295	0.63	14.1	B	296	420
	SB-T (1)	0.42	6.6	A	42	78	0.59	9.8	A	86	106
	SB-R (1)	0.42	12.2	B	39	78	0.11	8.4	A	10	16
	Intersection	-	12.1	B	-	-	-	20.0	B	-	-
S Union Street & East Avenue *Signalized*	EB-L (1)	0.11	16.4	B	10	26	0.15	14.8	B	14	33
	EB-TR (1)	0.55	33.7	C	121	196	0.98	63.6	E	392	596
	WB-L (1)	0.46	21.2	C	63	108	0.45	21.1	C	31	61
	WB-TR (1)	0.78	39.4	D	240	424	0.71	31.9	C	248	414
	NB-L (1)	0.66	59.0	E	68	150	0.41	49.2	D	33	49
	NB-TR (2)	0.61	21.1	C	177	107	0.98	47.2	D	205	421
	SB-L (1)	0.66	25.0	C	72	130	0.95	66.7	E	91	241
	SB-T (1)	0.77	38.1	D	236	389	0.67	32.6	C	218	329
	SB-R (1)	0.10	27.3	C	17	42	0.08	26.3	C	39	25
	Intersection	-	31.5	C	-	-	-	46.1	D	-	-

v/c ratio = volume/capacity ratio
Source: Synchro 8/SimTraffic

Reference: Inner Loop – Cycle Track - Traffic Signal Operations

Bicycle Signals **-** When and if cycle track volume and increased conflicts occur, full bicycle signals could be considered at the three intersections. Bicycle signals are typically used to improve identified safety or operational problems involving bicycle facilities or to provide guidance for bicyclist at intersections where they may have different needs from other road users (e.g., bicycle only movements, leading bicycle intervals). Bicycle signals separates bicycle movements from conflicting motor vehicle, or pedestrian movement and provides priority to bicycle movements at intersection. This protects bicyclists in the intersection, which may improve real and perceived safety at high-conflict areas. This also provides improved operation and provides appropriate information for bicyclists. While a dedicated bicycle signal is generally desirable from a safety point of view, an added signal phase lengthens the overall cycle length and exacerbates delay for all users. Bicycle signals and bicycle phases are common in heavy bicycle use corridors in cities such as Washington, DC, New York, NY, Portland, OR, San Francisco, CA and other major metropolitan cities.

Summary

- The introduction of a two-way cycle track along the Union Street corridor will require careful attention to maximize visibility of all users at the crossings and minimize conflicts.
- The contra-flow bike approach is the critical/vulnerable movement at the crossing locations.
- Various signal phasing sequences are identified to address this movement, with the Protected Left Turn Phasing option providing the greatest level of conflict avoidance. While intersection operations during the peak hour may not be as desirable, minimizing conflicts is important.
- Various communities across the country have chosen to realign their performance measures with broader aims, including economic, growth, public health, sustainability and mode shift. What this means is that communities are moving away from Level of Service (LOS) being the only performance measure in urban settings.
- Additional considerations to improve cycle track visibility will be incorporated in the design.
- Right turning vehicle movements conflicts are still possible with the current design and can be addressed only with the addition of more restrictive intersection operations, the addition of right turn lanes, or the additional of bicycle signals/phasing. These treatments are possible and can be considered as growth occurs in the corridor.

We hope this information is helpful in determining the phasing sequence at the noted intersections.

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Attachments: Capacity Analysis Printouts

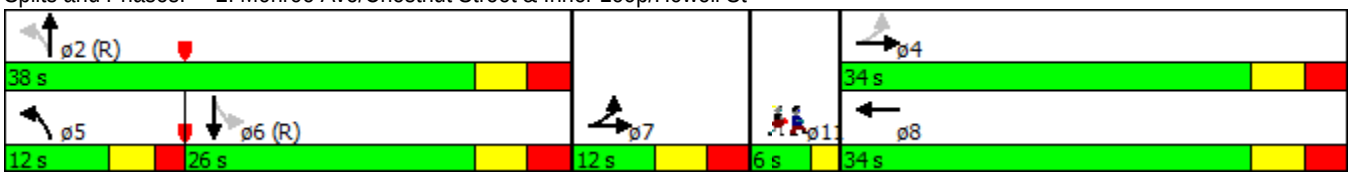
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	229	303	167	0	274	66	168	435	1	56	258	293
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	100		250	250		0	100		0
Storage Lanes	1		0	0		1	1		0	1		1
Taper Length (ft)	75			75			75			75		
Right Turn on Red			Yes			No			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		973			457			741			768	
Travel Time (s)		22.1			10.4			16.8			17.5	
Confl. Peds. (#/hr)	30		30	30		30	22		10	10		22
Confl. Bikes (#/hr)						20						
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
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	241	495	0	0	357	0	177	459	0	59	272	308
Turn Type	custom	NA			NA		pm+pt	NA		Perm	NA	Free
Protected Phases	7	4 7			8		5	2			6	
Permitted Phases	4						2			6		Free
Detector Phase	7	4 7			8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0				10.0		7.0	10.0		10.0	10.0	
Minimum Split (s)	11.5				22.5		12.0	23.5		23.5	23.5	
Total Split (s)	12.0				34.0		12.0	38.0		26.0	26.0	
Total Split (%)	13.3%				37.8%		13.3%	42.2%		28.9%	28.9%	
Yellow Time (s)	3.5				3.5		3.0	3.5		3.5	3.5	
All-Red Time (s)	3.0				3.0		2.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.5				-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	5.0				5.0		3.5	5.0		5.0	5.0	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Recall Mode	None				Min		None	C-Max		C-Max	C-Max	
Act Effct Green (s)	31.5	31.5			24.5		39.0	37.5		24.4	24.4	90.0
Actuated g/C Ratio	0.35	0.35			0.27		0.43	0.42		0.27	0.27	1.00
v/c Ratio	0.68	0.85			0.41		0.43	0.59		0.24	0.54	0.20
Control Delay	27.4	36.0			18.7		19.2	22.0		31.2	34.2	0.3
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	27.4	36.0			18.7		19.2	22.0		31.2	34.2	0.3
LOS	C	D			B		B	C		C	C	A
Approach Delay		33.2			18.7			21.2			17.6	
Approach LOS		C			B			C			B	
Queue Length 50th (ft)	78	182			32		46	126		28	139	0
Queue Length 95th (ft)	119	265			66		m97	250		63	223	0
Internal Link Dist (ft)		893			377			661			688	
Turn Bay Length (ft)	200						250			100		
Base Capacity (vph)	353	664			1030		414	776		248	504	1554
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

Lane Group	ø4	ø11
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Right Turn on Red		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Heavy Vehicles (%)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	4	11
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	10.0	4.0
Minimum Split (s)	22.5	6.0
Total Split (s)	34.0	6.0
Total Split (%)	38%	7%
Yellow Time (s)	3.5	2.0
All-Red Time (s)	3.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	Min	Max
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.68	0.75			0.35		0.43	0.59		0.24	0.54	0.20

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 4 (4%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 23.6	Intersection LOS: C
Intersection Capacity Utilization 72.8%	ICU Level of Service C
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 2: Monroe Ave/Chestnut Street & Inner Loop/Howell St



Lane Group	ø4	ø11
Reduced v/c Ratio		

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø2	ø11
Lane Configurations								
Volume (vph)	81	36	168	653	396	209		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Storage Length (ft)	0	0	100			0		
Storage Lanes	1	1	1			0		
Taper Length (ft)	25		75					
Right Turn on Red		No				No		
Link Speed (mph)	30			30	30			
Link Distance (ft)	134			240	437			
Travel Time (s)	3.0			5.5	9.9			
Confl. Peds. (#/hr)		34	30			30		
Confl. Bikes (#/hr)						20		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90		
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	90	40	187	726	672	0		
Turn Type	NA	Perm	custom	NA	NA			
Protected Phases	4		5	2 5	6		2	11
Permitted Phases		4	2					
Detector Phase	4	4	5	2 5	6			
Switch Phase								
Minimum Initial (s)	10.0	10.0	5.0		20.0		20.0	4.0
Minimum Split (s)	24.5	24.5	10.5		25.5		25.5	6.0
Total Split (s)	25.0	25.0	11.0		48.0		48.0	6.0
Total Split (%)	27.8%	27.8%	12.2%		53.3%		53%	7%
Yellow Time (s)	3.5	3.5	3.5		3.5		3.5	2.0
All-Red Time (s)	2.0	2.0	2.0		2.0		2.0	0.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5		-1.5			
Total Lost Time (s)	4.0	4.0	4.0		4.0			
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None		C-Max		C-Max	Max
Act Effct Green (s)	12.6	12.6	57.8	58.6	44.0			
Actuated g/C Ratio	0.14	0.14	0.64	0.65	0.49			
v/c Ratio	0.37	0.21	0.44	0.61	0.83			
Control Delay	39.3	36.3	9.2	7.4	21.8			
Queue Delay	0.0	0.0	0.0	0.0	0.1			
Total Delay	39.3	36.3	9.2	7.4	21.9			
LOS	D	D	A	A	C			
Approach Delay	38.4			7.8	21.9			
Approach LOS	D			A	C			
Queue Length 50th (ft)	48	21	15	30	154			
Queue Length 95th (ft)	90	49	m45	187	#510			
Internal Link Dist (ft)	54			160	357			
Turn Bay Length (ft)			100					
Base Capacity (vph)	405	326	427	1189	813			
Starvation Cap Reductn	0	0	0	0	5			
Spillback Cap Reductn	0	0	0	0	0			
Storage Cap Reductn	0	0	0	0	0			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø2	ø11
Reduced v/c Ratio	0.22	0.12	0.44	0.61	0.83			

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 87 (97%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 15.6 Intersection LOS: B
Intersection Capacity Utilization 67.2% 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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: S Union St & E Broad St

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	191	35	160	331	78	124	532	78	198	410	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	175		0	100		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	75			75			75			75		
Right Turn on Red			No			Yes			Yes			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		148			496			437			655	
Travel Time (s)		3.4			11.3			9.9			14.9	
Confl. Peds. (#/hr)	59		15	15		59	23		29	29		23
Confl. Bikes (#/hr)												20
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
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	5%	5%	5%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	31	251	0	178	455	0	138	678	0	220	494	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		pm+pt	NA	
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	20.0		5.0	20.0		20.0	20.0		5.0	20.0	
Minimum Split (s)	10.0	28.0		10.0	28.0		25.5	25.5		10.0	25.5	
Total Split (s)	10.0	29.0		10.0	29.0		41.0	41.0		10.0	41.0	
Total Split (%)	11.1%	32.2%		11.1%	32.2%		45.6%	45.6%		11.1%	45.6%	
Yellow Time (s)	3.0	3.5		3.0	3.5		3.5	3.5		3.0	3.5	
All-Red Time (s)	2.0	2.5		2.0	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	3.5	4.5		3.5	4.5		4.0	4.0		3.5	4.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	Min		None	Min		C-Max	C-Max		None	C-Max	
Act Effct Green (s)	30.8	23.3		32.2	27.3		37.0	37.0		45.2	37.0	
Actuated g/C Ratio	0.34	0.26		0.36	0.30		0.41	0.41		0.50	0.41	
v/c Ratio	0.14	0.55		0.52	0.85		0.74	0.49		0.61	0.67	
Control Delay	18.5	33.7		25.8	46.3		40.1	13.5		20.5	27.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.3	
Total Delay	18.5	33.7		25.8	46.3		40.1	13.5		20.5	27.4	
LOS	B	C		C	D		D	B		C	C	
Approach Delay		32.0			40.5			18.0			25.3	
Approach LOS		C			D			B			C	
Queue Length 50th (ft)	11	121		67	246		43	103		64	223	
Queue Length 95th (ft)	28	196		115	#436		m#162	132		106	336	
Internal Link Dist (ft)		68			416			357			575	
Turn Bay Length (ft)				175			100			250		
Base Capacity (vph)	226	482		344	538		186	1381		361	736	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	35	
Storage Cap Reductn	0	0		0	0		0	0		0	0	

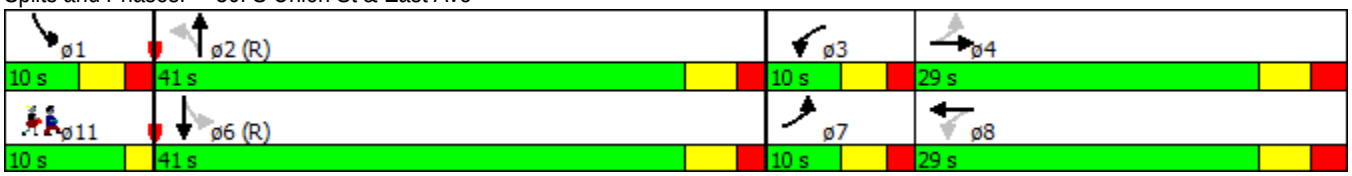
Lane Group	ø11
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	11
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	6.0
Total Split (s)	10.0
Total Split (%)	11%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.14	0.52		0.52	0.85		0.74	0.49		0.61	0.70	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 27.6 Intersection LOS: C
Intersection Capacity Utilization 81.4% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 30: S Union St & East Ave



Lane Group	ø11
Reduced v/c Ratio	

Intersection Summary

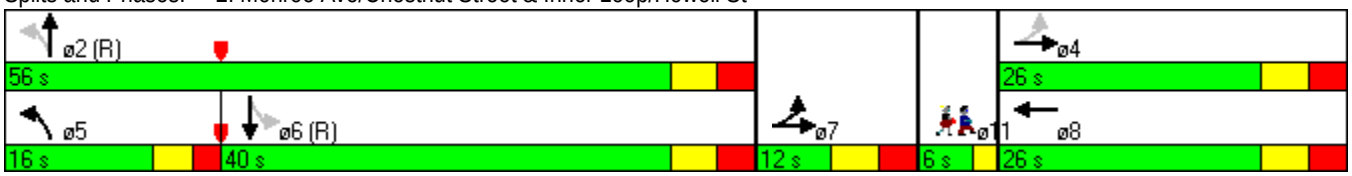
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	94	276	84	0	641	21	263	340	15	31	536	1285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	100		250	250		0	100		0
Storage Lanes	1		0	0		1	1		0	1		1
Taper Length (ft)	75			75			75			75		
Right Turn on Red			Yes			No			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		973			457			741			768	
Travel Time (s)		22.1			10.4			16.8			17.5	
Confl. Peds. (#/hr)	30		30	30		30	14		41	41		
Confl. Bikes (#/hr)						20						
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	99	379	0	0	697	0	277	374	0	33	564	1353
Turn Type	custom	NA			NA		pm+pt	NA		Perm	NA	Free
Protected Phases	7	4 7			8		5	2			6	
Permitted Phases	4						2			6		Free
Detector Phase	7	4 7			8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0				10.0		7.0	10.0		10.0	10.0	
Minimum Split (s)	11.5				22.5		12.0	23.5		23.5	23.5	
Total Split (s)	12.0				26.0		16.0	56.0		40.0	40.0	
Total Split (%)	12.0%				26.0%		16.0%	56.0%		40.0%	40.0%	
Yellow Time (s)	3.5				3.5		3.0	3.5		3.5	3.5	
All-Red Time (s)	3.0				3.0		2.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.5				-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	5.0				5.0		3.5	5.0		5.0	5.0	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Recall Mode	None				Min		None	C-Max		C-Max	C-Max	
Act Effct Green (s)	28.0	28.0			21.0		52.5	51.0		35.0	35.0	100.0
Actuated g/C Ratio	0.28	0.28			0.21		0.52	0.51		0.35	0.35	1.00
v/c Ratio	0.50	0.76			0.95		0.89	0.40		0.10	0.87	0.85
Control Delay	29.9	39.1			44.0		54.3	13.7		23.1	45.7	6.6
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	29.9	39.1			44.0		54.3	13.7		23.1	45.7	6.6
LOS	C	D			D		D	B		C	D	A
Approach Delay		37.2			44.0			31.0			18.2	
Approach LOS		D			D			C			B	
Queue Length 50th (ft)	40	177			217		100	90		14	332	0
Queue Length 95th (ft)	75	#282			m#301		#272	150		36	#523	0
Internal Link Dist (ft)		893			377			661			688	
Turn Bay Length (ft)	200						250			100		
Base Capacity (vph)	197	501			737		312	940		326	652	1583
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	0.50	0.76			0.95		0.89	0.40		0.10	0.87	0.85

Lane Group	ø4	ø11
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Right Turn on Red		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	4	11
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	10.0	4.0
Minimum Split (s)	22.5	6.0
Total Split (s)	26.0	6.0
Total Split (%)	26%	6%
Yellow Time (s)	3.5	2.0
All-Red Time (s)	3.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	Min	Max
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 27.6	Intersection LOS: C
Intersection Capacity Utilization 82.3%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 2: Monroe Ave/Chestnut Street & Inner Loop/Howell St



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø2	ø11
Lane Configurations								
Volume (vph)	290	161	65	673	510	60		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Storage Length (ft)	0	0	100			0		
Storage Lanes	1	1	1			0		
Taper Length (ft)	25		75					
Right Turn on Red		No				No		
Link Speed (mph)	30			30	30			
Link Distance (ft)	134			240	437			
Travel Time (s)	3.0			5.5	9.9			
Confl. Peds. (#/hr)		43	30			30		
Confl. Bikes (#/hr)						20		
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86		
Heavy Vehicles (%)	2%	2%	1%	1%	2%	2%		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	337	187	76	783	663	0		
Turn Type	NA	Perm	custom	NA	NA			
Protected Phases	4		5	2 5	6		2	11
Permitted Phases		4	2					
Detector Phase	4	4	5	2 5	6			
Switch Phase								
Minimum Initial (s)	10.0	10.0	5.0		20.0		20.0	4.0
Minimum Split (s)	24.5	24.5	10.5		25.5		25.5	6.0
Total Split (s)	32.0	32.0	11.0		51.0		51.0	6.0
Total Split (%)	32.0%	32.0%	11.0%		51.0%		51%	6%
Yellow Time (s)	3.5	3.5	3.5		3.5		3.5	2.0
All-Red Time (s)	2.0	2.0	2.0		2.0		2.0	0.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5		-1.5			
Total Lost Time (s)	4.0	4.0	4.0		4.0			
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None		C-Max		C-Max	Max
Act Effct Green (s)	24.4	24.4	57.6	57.6	47.0			
Actuated g/C Ratio	0.24	0.24	0.58	0.58	0.47			
v/c Ratio	0.78	0.56	0.22	0.72	0.78			
Control Delay	48.2	39.2	9.4	18.3	16.9			
Queue Delay	0.0	0.0	0.0	0.0	0.4			
Total Delay	48.2	39.2	9.4	18.3	17.3			
LOS	D	D	A	B	B			
Approach Delay	45.0			17.5	17.3			
Approach LOS	D			B	B			
Queue Length 50th (ft)	198	103	14	174	150			
Queue Length 95th (ft)	272	159	m30	352	m175			
Internal Link Dist (ft)	54			160	357			
Turn Bay Length (ft)			100					
Base Capacity (vph)	495	385	346	1083	850			
Starvation Cap Reductn	0	0	0	0	25			
Spillback Cap Reductn	0	0	0	0	0			
Storage Cap Reductn	0	0	0	0	0			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø2	ø11
Reduced v/c Ratio	0.68	0.49	0.22	0.72	0.80			

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 92 (92%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 24.5	Intersection LOS: C
Intersection Capacity Utilization 61.0%	ICU Level of Service B
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 23: S Union St & E Broad St

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	470	88	90	367	72	50	668	245	229	392	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	175		0	100		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	75			75			75			75		
Right Turn on Red			No			Yes			Yes			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		148			496			437			655	
Travel Time (s)		3.4			11.3			9.9			14.9	
Confl. Peds. (#/hr)	27		50	50		27	62		27	27		62
Confl. Bikes (#/hr)												20
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
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	620	0	100	488	0	56	1014	0	254	470	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		pm+pt	NA	
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	20.0		5.0	20.0		20.0	20.0		5.0	20.0	
Minimum Split (s)	10.0	28.0		10.0	28.0		25.5	25.5		10.0	25.5	
Total Split (s)	10.0	39.0		10.0	39.0		37.0	37.0		14.0	37.0	
Total Split (%)	10.0%	39.0%		10.0%	39.0%		37.0%	37.0%		14.0%	37.0%	
Yellow Time (s)	3.0	3.5		3.0	3.5		3.5	3.5		3.0	3.5	
All-Red Time (s)	2.0	2.5		2.0	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5		-2.0	-1.5	
Total Lost Time (s)	3.5	4.5		3.5	4.5		4.0	4.0		3.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	Min		None	Min		C-Max	C-Max		None	C-Max	
Act Effct Green (s)	42.2	36.0		42.9	38.0		33.0	33.0		45.5	33.0	
Actuated g/C Ratio	0.42	0.36		0.43	0.38		0.33	0.33		0.46	0.33	
v/c Ratio	0.17	0.97		0.54	0.71		0.54	0.90		0.89	0.79	
Control Delay	16.8	62.2		27.5	33.9		42.1	35.4		53.5	41.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	2.3		0.0	0.2	
Total Delay	16.8	62.2		27.5	33.9		42.1	37.7		53.5	42.0	
LOS	B	E		C	C		D	D		D	D	
Approach Delay		59.0			32.9			38.0			46.0	
Approach LOS		E			C			D			D	
Queue Length 50th (ft)	16	~399		36	271		23	182		109	280	
Queue Length 95th (ft)	37	#630		68	#413		m40	#295		#259	#426	
Internal Link Dist (ft)		68			416			357			575	
Turn Bay Length (ft)				175			100			250		
Base Capacity (vph)	282	640		184	683		103	1127		285	597	
Starvation Cap Reductn	0	0		0	0		0	47		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	7	
Storage Cap Reductn	0	0		0	0		0	0		0	0	

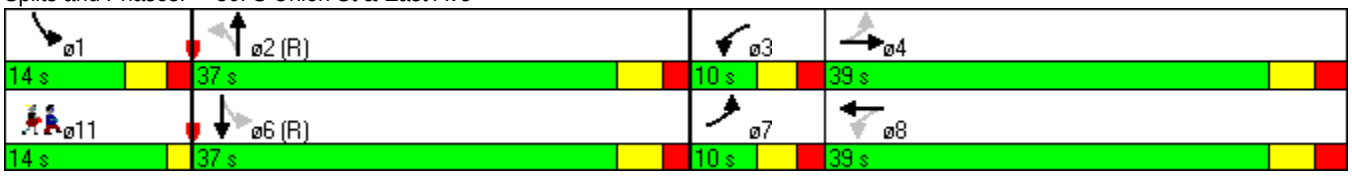
Lane Group	ø11
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	11
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	6.0
Total Split (s)	14.0
Total Split (%)	14%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.17	0.97		0.54	0.71		0.54	0.94		0.89	0.80	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 96 (96%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay: 43.5 Intersection LOS: D
Intersection Capacity Utilization 89.1% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 30: S Union St & East Ave



Lane Group	ø11
Reduced v/c Ratio	

Intersection Summary

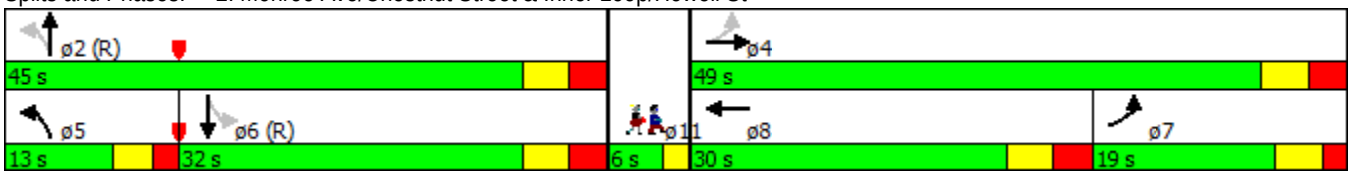
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	229	303	167	0	274	66	168	435	1	56	258	293
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	100		250	250		0	100		0
Storage Lanes	1		0	0		1	1		0	1		1
Taper Length (ft)	75			75			75			75		
Right Turn on Red			Yes			No			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		973			457			741			768	
Travel Time (s)		22.1			10.4			16.8			17.5	
Confl. Peds. (#/hr)	30		30	30		30	22		10	10		22
Confl. Bikes (#/hr)						20						
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
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	241	495	0	0	357	0	177	459	0	59	272	308
Turn Type	pm+pt	NA			NA		pm+pt	NA		Perm	NA	Free
Protected Phases	7	4			8		5	2			6	
Permitted Phases	4						2			6		Free
Detector Phase	7	4			8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0			10.0		7.0	10.0		10.0	10.0	
Minimum Split (s)	10.5	22.5			22.5		12.0	23.5		23.5	23.5	
Total Split (s)	19.0	49.0			30.0		13.0	45.0		32.0	32.0	
Total Split (%)	19.0%	49.0%			30.0%		13.0%	45.0%		32.0%	32.0%	
Yellow Time (s)	3.5	3.5			3.5		3.0	3.5		3.5	3.5	
All-Red Time (s)	2.0	3.0			3.0		2.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.5	-1.5			-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	4.0	5.0			5.0		3.5	5.0		5.0	5.0	
Lead/Lag	Lag				Lead		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes				Yes		Yes			Yes	Yes	
Recall Mode	None	Min			Min		None	C-Max		C-Max	C-Max	
Act Effct Green (s)	37.2	36.2			17.9		55.3	53.8		38.6	38.6	100.0
Actuated g/C Ratio	0.37	0.36			0.18		0.55	0.54		0.39	0.39	1.00
v/c Ratio	0.59	0.82			0.63		0.31	0.46		0.17	0.38	0.20
Control Delay	34.2	38.2			30.0		10.1	13.9		26.6	26.9	0.3
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	34.2	38.2			30.0		10.1	13.9		26.6	26.9	0.3
LOS	C	D			C		B	B		C	C	A
Approach Delay		36.9			30.0			12.8			14.1	
Approach LOS		D			C			B			B	
Queue Length 50th (ft)	110	262			82		66	197		25	125	0
Queue Length 95th (ft)	149	342			125		93	328		66	231	0
Internal Link Dist (ft)		893			377			661			688	
Turn Bay Length (ft)	200						250			100		
Base Capacity (vph)	440	727			798		576	1002		353	718	1554
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

Lane Group	ø11
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	11
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	6.0
Total Split (s)	6.0
Total Split (%)	6%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.55	0.68			0.45		0.31	0.46		0.17	0.38	0.20

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 26 (26%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 23.2	Intersection LOS: C
Intersection Capacity Utilization 72.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: Monroe Ave/Chestnut Street & Inner Loop/Howell St



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø2	ø11
Lane Configurations								
Volume (vph)	81	36	168	653	396	209		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Storage Length (ft)	0	0	100			0		
Storage Lanes	1	1	1			0		
Taper Length (ft)	25		75					
Right Turn on Red		No				No		
Link Speed (mph)	30			30	30			
Link Distance (ft)	134			240	437			
Travel Time (s)	3.0			5.5	9.9			
Confl. Peds. (#/hr)		34	30			30		
Confl. Bikes (#/hr)						20		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90		
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	90	40	187	726	672	0		
Turn Type	NA	Perm	custom	NA	NA			
Protected Phases	4		5	2 5	6		2	11
Permitted Phases		4	2					
Detector Phase	4	4	5	2 5	6			
Switch Phase								
Minimum Initial (s)	10.0	10.0	5.0		20.0		20.0	4.0
Minimum Split (s)	24.5	24.5	10.5		25.5		25.5	6.0
Total Split (s)	25.0	25.0	12.0		57.0		69.0	6.0
Total Split (%)	25.0%	25.0%	12.0%		57.0%		69%	6%
Yellow Time (s)	3.5	3.5	3.5		3.5		3.5	2.0
All-Red Time (s)	2.0	2.0	2.0		2.0		2.0	0.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5		-1.5			
Total Lost Time (s)	4.0	4.0	4.0		4.0			
Lead/Lag			Lag		Lead			
Lead-Lag Optimize?			Yes		Yes			
Recall Mode	None	None	None		C-Max		C-Max	Max
Act Effct Green (s)	13.0	13.0	65.0	65.0	53.0			
Actuated g/C Ratio	0.13	0.13	0.65	0.65	0.53			
v/c Ratio	0.40	0.22	0.50	0.61	0.77			
Control Delay	45.0	41.5	18.7	13.6	13.7			
Queue Delay	0.0	0.0	0.0	0.0	0.3			
Total Delay	45.0	41.5	18.7	13.6	14.0			
LOS	D	D	B	B	B			
Approach Delay	43.9			14.7	14.0			
Approach LOS	D			B	B			
Queue Length 50th (ft)	54	24	51	244	151			
Queue Length 95th (ft)	99	53	84	353	187			
Internal Link Dist (ft)	54			160	357			
Turn Bay Length (ft)			100					
Base Capacity (vph)	364	291	377	1187	878			
Starvation Cap Reductn	0	0	0	0	24			
Spillback Cap Reductn	0	0	0	0	0			
Storage Cap Reductn	0	0	0	0	0			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø2	ø11
Reduced v/c Ratio	0.25	0.14	0.50	0.61	0.79			

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 93 (93%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 16.6	Intersection LOS: B
Intersection Capacity Utilization 67.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 23: S Union St & E Broad St

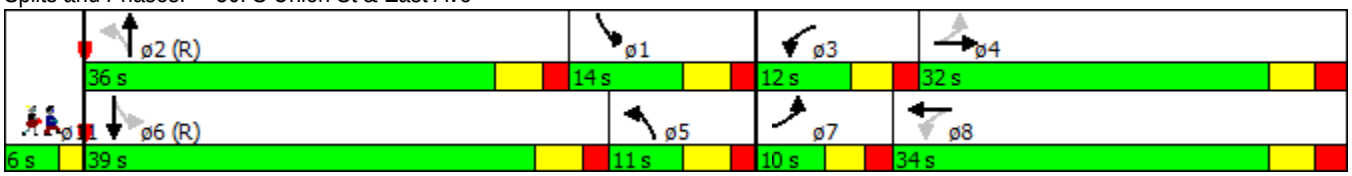
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	191	35	160	331	78	124	532	78	198	410	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	175		0	100		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	75			75			75			75		
Right Turn on Red			No			Yes			Yes			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		148			496			437			655	
Travel Time (s)		3.4			11.3			9.9			14.9	
Confl. Peds. (#/hr)	59		15	15		59	23		29	29		23
Confl. Bikes (#/hr)												20
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
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	5%	5%	5%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	31	251	0	178	455	0	138	678	0	220	494	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	20.0		5.0	20.0		5.0	20.0		5.0	20.0	
Minimum Split (s)	10.0	28.0		10.0	28.0		10.5	25.5		10.5	25.5	
Total Split (s)	10.0	32.0		12.0	34.0		11.0	36.0		14.0	39.0	
Total Split (%)	10.0%	32.0%		12.0%	34.0%		11.0%	36.0%		14.0%	39.0%	
Yellow Time (s)	3.0	3.5		3.0	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.5		2.0	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	3.5	4.5		3.5	4.5		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Min		None	Min		None	C-Max		None	C-Max	
Act Effct Green (s)	32.6	25.1		37.2	31.1		39.0	32.0		45.0	35.0	
Actuated g/C Ratio	0.33	0.25		0.37	0.31		0.39	0.32		0.45	0.35	
v/c Ratio	0.14	0.57		0.51	0.83		0.69	0.63		0.69	0.79	
Control Delay	20.1	37.7		26.7	46.2		40.4	22.8		45.7	41.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	20.1	37.7		26.7	46.2		40.4	22.8		45.7	41.2	
LOS	C	D		C	D		D	C		D	D	
Approach Delay		35.8			40.7			25.8			42.6	
Approach LOS		D			D			C			D	
Queue Length 50th (ft)	12	135		74	268		30	100		106	304	
Queue Length 95th (ft)	30	213		124	#447		m#113	148		#172	#444	
Internal Link Dist (ft)		68			416			357			575	
Turn Bay Length (ft)				175			100			250		
Base Capacity (vph)	217	486		348	550		200	1075		320	626	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	1	
Storage Cap Reductn	0	0		0	0		0	0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.14	0.52		0.51	0.83		0.69	0.63		0.69	0.79	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 35.7 Intersection LOS: D
Intersection Capacity Utilization 71.6% 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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 30: S Union St & East Ave

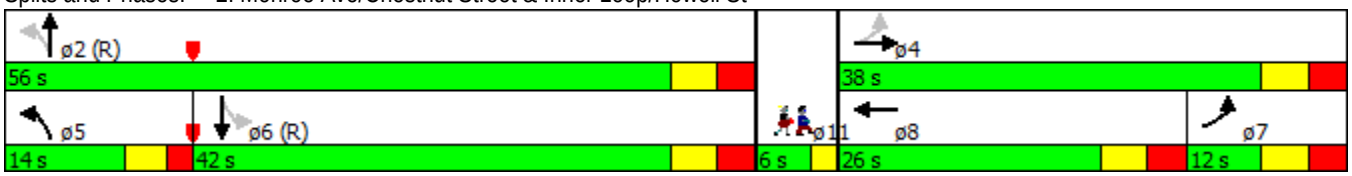


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	94	276	84	0	641	21	263	340	15	31	536	1285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	100		250	250		0	100		0
Storage Lanes	1		0	0		1	1		0	1		1
Taper Length (ft)	75			75			75			75		
Right Turn on Red			Yes			No			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		973			457			741			768	
Travel Time (s)		22.1			10.4			16.8			17.5	
Confl. Peds. (#/hr)	30		30	30		30	14		41	41		
Confl. Bikes (#/hr)						20						
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	99	379	0	0	697	0	277	374	0	33	564	1353
Turn Type	pm+pt	NA			NA		pm+pt	NA		Perm	NA	Free
Protected Phases	7	4			8		5	2			6	
Permitted Phases	4						2			6		Free
Detector Phase	7	4			8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0			10.0		7.0	10.0		10.0	10.0	
Minimum Split (s)	11.5	22.5			22.5		12.0	23.5		23.5	23.5	
Total Split (s)	12.0	38.0			26.0		14.0	56.0		42.0	42.0	
Total Split (%)	12.0%	38.0%			26.0%		14.0%	56.0%		42.0%	42.0%	
Yellow Time (s)	3.5	3.5			3.5		3.0	3.5		3.5	3.5	
All-Red Time (s)	3.0	3.0			3.0		2.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.5	-1.5			-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	5.0	5.0			5.0		3.5	5.0		5.0	5.0	
Lead/Lag	Lag				Lead		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes				Yes		Yes			Yes	Yes	
Recall Mode	None	Min			Min		None	C-Max		C-Max	C-Max	
Act Effct Green (s)	32.0	30.6			21.0		54.9	53.4		38.8	38.8	100.0
Actuated g/C Ratio	0.32	0.31			0.21		0.55	0.53		0.39	0.39	1.00
v/c Ratio	0.50	0.69			0.95		0.86	0.38		0.09	0.78	0.85
Control Delay	43.9	36.1			47.1		48.1	15.9		21.6	36.8	6.6
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	43.9	36.1			47.1		48.1	15.9		21.6	36.8	6.6
LOS	D	D			D		D	B		C	D	A
Approach Delay		37.7			47.1			29.6			15.6	
Approach LOS		D			D			C			B	
Queue Length 50th (ft)	45	196			205		126	120		14	320	0
Queue Length 95th (ft)	83	298			m#325		#254	222		35	#498	0
Internal Link Dist (ft)		893			377			661			688	
Turn Bay Length (ft)	200						250			100		
Base Capacity (vph)	197	588			737		322	984		361	722	1583
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	0.50	0.64			0.95		0.86	0.38		0.09	0.78	0.85

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 26.6	Intersection LOS: C
Intersection Capacity Utilization 82.3%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 2: Monroe Ave/Chestnut Street & Inner Loop/Howell St

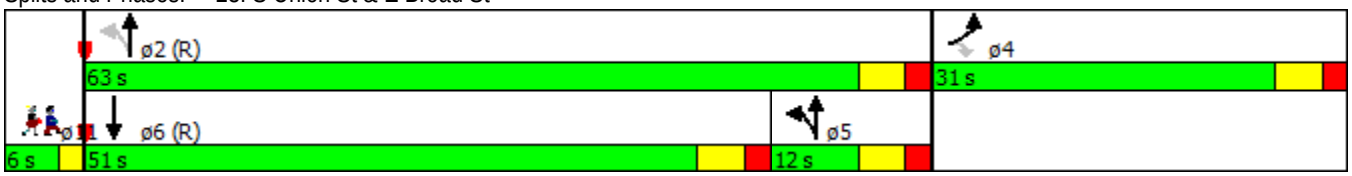


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø2	ø11
Lane Configurations								
Volume (vph)	290	161	65	673	510	60		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Storage Length (ft)	0	0	100			0		
Storage Lanes	1	1	1			0		
Taper Length (ft)	25		75					
Right Turn on Red		No				No		
Link Speed (mph)	30			30	30			
Link Distance (ft)	134			240	437			
Travel Time (s)	3.0			5.5	9.9			
Confl. Peds. (#/hr)		43	30			30		
Confl. Bikes (#/hr)						20		
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86		
Heavy Vehicles (%)	2%	2%	1%	1%	2%	2%		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	337	187	76	783	663	0		
Turn Type	NA	Perm	custom	NA	NA			
Protected Phases	4		5	2 5	6		2	11
Permitted Phases		4	2					
Detector Phase	4	4	5	2 5	6			
Switch Phase								
Minimum Initial (s)	10.0	10.0	5.0		20.0		20.0	4.0
Minimum Split (s)	24.5	24.5	10.5		25.5		25.5	6.0
Total Split (s)	31.0	31.0	12.0		51.0		63.0	6.0
Total Split (%)	31.0%	31.0%	12.0%		51.0%		63%	6%
Yellow Time (s)	3.5	3.5	3.5		3.5		3.5	2.0
All-Red Time (s)	2.0	2.0	2.0		2.0		2.0	0.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5		-1.5			
Total Lost Time (s)	4.0	4.0	4.0		4.0			
Lead/Lag			Lag		Lead			
Lead-Lag Optimize?			Yes		Yes			
Recall Mode	None	None	None		C-Max		C-Max	Max
Act Effct Green (s)	23.9	23.9	59.0	59.0	47.0			
Actuated g/C Ratio	0.24	0.24	0.59	0.59	0.47			
v/c Ratio	0.80	0.57	0.23	0.71	0.78			
Control Delay	50.0	40.1	6.9	10.2	14.6			
Queue Delay	0.0	0.0	0.0	0.3	0.4			
Total Delay	50.0	40.1	6.9	10.5	15.0			
LOS	D	D	A	B	B			
Approach Delay	46.5			10.2	15.0			
Approach LOS	D			B	B			
Queue Length 50th (ft)	198	103	8	182	150			
Queue Length 95th (ft)	277	161	m16	274	m173			
Internal Link Dist (ft)	54			160	357			
Turn Bay Length (ft)			100					
Base Capacity (vph)	477	371	330	1109	850			
Starvation Cap Reductn	0	0	0	0	25			
Spillback Cap Reductn	0	0	0	59	0			
Storage Cap Reductn	0	0	0	0	0			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø2	ø11
Reduced v/c Ratio	0.71	0.50	0.23	0.75	0.80			

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 96 (96%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 21.0	Intersection LOS: C
Intersection Capacity Utilization 61.0%	ICU Level of Service B
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 23: S Union St & E Broad St



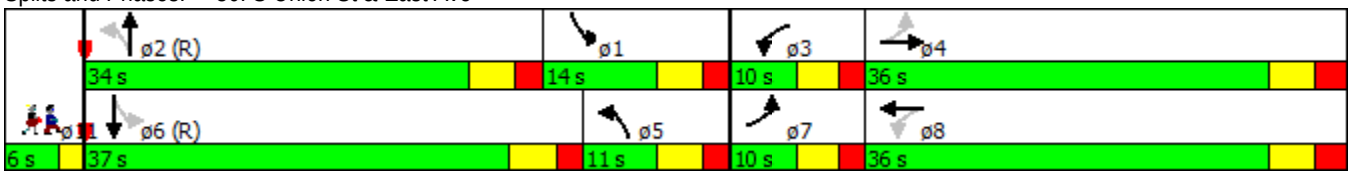
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	470	88	90	367	72	50	668	245	229	392	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	175		0	100		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	75			75			75			75		
Right Turn on Red			No			Yes			Yes			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		148			496			437			655	
Travel Time (s)		3.4			11.3			9.9			14.9	
Confl. Peds. (#/hr)	27		50	50		27	62		27	27		62
Confl. Bikes (#/hr)												20
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
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	620	0	100	488	0	56	1014	0	254	470	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	20.0		5.0	20.0		5.0	20.0		5.0	20.0	
Minimum Split (s)	10.0	28.0		10.0	28.0		10.5	25.5		10.5	25.5	
Total Split (s)	10.0	36.0		10.0	36.0		11.0	34.0		14.0	37.0	
Total Split (%)	10.0%	36.0%		10.0%	36.0%		11.0%	34.0%		14.0%	37.0%	
Yellow Time (s)	3.0	3.5		3.0	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.5		2.0	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	3.5	4.5		3.5	4.5		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Min		None	Min		None	C-Max		None	C-Max	
Act Effct Green (s)	39.7	33.5		40.4	35.5		37.0	30.0		43.2	35.2	
Actuated g/C Ratio	0.40	0.34		0.40	0.36		0.37	0.30		0.43	0.35	
v/c Ratio	0.19	1.04		0.54	0.76		0.27	0.99		0.99	0.74	
Control Delay	18.9	82.8		29.1	38.7		26.0	52.2		95.7	38.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.8		0.0	0.1	
Total Delay	18.9	82.8		29.1	38.7		26.0	53.0		95.7	38.8	
LOS	B	F		C	D		C	D		F	D	
Approach Delay		78.3			37.1			51.6			58.8	
Approach LOS		E			D			D			E	
Queue Length 50th (ft)	17	~453		38	285		22	223		115	280	
Queue Length 95th (ft)	39	#665		71	#465		m29	#463		#273	#426	
Internal Link Dist (ft)		68			416			357			575	
Turn Bay Length (ft)				175			100			250		
Base Capacity (vph)	252	596		184	639		207	1028		256	637	
Starvation Cap Reductn	0	0		0	0		0	4		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	7	
Storage Cap Reductn	0	0		0	0		0	0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.19	1.04		0.54	0.76		0.27	0.99		0.99	0.75	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.04
Intersection Signal Delay: 56.3 Intersection LOS: E
Intersection Capacity Utilization 89.1% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 30: S Union St & East Ave

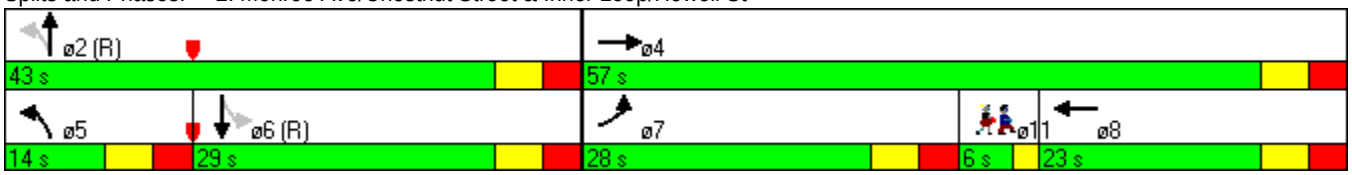


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	229	303	167	0	274	66	168	435	1	56	258	293
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	0		250	250		0	100		0
Storage Lanes	1		0	0		1	1		0	1		1
Taper Length (ft)	75			75			75			75		
Right Turn on Red			Yes			No			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		973			457			741			768	
Travel Time (s)		22.1			10.4			16.8			17.5	
Confl. Peds. (#/hr)	30		30	30		30	22		10	10		22
Confl. Bikes (#/hr)						20						
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
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	241	495	0	0	357	0	177	459	0	59	272	308
Turn Type	Prot	NA			NA		pm+pt	NA		Perm	NA	Free
Protected Phases	7	4			8		5	2			6	
Permitted Phases							2			6		Free
Detector Phase	7	4			8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	10.0			10.0		7.0	10.0		10.0	10.0	
Minimum Split (s)	13.5	22.5			22.5		13.5	23.5		23.5	23.5	
Total Split (s)	28.0	57.0			23.0		14.0	43.0		29.0	29.0	
Total Split (%)	28.0%	57.0%			23.0%		14.0%	43.0%		29.0%	29.0%	
Yellow Time (s)	3.5	3.5			3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.5	-1.5			-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead						Lead			Lag	Lag	
Lead-Lag Optimize?	Yes						Yes			Yes	Yes	
Recall Mode	None	Min			Min		None	C-Max		C-Max	C-Max	
Act Effct Green (s)	19.9	50.6			16.6		39.4	39.4		24.8	24.8	100.0
Actuated g/C Ratio	0.20	0.51			0.17		0.39	0.39		0.25	0.25	1.00
v/c Ratio	0.73	0.60			0.67		0.51	0.63		0.27	0.59	0.20
Control Delay	50.3	19.2			45.8		23.8	24.7		35.2	39.6	0.3
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	50.3	19.2			45.8		23.8	24.7		35.2	39.6	0.3
LOS	D	B			D		C	C		D	D	A
Approach Delay		29.4			45.8			24.4			20.2	
Approach LOS		C			D			C			C	
Queue Length 50th (ft)	143	190			112		51	134		31	155	0
Queue Length 95th (ft)	222	292			160		112	255		69	241	0
Internal Link Dist (ft)		893			377			661			688	
Turn Bay Length (ft)	200						250			100		
Base Capacity (vph)	384	851			574		347	733		215	462	1554
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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.63	0.58			0.62		0.51	0.63		0.27	0.59	0.20

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 28.1	Intersection LOS: C
Intersection Capacity Utilization 72.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: Monroe Ave/Chestnut Street & Inner Loop/Howell St



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø11
Lane Configurations							
Volume (vph)	81	36	168	653	396	209	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0	0	100			0	
Storage Lanes	1	1	1			0	
Taper Length (ft)	25		75				
Right Turn on Red		No				No	
Link Speed (mph)	30			30	30		
Link Distance (ft)	134			240	437		
Travel Time (s)	3.0			5.5	9.9		
Confl. Peds. (#/hr)		34	30			30	
Confl. Bikes (#/hr)						20	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	90	40	187	726	672	0	
Turn Type	NA	Perm	Prot	NA	NA		
Protected Phases	4		5	2	6		11
Permitted Phases		4					
Detector Phase	4	4	5	2	6		
Switch Phase							
Minimum Initial (s)	10.0	10.0	8.0	20.0	20.0		4.0
Minimum Split (s)	24.5	24.5	13.5	25.5	25.5		6.0
Total Split (s)	25.0	25.0	15.0	64.0	44.0		6.0
Total Split (%)	27.8%	27.8%	16.7%	71.1%	48.9%		7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		0.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5		
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		
Lead/Lag			Lead				Lag
Lead-Lag Optimize?			Yes				Yes
Recall Mode	None	None	None	C-Max	C-Max		Max
Act Effct Green (s)	12.6	12.6	16.5	73.3	40.0		
Actuated g/C Ratio	0.14	0.14	0.18	0.81	0.44		
v/c Ratio	0.37	0.21	0.59	0.49	0.91		
Control Delay	39.3	36.3	35.7	4.7	27.4		
Queue Delay	0.0	0.0	0.0	0.0	0.4		
Total Delay	39.3	36.3	35.7	4.7	27.8		
LOS	D	D	D	A	C		
Approach Delay	38.4			11.0	27.8		
Approach LOS	D			B	C		
Queue Length 50th (ft)	48	21	70	70	136		
Queue Length 95th (ft)	90	49	m153	272	m#478		
Internal Link Dist (ft)	54			160	357		
Turn Bay Length (ft)			100				
Base Capacity (vph)	405	326	318	1488	739		
Starvation Cap Reductn	0	0	0	0	5		
Spillback Cap Reductn	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø11
Reduced v/c Ratio	0.22	0.12	0.59	0.49	0.92		

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 88 (98%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 19.7	Intersection LOS: B
Intersection Capacity Utilization 67.2%	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.

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

Splits and Phases: 23: S Union St & E Broad St

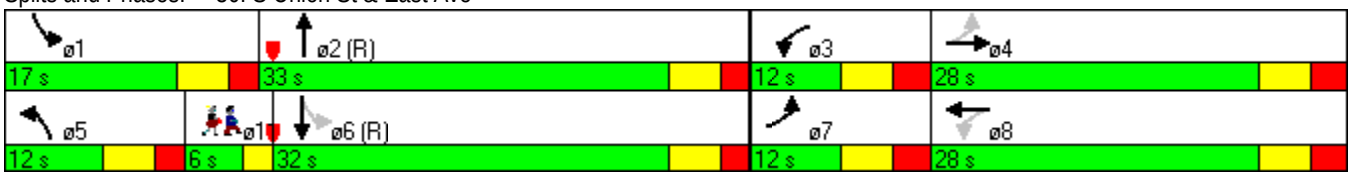
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	191	35	160	331	78	124	532	78	198	410	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	175		0	100		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	75			75			75			75		
Right Turn on Red			No			Yes			Yes			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		148			496			437			655	
Travel Time (s)		3.4			11.3			9.9			14.9	
Confl. Peds. (#/hr)	59		15	15		59	23		29	29		23
Confl. Bikes (#/hr)												20
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
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	5%	5%	5%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	31	251	0	178	455	0	138	678	0	220	494	0
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8						6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	20.0		6.0	20.0		6.0	20.0		6.0	20.0	
Minimum Split (s)	12.0	28.0		12.0	28.0		11.5	25.5		11.5	25.5	
Total Split (s)	12.0	28.0		12.0	28.0		12.0	33.0		17.0	32.0	
Total Split (%)	13.3%	31.1%		13.3%	31.1%		13.3%	36.7%		18.9%	35.6%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead					
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes					
Recall Mode	None	Min		None	Min		None	C-Max		None	C-Max	
Act Effct Green (s)	30.2	22.7		32.0	27.5		8.8	30.8		40.0	28.0	
Actuated g/C Ratio	0.34	0.25		0.36	0.31		0.10	0.34		0.44	0.31	
v/c Ratio	0.13	0.56		0.51	0.84		0.82	0.59		0.58	0.89	
Control Delay	18.4	34.8		25.2	46.1		76.0	22.2		19.2	49.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	5.8	
Total Delay	18.4	34.8		25.2	46.1		76.0	22.2		19.2	55.6	
LOS	B	C		C	D		E	C		B	E	
Approach Delay		33.0			40.2			31.3			44.4	
Approach LOS		C			D			C			D	
Queue Length 50th (ft)	11	123		67	250		69	166		66	265	
Queue Length 95th (ft)	28	199		115	#448		#187	247		110	#448	
Internal Link Dist (ft)		68			416			357			575	
Turn Bay Length (ft)				175			100			250		
Base Capacity (vph)	241	462		348	542		168	1151		397	556	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	36	
Storage Cap Reductn	0	0		0	0		0	0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.13	0.54		0.51	0.84		0.82	0.59		0.55	0.95	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green, Master Intersection
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 37.6 Intersection LOS: D
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.

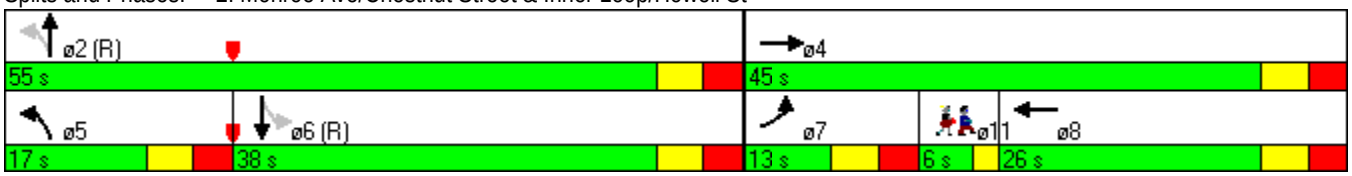
Splits and Phases: 30: S Union St & East Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	94	276	84	0	641	21	263	340	15	31	536	1285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	0		175	250		0	100		0
Storage Lanes	1		0	0		1	1		0	1		1
Taper Length (ft)	75			75			75			75		
Right Turn on Red			Yes			No			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		973			457			741			768	
Travel Time (s)		22.1			10.4			16.8			17.5	
Confl. Peds. (#/hr)	30		30	30		30	14		41	41		
Confl. Bikes (#/hr)						20						
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	99	379	0	0	697	0	277	374	0	33	564	1353
Turn Type	Prot	NA			NA		pm+pt	NA		Perm	NA	Free
Protected Phases	7	4			8		5	2			6	
Permitted Phases							2			6		Free
Detector Phase	7	4			8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	10.0			10.0		7.0	10.0		10.0	10.0	
Minimum Split (s)	10.5	22.5			22.5		13.5	23.5		23.5	23.5	
Total Split (s)	13.0	45.0			26.0		17.0	55.0		38.0	38.0	
Total Split (%)	13.0%	45.0%			26.0%		17.0%	55.0%		38.0%	38.0%	
Yellow Time (s)	3.5	3.5			3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.5	-1.5			-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead						Lead			Lag	Lag	
Lead-Lag Optimize?	Yes						Yes			Yes	Yes	
Recall Mode	None	Min			Min		None	C-Max		C-Max	C-Max	
Act Effct Green (s)	8.0	40.0			21.0		50.0	50.0		33.0	33.0	100.0
Actuated g/C Ratio	0.08	0.40			0.21		0.50	0.50		0.33	0.33	1.00
v/c Ratio	0.70	0.53			0.95		0.97	0.41		0.11	0.92	0.85
Control Delay	71.5	25.1			62.1		74.4	18.6		24.6	54.5	6.6
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	71.5	25.1			62.1		74.4	18.6		24.6	54.5	6.6
LOS	E	C			E		E	B		C	D	A
Approach Delay		34.7			62.1			42.3			20.7	
Approach LOS		C			E			D			C	
Queue Length 50th (ft)	63	172			232		153	126		15	343	0
Queue Length 95th (ft)	#142	262			#346		#297	257		38	#548	0
Internal Link Dist (ft)		893			377			661			688	
Turn Bay Length (ft)	200						250			100		
Base Capacity (vph)	141	711			737		286	922		307	614	1583
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	0.70	0.53			0.95		0.97	0.41		0.11	0.92	0.85

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 33.9	Intersection LOS: C
Intersection Capacity Utilization 83.1%	ICU Level of Service E
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 2: Monroe Ave/Chestnut Street & Inner Loop/Howell St



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø11
Lane Configurations							
Volume (vph)	290	161	65	673	510	60	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0	0	100			0	
Storage Lanes	1	1	1			0	
Taper Length (ft)	25		75				
Right Turn on Red		No				No	
Link Speed (mph)	30			30	30		
Link Distance (ft)	134			240	437		
Travel Time (s)	3.0			5.5	9.9		
Confl. Peds. (#/hr)		43	30			30	
Confl. Bikes (#/hr)						20	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	
Heavy Vehicles (%)	2%	2%	1%	1%	2%	2%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	337	187	76	783	663	0	
Turn Type	NA	Perm	Prot	NA	NA		
Protected Phases	4		5	2	6		11
Permitted Phases		4					
Detector Phase	4	4	5	2	6		
Switch Phase							
Minimum Initial (s)	10.0	10.0	8.0	20.0	20.0		3.0
Minimum Split (s)	24.5	24.5	13.5	25.5	25.5		6.0
Total Split (s)	26.0	26.0	14.0	64.0	44.0		6.0
Total Split (%)	28.9%	28.9%	15.6%	71.1%	48.9%		7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		0.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5		
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		
Lead/Lag			Lead				Lag
Lead-Lag Optimize?			Yes				Yes
Recall Mode	None	None	None	C-Max	C-Max		Max
Act Effct Green (s)	20.8	20.8	9.8	61.2	40.0		
Actuated g/C Ratio	0.23	0.23	0.11	0.68	0.44		
v/c Ratio	0.82	0.58	0.39	0.61	0.82		
Control Delay	50.5	38.4	38.0	12.0	20.0		
Queue Delay	0.0	0.0	0.0	0.0	0.4		
Total Delay	50.5	38.4	38.0	12.0	20.4		
LOS	D	D	D	B	C		
Approach Delay	46.2			14.3	20.4		
Approach LOS	D			B	C		
Queue Length 50th (ft)	179	93	43	232	149		
Queue Length 95th (ft)	#284	153	m69	340	m167		
Internal Link Dist (ft)	54			160	357		
Turn Bay Length (ft)			100				
Base Capacity (vph)	432	340	198	1278	805		
Starvation Cap Reductn	0	0	0	0	16		
Spillback Cap Reductn	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø11
Reduced v/c Ratio	0.78	0.55	0.38	0.61	0.84		

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 82 (91%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 24.5	Intersection LOS: C
Intersection Capacity Utilization 63.5%	ICU Level of Service B
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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

Splits and Phases: 23: S Union St & E Broad St

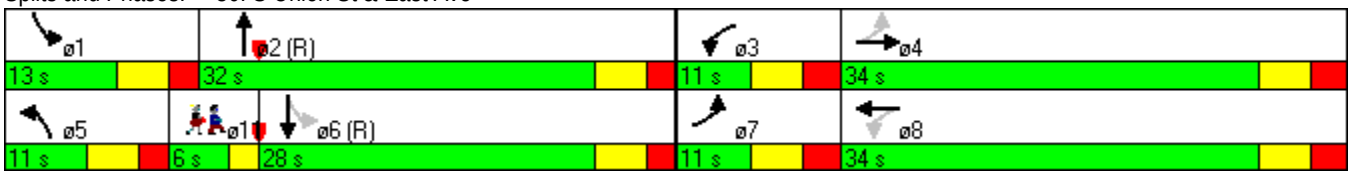
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	470	88	90	367	72	50	668	245	229	392	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	175		0	100		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	75			75			75			75		
Right Turn on Red			No			Yes			Yes			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		148			496			437			655	
Travel Time (s)		3.4			11.3			9.9			14.9	
Confl. Peds. (#/hr)	27		50	50		27	62		27	27		62
Confl. Bikes (#/hr)												20
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
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	620	0	100	488	0	56	1014	0	254	470	0
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8						6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	20.0		5.0	20.0		5.0	20.0		5.0	20.0	
Minimum Split (s)	11.0	28.0		11.0	28.0		10.5	25.5		10.5	25.5	
Total Split (s)	11.0	34.0		11.0	34.0		11.0	32.0		13.0	28.0	
Total Split (%)	12.2%	37.8%		12.2%	37.8%		12.2%	35.6%		14.4%	31.1%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead					
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes					
Recall Mode	None	Min		None	Min		None	C-Max		None	C-Max	
Act Effct Green (s)	36.9	31.7		37.8	33.9		7.0	28.0		33.0	24.0	
Actuated g/C Ratio	0.41	0.35		0.42	0.38		0.08	0.31		0.37	0.27	
v/c Ratio	0.16	0.99		0.50	0.72		0.41	0.95		0.93	0.97	
Control Delay	15.5	65.2		23.6	32.4		47.7	42.8		60.7	69.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.4		0.0	0.0	
Total Delay	15.5	65.2		23.6	32.4		47.7	43.2		60.7	69.4	
LOS	B	E		C	C		D	D		E	E	
Approach Delay		61.7			30.9			43.4			66.3	
Approach LOS		E			C			D			E	
Queue Length 50th (ft)	15	~392		32	248		30	190		89	264	
Queue Length 95th (ft)	34	#596		62	#414		m48	#319		#231	#459	
Internal Link Dist (ft)		68			416			357			575	
Turn Bay Length (ft)				175			100			250		
Base Capacity (vph)	289	628		201	679		137	1071		273	483	
Starvation Cap Reductn	0	0		0	0		0	5		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.16	0.99		0.50	0.72		0.41	0.95		0.93	0.97	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green, Master Intersection
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 50.5 Intersection LOS: D
Intersection Capacity Utilization 89.5% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 30: S Union St & East Ave

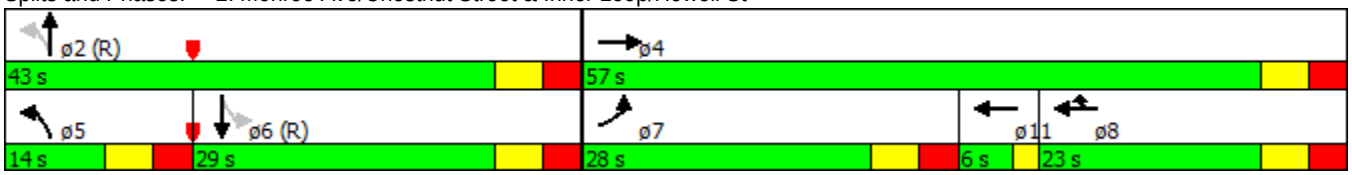


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	229	303	167	0	274	66	168	435	1	56	258	293
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	100		75	250		0	100		0
Storage Lanes	1		0	0		1	1		0	1		1
Taper Length (ft)	75			75			75			75		
Right Turn on Red			Yes			No			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		973			457			741			768	
Travel Time (s)		22.1			10.4			16.8			17.5	
Confl. Peds. (#/hr)	30		30	30		30	22		10	10		22
Confl. Bikes (#/hr)						20						
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
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	241	495	0	0	288	69	177	459	0	59	272	308
Turn Type	Prot	NA			NA	custom	pm+pt	NA		Perm	NA	Free
Protected Phases	7	4			8 11	8	5	2			6	
Permitted Phases							2			6		Free
Detector Phase	7	4			8 11	8	5	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	10.0				10.0	7.0	10.0		10.0	10.0	
Minimum Split (s)	13.5	22.5				22.5	13.5	23.5		23.5	23.5	
Total Split (s)	28.0	57.0				23.0	14.0	43.0		29.0	29.0	
Total Split (%)	28.0%	57.0%				23.0%	14.0%	43.0%		29.0%	29.0%	
Yellow Time (s)	3.5	3.5				3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	3.0	3.0				3.0	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.5	-1.5				-1.5	-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	5.0	5.0				5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead						Lead			Lag	Lag	
Lead-Lag Optimize?	Yes						Yes			Yes	Yes	
Recall Mode	None	Min				Min	None	C-Max		C-Max	C-Max	
Act Effct Green (s)	19.9	47.8			23.0	13.8	42.2	42.2		26.3	26.3	100.0
Actuated g/C Ratio	0.20	0.48			0.23	0.14	0.42	0.42		0.26	0.26	1.00
v/c Ratio	0.73	0.63			0.38	0.33	0.45	0.58		0.24	0.56	0.20
Control Delay	50.3	21.5			34.4	42.6	21.5	22.4		33.7	37.6	0.3
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	50.3	21.5			34.4	42.6	21.5	22.4		33.7	37.6	0.3
LOS	D	C			C	D	C	C		C	D	A
Approach Delay		31.0			36.0			22.2			19.3	
Approach LOS		C			D			C			B	
Queue Length 50th (ft)	143	216			85	41	50	132		30	151	0
Queue Length 95th (ft)	222	292			119	79	112	255		68	241	0
Internal Link Dist (ft)		893			377			661			688	
Turn Bay Length (ft)	200					75	250			100		
Base Capacity (vph)	384	851			907	269	390	785		241	490	1554
Starvation Cap Reductn	0	0			0	0	0	0		0	0	0
Spillback Cap Reductn	0	0			0	0	0	0		0	0	0
Storage Cap Reductn	0	0			0	0	0	0		0	0	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.63	0.58			0.32	0.26	0.45	0.58		0.24	0.56	0.20

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 26.2	Intersection LOS: C
Intersection Capacity Utilization 72.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: Monroe Ave/Chestnut Street & Inner Loop/Howell St



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø11
Lane Configurations							
Volume (vph)	81	36	168	653	396	209	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0	0	100			75	
Storage Lanes	1	1	1			1	
Taper Length (ft)	25		75				
Right Turn on Red		No				No	
Link Speed (mph)	30			30	30		
Link Distance (ft)	134			240	437		
Travel Time (s)	3.0			5.5	9.9		
Confl. Peds. (#/hr)		34	30			30	
Confl. Bikes (#/hr)						20	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	90	40	187	726	440	232	
Turn Type	NA	Perm	Prot	NA	NA	custom	
Protected Phases	4		5	2	6 11	6	11
Permitted Phases		4					
Detector Phase	4	4	5	2	6 11	6	
Switch Phase							
Minimum Initial (s)	10.0	10.0	8.0	20.0		20.0	4.0
Minimum Split (s)	24.5	24.5	13.5	25.5		25.5	6.0
Total Split (s)	25.0	25.0	23.0	65.0		36.0	6.0
Total Split (%)	27.8%	27.8%	25.6%	72.2%		40.0%	7%
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0		2.0	0.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5		-1.5	
Total Lost Time (s)	4.0	4.0	4.0	4.0		4.0	
Lead/Lag			Lead				Lag
Lead-Lag Optimize?			Yes				Yes
Recall Mode	None	None	None	C-Max		C-Max	Max
Act Effct Green (s)	12.6	12.6	16.3	73.3	52.2	32.0	
Actuated g/C Ratio	0.14	0.14	0.18	0.81	0.58	0.36	
v/c Ratio	0.37	0.21	0.59	0.49	0.42	0.42	
Control Delay	39.3	36.3	34.0	5.2	6.3	12.2	
Queue Delay	0.0	0.0	0.0	0.0	0.3	0.0	
Total Delay	39.3	36.3	34.0	5.2	6.6	12.2	
LOS	D	D	C	A	A	B	
Approach Delay	38.4			11.1	8.5		
Approach LOS	D			B	A		
Queue Length 50th (ft)	48	21	76	137	42	39	
Queue Length 95th (ft)	90	49	m134	295	m78	m78	
Internal Link Dist (ft)	54			160	357		
Turn Bay Length (ft)			100			75	
Base Capacity (vph)	405	326	377	1488	1058	552	
Starvation Cap Reductn	0	0	0	0	203	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø11
Reduced v/c Ratio	0.22	0.12	0.50	0.49	0.51	0.42	

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 10 (11%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 12.1	Intersection LOS: B
Intersection Capacity Utilization 54.5%	ICU Level of Service A
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 23: S Union St & E Broad St

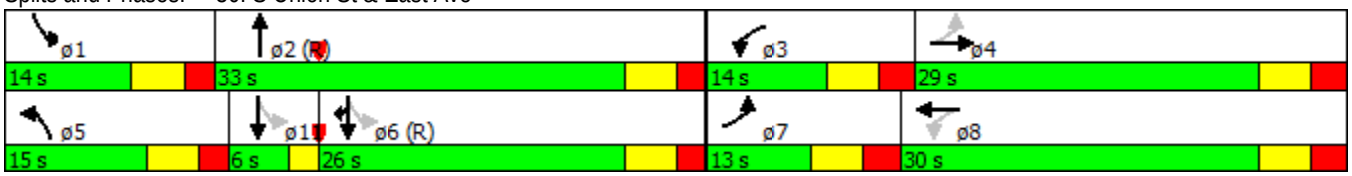
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	191	35	160	331	78	124	532	78	198	410	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	175		0	100		0	250		50
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	75			75			75			75		
Right Turn on Red			No			Yes			Yes			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		148			496			437			655	
Travel Time (s)		3.4			11.3			9.9			14.9	
Confl. Peds. (#/hr)	59		15	15		59	23		29	29		23
Confl. Bikes (#/hr)												20
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
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	5%	5%	5%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	31	251	0	178	455	0	138	678	0	220	456	38
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA		pm+pt	NA	custom
Protected Phases	7	4		3	8		5	2		1	6 11	6
Permitted Phases	4			8						6 11		
Detector Phase	7	4		3	8		5	2		1	6 11	6
Switch Phase												
Minimum Initial (s)	6.0	20.0		6.0	20.0		6.0	20.0		6.0		20.0
Minimum Split (s)	12.0	28.0		12.0	28.0		11.5	25.5		11.5		25.5
Total Split (s)	13.0	29.0		14.0	30.0		15.0	33.0		14.0		26.0
Total Split (%)	14.4%	32.2%		15.6%	33.3%		16.7%	36.7%		15.6%		28.9%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5		3.5
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0		2.0
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5		-1.5		-1.5
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.0	4.0		4.0		4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead					
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes					
Recall Mode	None	Min		None	Min		None	C-Max		None		C-Max
Act Effct Green (s)	31.3	23.3		35.3	29.6		10.9	29.9		39.6	29.3	22.0
Actuated g/C Ratio	0.35	0.26		0.39	0.33		0.12	0.33		0.44	0.33	0.24
v/c Ratio	0.11	0.55		0.46	0.78		0.66	0.61		0.66	0.77	0.10
Control Delay	16.4	33.7		21.2	39.4		59.0	21.1		25.0	38.1	27.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	16.4	33.7		21.2	39.4		59.0	21.1		25.0	38.1	27.3
LOS	B	C		C	D		E	C		C	D	C
Approach Delay		31.8			34.3			27.5			33.5	
Approach LOS		C			C			C			C	
Queue Length 50th (ft)	10	121		63	240		68	177		72	236	17
Queue Length 95th (ft)	26	196		108	#424		#150	107		#130	#389	42
Internal Link Dist (ft)		68			416			357			575	
Turn Bay Length (ft)				175			100			250		50
Base Capacity (vph)	286	482		390	582		215	1118		335	594	379
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.11	0.52		0.46	0.78		0.64	0.61		0.66	0.77	0.10

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green, Master Intersection
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 31.5 Intersection LOS: C
Intersection Capacity Utilization 70.7% 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: 30: S Union St & East Ave



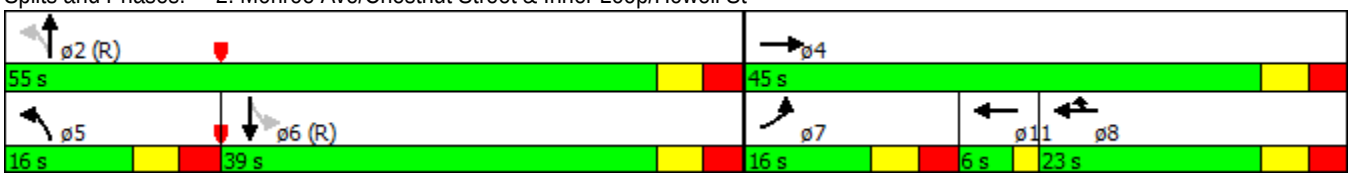
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	94	276	84	0	641	21	263	340	15	31	536	1285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	100		75	250		0	100		0
Storage Lanes	1		0	0		1	1		0	1		1
Taper Length (ft)	75			75			75			75		
Right Turn on Red			Yes			No			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		973			457			741			768	
Travel Time (s)		22.1			10.4			16.8			17.5	
Confl. Peds. (#/hr)	30		30	30		30	14		41	41		
Confl. Bikes (#/hr)						20						
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	99	379	0	0	675	22	277	374	0	33	564	1353
Turn Type	Prot	NA			NA	custom	pm+pt	NA		Perm	NA	Free
Protected Phases	7	4			8 11	8	5	2			6	
Permitted Phases							2			6		Free
Detector Phase	7	4			8 11	8	5	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	10.0				10.0	7.0	10.0		10.0	10.0	
Minimum Split (s)	10.5	22.5				22.5	13.5	23.5		23.5	23.5	
Total Split (s)	16.0	45.0				23.0	16.0	55.0		39.0	39.0	
Total Split (%)	16.0%	45.0%				23.0%	16.0%	55.0%		39.0%	39.0%	
Yellow Time (s)	3.5	3.5				3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	3.0	3.0				3.0	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.5	-1.5				-1.5	-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	5.0	5.0				5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead						Lead			Lag	Lag	
Lead-Lag Optimize?	Yes						Yes			Yes	Yes	
Recall Mode	None	Min				Min	None	C-Max		C-Max	C-Max	
Act Effct Green (s)	10.4	38.7			26.0	16.7	51.3	51.3		34.0	34.0	100.0
Actuated g/C Ratio	0.10	0.39			0.26	0.17	0.51	0.51		0.34	0.34	1.00
v/c Ratio	0.54	0.55			0.74	0.08	0.94	0.40		0.10	0.89	0.85
Control Delay	53.8	25.9			40.2	35.1	68.3	18.4		23.8	49.6	6.6
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	53.8	25.9			40.2	35.1	68.3	18.4		23.8	49.6	6.6
LOS	D	C			D	D	E	B		C	D	A
Approach Delay		31.7			40.1			39.6			19.3	
Approach LOS		C			D			D			B	
Queue Length 50th (ft)	61	172			213	12	~159	124		14	337	0
Queue Length 95th (ft)	113	262			281	34	#301	262		37	#535	0
Internal Link Dist (ft)		893			377			661			688	
Turn Bay Length (ft)	200					75	250			100		
Base Capacity (vph)	194	711			964	284	294	946		316	633	1583
Starvation Cap Reductn	0	0			0	0	0	0		0	0	0
Spillback Cap Reductn	0	0			0	0	0	0		0	0	0
Storage Cap Reductn	0	0			0	0	0	0		0	0	0
Reduced v/c Ratio	0.51	0.53			0.70	0.08	0.94	0.40		0.10	0.89	0.85

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 28.2	Intersection LOS: C
Intersection Capacity Utilization 82.4%	ICU Level of Service E
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Monroe Ave/Chestnut Street & Inner Loop/Howell St



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø11
Lane Configurations							
Volume (vph)	290	161	65	673	510	60	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0	0	100			75	
Storage Lanes	1	1	1			1	
Taper Length (ft)	25		75				
Right Turn on Red		No				No	
Link Speed (mph)	30			30	30		
Link Distance (ft)	134			240	437		
Travel Time (s)	3.0			5.5	9.9		
Confl. Peds. (#/hr)		43	30			30	
Confl. Bikes (#/hr)						20	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	
Heavy Vehicles (%)	2%	2%	1%	1%	2%	2%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	337	187	76	783	593	70	
Turn Type	NA	Perm	Prot	NA	NA	custom	
Protected Phases	4		5	2	6 11	6	11
Permitted Phases		4					
Detector Phase	4	4	5	2	6 11	6	
Switch Phase							
Minimum Initial (s)	10.0	10.0	8.0	20.0		20.0	4.0
Minimum Split (s)	24.5	24.5	13.5	25.5		25.5	6.0
Total Split (s)	30.0	30.0	14.0	60.0		40.0	6.0
Total Split (%)	33.3%	33.3%	15.6%	66.7%		44.4%	7%
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0		2.0	0.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5		-1.5	
Total Lost Time (s)	4.0	4.0	4.0	4.0		4.0	
Lead/Lag			Lead				Lag
Lead-Lag Optimize?			Yes				Yes
Recall Mode	None	None	None	C-Max		C-Max	Max
Act Effct Green (s)	22.5	22.5	9.9	59.5	48.2	36.0	
Actuated g/C Ratio	0.25	0.25	0.11	0.66	0.54	0.40	
v/c Ratio	0.76	0.54	0.39	0.63	0.59	0.11	
Control Delay	42.6	34.5	35.0	14.1	9.3	8.4	
Queue Delay	0.0	0.0	0.0	0.0	0.5	0.0	
Total Delay	42.6	34.5	35.0	14.1	9.8	8.4	
LOS	D	C	D	B	A	A	
Approach Delay	39.7			16.0	9.7		
Approach LOS	D			B	A		
Queue Length 50th (ft)	174	90	36	296	86	10	
Queue Length 95th (ft)	246	143	m64	420	m106	m16	
Internal Link Dist (ft)	54			160	357		
Turn Bay Length (ft)			100			75	
Base Capacity (vph)	511	402	201	1242	998	633	
Starvation Cap Reductn	0	0	0	0	125	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø11
Reduced v/c Ratio	0.66	0.47	0.38	0.63	0.68	0.11	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 6 (7%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 20.0 Intersection LOS: C
Intersection Capacity Utilization 59.6% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: S Union St & E Broad St

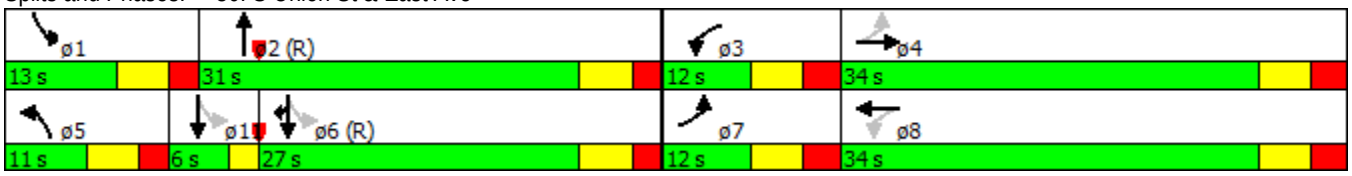
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	470	88	90	367	72	50	668	245	229	392	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	175		0	100		0	250		50
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	75			75			75			75		
Right Turn on Red			No			Yes			Yes			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		148			496			437			655	
Travel Time (s)		3.4			11.3			9.9			14.9	
Confl. Peds. (#/hr)	27		50	50		27	62		27	27		62
Confl. Bikes (#/hr)												20
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
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	620	0	100	488	0	56	1014	0	254	436	34
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA		pm+pt	NA	custom
Protected Phases	7	4		3	8		5	2		1	6 11	6
Permitted Phases	4			8						6 11		
Detector Phase	7	4		3	8		5	2		1	6 11	6
Switch Phase												
Minimum Initial (s)	5.0	20.0		5.0	20.0		5.0	20.0		5.0		20.0
Minimum Split (s)	11.0	28.0		11.0	28.0		10.5	25.5		10.5		25.5
Total Split (s)	12.0	34.0		12.0	34.0		11.0	31.0		13.0		27.0
Total Split (%)	13.3%	37.8%		13.3%	37.8%		12.2%	34.4%		14.4%		30.0%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5		3.5
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0		2.0
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5		-1.5		-1.5
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.0	4.0		4.0		4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead					
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes					
Recall Mode	None	Min		None	Min		None	C-Max		None		C-Max
Act Effct Green (s)	37.9	31.9		38.8	34.3		7.0	27.0		38.4	31.2	23.2
Actuated g/C Ratio	0.42	0.35		0.43	0.38		0.08	0.30		0.43	0.35	0.26
v/c Ratio	0.15	0.98		0.45	0.71		0.41	0.98		0.95	0.67	0.08
Control Delay	14.8	63.6		21.1	31.9		49.2	47.2		66.7	32.4	26.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.2	0.0
Total Delay	14.8	63.6		21.1	31.9		49.2	47.2		66.7	32.6	26.3
LOS	B	E		C	C		D	D		E	C	C
Approach Delay		60.2			30.0			47.3			44.3	
Approach LOS		E			C			D			D	
Queue Length 50th (ft)	14	~392		31	248		33	205		91	218	15
Queue Length 95th (ft)	33	#596		61	#414		m49	#421		#241	329	39
Internal Link Dist (ft)		68			416			357			575	
Turn Bay Length (ft)				175			100			250		50
Base Capacity (vph)	312	632		220	687		137	1034		266	646	408
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	21	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.15	0.98		0.45	0.71		0.41	0.98		0.95	0.70	0.08

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green, Master Intersection
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 46.1 Intersection LOS: D
Intersection Capacity Utilization 89.5% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

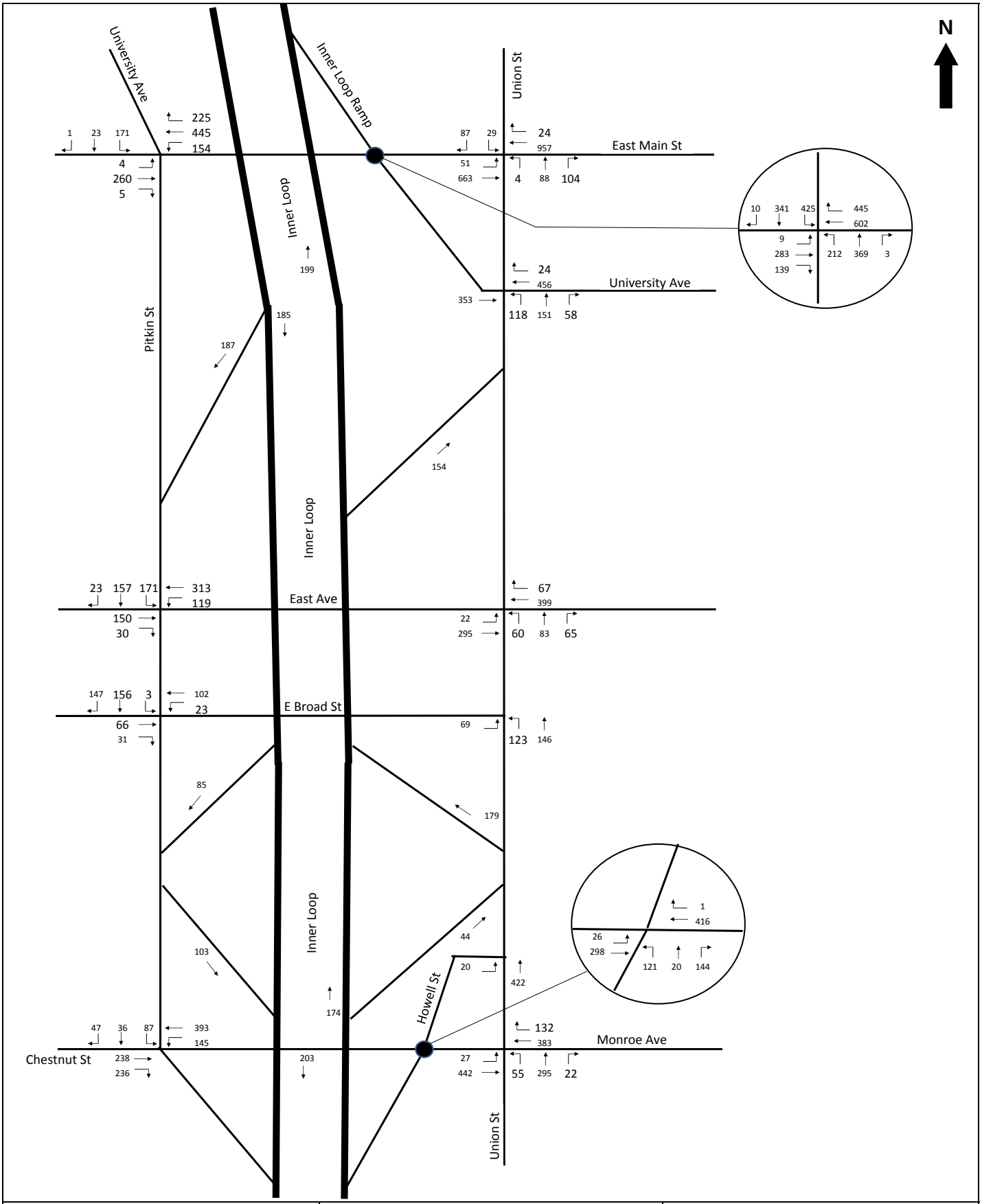
Splits and Phases: 30: S Union St & East Ave



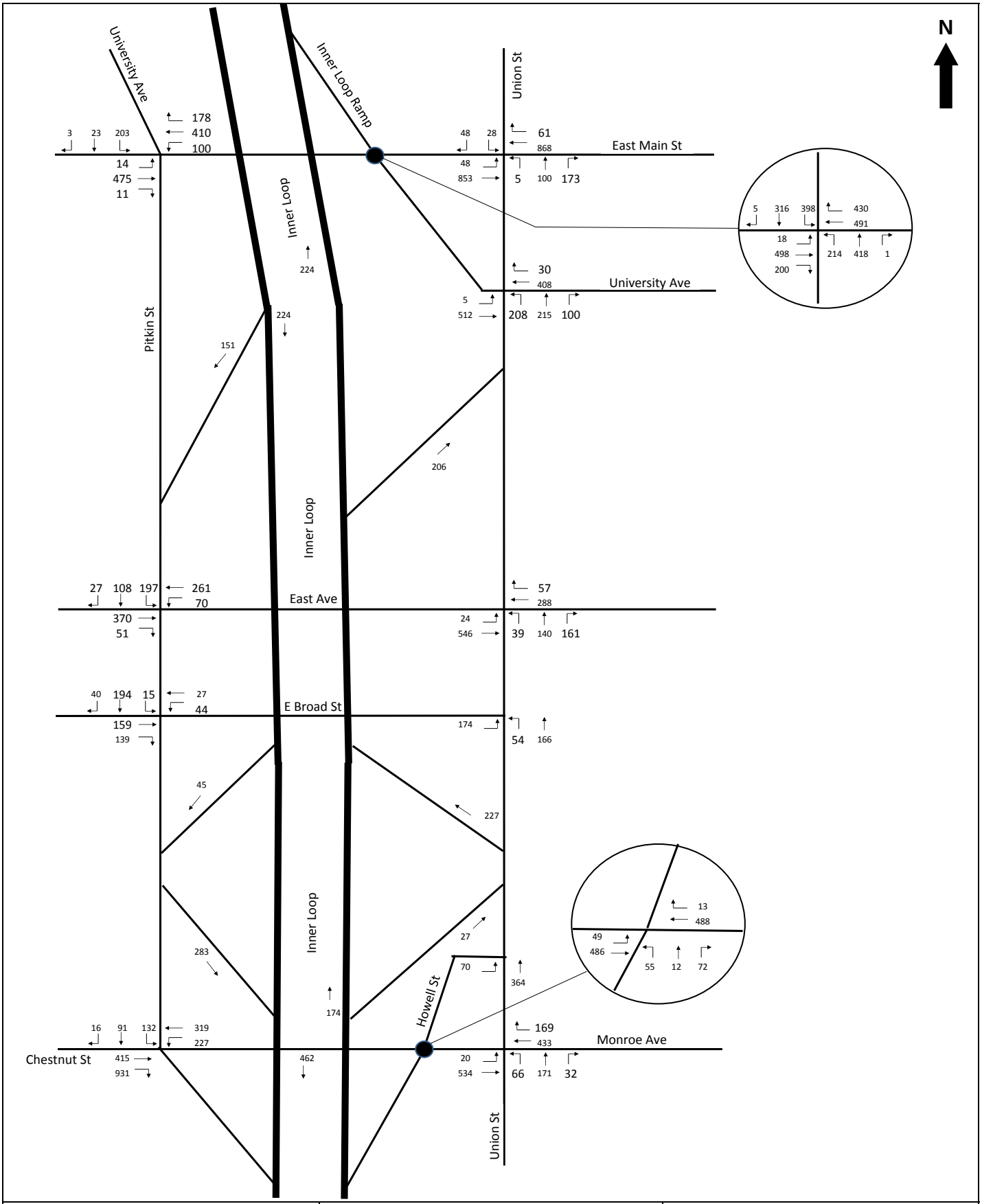
Appendix G – Traffic Analysis
Contents

2008 Existing Conditions

- **2008 Existing Traffic Volumes**
- **2008 Existing Capacity Analysis Printouts**
- **Synchro Files (available upon request)**



Stantec 61 Commercial Street Rochester, New York 14614 T: (585) 475-1440	**ROCHESTER INNER LOOP**	**2008 Existing Traffic Volumes** **AM Peak Hour (7:30 AM - 8:30 AM)**



Stantec 61 Commercial Street Rochester, New York 14614 T: (585) 475-1440	**ROCHESTER INNER LOOP**	**2008 Existing Traffic Volumes** **PM Peak Hour (4:30 AM - 5:30 AM)**

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	121	20	144	0	0	0	26	298	0	0	416	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	0		0	0		50
Storage Lanes	0		1	0		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95
Frt			0.850									
Flt Protected		0.959						0.996				
Satd. Flow (prot)	0	3266	1524	0	0	0	0	3457	0	0	3471	0
Flt Permitted		0.959						0.910				
Satd. Flow (perm)	0	3266	1524	0	0	0	0	3159	0	0	3471	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			180									
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		768			258			177			418	
Travel Time (s)		17.5			5.9			4.0			9.5	
Peak Hour Factor	0.80	0.80	0.80	0.90	0.95	0.90	0.92	0.92	0.92	0.94	0.94	0.94
Heavy Vehicles (%)	6%	6%	6%	2%	2%	2%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	151	25	180	0	0	0	28	324	0	0	443	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	176	180	0	0	0	0	352	0	0	444	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1				1	2			2	
Detector Template	Left		Right				Left	Thru			Thru	
Leading Detector (ft)	20	50	20				20	100			100	
Trailing Detector (ft)	0	0	0				0	0			0	
Detector 1 Position(ft)	0	0	0				0	0			0	
Detector 1 Size(ft)	20	50	20				20	6			6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex				Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0				0.0	0.0			0.0	
Detector 1 Queue (s)	0.0	0.0	0.0				0.0	0.0			0.0	
Detector 1 Delay (s)	0.0	0.0	0.0				0.0	0.0			0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type	Split	NA	Perm				pm+pt	NA			NA	
Protected Phases	2	2					3	1 3			1	
Permitted Phases			2				1 3				1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Detector Phase	2	2	2				3	1 3			1	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0				3.0				3.0	
Minimum Split (s)	32.0	32.0	32.0				25.0				25.0	
Total Split (s)	32.0	32.0	32.0				25.0				28.0	
Total Split (%)	37.6%	37.6%	37.6%				29.4%				32.9%	
Maximum Green (s)	27.0	27.0	27.0				20.0				23.0	
Yellow Time (s)	4.0	4.0	4.0				4.0				4.0	
All-Red Time (s)	1.0	1.0	1.0				1.0				1.0	
Lost Time Adjust (s)		0.0	0.0								0.0	
Total Lost Time (s)		5.0	5.0								5.0	
Lead/Lag	Lag	Lag	Lag								Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0				3.0				3.0	
Recall Mode	Min	Min	Min				None				C-Max	
Walk Time (s)	7.0	7.0	7.0				5.0				5.0	
Flash Dont Walk (s)	18.0	18.0	18.0				15.0				15.0	
Pedestrian Calls (#/hr)	0	0	0				0				0	
Act Effct Green (s)		9.9	9.9					60.1			52.0	
Actuated g/C Ratio		0.12	0.12					0.71			0.61	
v/c Ratio		0.46	0.53					0.16			0.21	
Control Delay		38.6	11.8					3.1			8.2	
Queue Delay		0.0	0.0					0.3			0.0	
Total Delay		38.6	11.8					3.4			8.2	
LOS		D	B					A			A	
Approach Delay		25.0						3.4			8.2	
Approach LOS		C						A			A	

Intersection Summary	
Area Type:	Other
Cycle Length: 85	
Actuated Cycle Length: 85	
Offset: 73 (86%), Referenced to phase 1:NWSE, Start of Green	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 11.9	Intersection LOS: B
Intersection Capacity Utilization 39.7%	ICU Level of Service A
Analysis Period (min) 15	

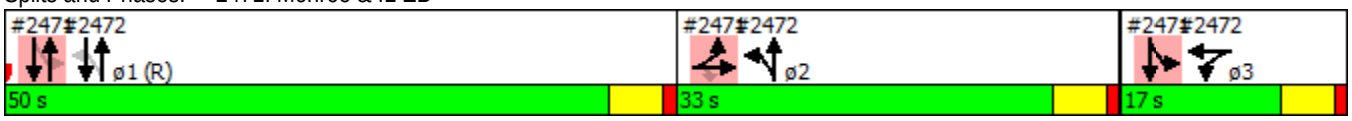
Splits and Phases: 2471: Monroe & IL EB

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	12	72	0	0	0	0	488	13	49	486	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	0		0	0		75	0		0
Storage Lanes	0		1	0		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	1.00
Frt			0.850					0.996				
Flt Protected		0.961									0.995	
Satd. Flow (prot)	0	1808	1599	0	0	0	0	3525	0	0	3522	0
Flt Permitted		0.961									0.866	
Satd. Flow (perm)	0	1808	1599	0	0	0	0	3525	0	0	3065	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			90					3				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		335			316			315			193	
Travel Time (s)		7.6			7.2			7.2			4.4	
Peak Hour Factor	0.80	0.80	0.80	0.95	0.95	0.95	0.95	0.95	0.95	0.90	0.90	0.90
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	69	15	90	0	0	0	0	514	14	54	540	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	84	90	0	0	0	0	528	0	0	594	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1					1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50					50		50	50	
Trailing Detector (ft)	0	0	0					0		0	0	
Detector 1 Position(ft)	0	0	0					0		0	0	
Detector 1 Size(ft)	50	50	50					50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0					0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0					0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0					0.0		0.0	0.0	
Turn Type	Split	NA	Perm					NA		pm+pt	NA	
Protected Phases	2	2						1		3	1 3	
Permitted Phases			2					1		1 3		
Detector Phase	2	2	2					1		3	1 3	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0					7.0		6.0		
Minimum Split (s)	32.0	32.0	32.0					27.0		11.0		
Total Split (s)	33.0	33.0	33.0					50.0		17.0		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	33.0%	33.0%	33.0%					50.0%		17.0%		
Maximum Green (s)	28.0	28.0	28.0					45.0		12.0		
Yellow Time (s)	4.0	4.0	4.0					4.0		4.0		
All-Red Time (s)	1.0	1.0	1.0					1.0		1.0		
Lost Time Adjust (s)		0.0	0.0					0.0				
Total Lost Time (s)		5.0	5.0					5.0				
Lead/Lag	Lag	Lag	Lag					Lead				
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0					2.0		3.0		
Recall Mode	Min	Min	Min					C-Max		None		
Walk Time (s)	7.0	7.0	7.0					7.0				
Flash Dont Walk (s)	18.0	18.0	18.0					15.0				
Pedestrian Calls (#/hr)	0	0	0					0				
Act Effct Green (s)		11.3	11.3					61.7			73.7	
Actuated g/C Ratio		0.11	0.11					0.62			0.74	
v/c Ratio		0.41	0.35					0.24			0.26	
Control Delay		46.0	12.1					8.4			0.8	
Queue Delay		0.0	0.0					0.0			0.2	
Total Delay		46.0	12.1					8.4			1.0	
LOS		D	B					A			A	
Approach Delay		28.4						8.4			1.0	
Approach LOS		C						A			A	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 65 (65%), Referenced to phase 1:NBSB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.44	
Intersection Signal Delay: 7.7	Intersection LOS: A
Intersection Capacity Utilization 46.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2471: Monroe & IL EB



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	0	0	0	87	36	47	0	238	236	145	393	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.91	1.00	0.95	0.88	1.00	1.00	1.00
Frt					0.958				0.850			
Flt Protected					0.975					0.950		
Satd. Flow (prot)	0	0	0	0	4659	0	0	3505	2760	1736	1827	0
Flt Permitted					0.975					0.595		
Satd. Flow (perm)	0	0	0	0	4659	0	0	3505	2760	1087	1827	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					59				251			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		494			239			635			177	
Travel Time (s)		11.2			5.4			14.4			4.0	
Peak Hour Factor	0.90	0.90	0.90	0.80	0.80	0.80	0.94	0.94	0.94	0.88	0.88	0.88
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	4%	4%	4%
Adj. Flow (vph)	0	0	0	109	45	59	0	253	251	165	447	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	213	0	0	253	251	165	447	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		25	15		9
Number of Detectors				1	2			2	1	1	2	
Detector Template				Left	Thru			Thru	Right	Left	Thru	
Leading Detector (ft)				20	100			100	20	20	100	
Trailing Detector (ft)				0	0			0	0	0	0	
Detector 1 Position(ft)				0	0			0	0	0	0	
Detector 1 Size(ft)				20	6			6	20	20	6	
Detector 1 Type				Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0			0.0	0.0	0.0	0.0	
Detector 1 Queue (s)				0.0	0.0			0.0	0.0	0.0	0.0	
Detector 1 Delay (s)				0.0	0.0			0.0	0.0	0.0	0.0	
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Split	NA			NA	Free	pm+pt	NA	
Protected Phases				3	3			1		2	1 2	
Permitted Phases									Free	1 2		
Detector Phase				3	3			1		2	1 2	
Switch Phase												
Minimum Initial (s)				3.0	3.0			3.0		3.0		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Split (s)				25.0	25.0			25.0		25.0		
Total Split (s)				25.0	25.0			25.0		25.0		
Total Split (%)				33.3%	33.3%			33.3%		33.3%		
Maximum Green (s)				20.0	20.0			20.0		20.0		
Yellow Time (s)				3.0	3.0			3.0		3.0		
All-Red Time (s)				2.0	2.0			2.0		2.0		
Lost Time Adjust (s)					0.0			0.0		0.0		
Total Lost Time (s)					5.0			5.0		5.0		
Lead/Lag								Lead		Lag		
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0			3.0		3.0		
Recall Mode				None	None			C-Max		Max		
Walk Time (s)				5.0	5.0			5.0		5.0		
Flash Dont Walk (s)				15.0	15.0			15.0		15.0		
Pedestrian Calls (#/hr)				0	0			0		0		
Act Effct Green (s)					7.9			32.1	75.0	52.1	57.1	
Actuated g/C Ratio					0.11			0.43	1.00	0.69	0.76	
v/c Ratio					0.39			0.17	0.09	0.18	0.32	
Control Delay					24.3			14.0	0.1	3.5	3.7	
Queue Delay					0.0			0.0	0.0	0.9	7.3	
Total Delay					24.3			14.0	0.1	4.3	11.0	
LOS					C			B	A	A	B	
Approach Delay					24.3			7.0			9.2	
Approach LOS					C			A			A	

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 65 (87%), Referenced to phase 1:NWSE, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.39	
Intersection Signal Delay: 10.8	Intersection LOS: B
Intersection Capacity Utilization 33.8%	ICU Level of Service A
Analysis Period (min) 15	

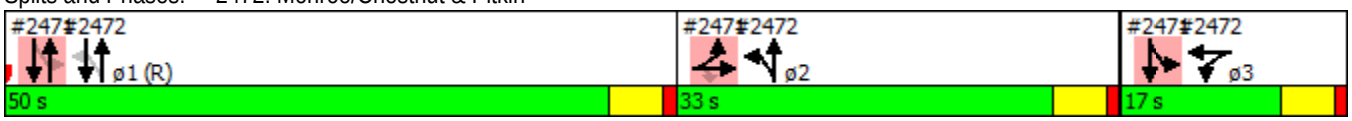
Splits and Phases: 571: Monroe/Chestnut & Pitkin

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	132	91	16	227	319	0	0	415	931
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.91	0.95	0.95	1.00	1.00	0.95	0.88
Frt					0.990							0.850
Flt Protected					0.973			0.980				
Satd. Flow (prot)	0	0	0	0	4899	0	0	3468	0	0	3539	2787
Flt Permitted					0.973			0.648				
Satd. Flow (perm)	0	0	0	0	4899	0	0	2293	0	0	3539	2787
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					9							1023
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		410			1027			193			627	
Travel Time (s)		9.3			23.3			4.4			14.3	
Peak Hour Factor	0.95	0.95	0.95	0.92	0.92	0.92	0.94	0.94	0.94	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	143	99	17	241	339	0	0	456	1023
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	259	0	0	580	0	0	456	1023
Enter Blocked Intersection	No	No	No	No	Yes	No	Yes	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		25
Number of Detectors				1	1		1	1			1	1
Detector Template												
Leading Detector (ft)				50	50		50	50			50	50
Trailing Detector (ft)				0	0		0	0			0	0
Detector 1 Position(ft)				0	0		0	0			0	0
Detector 1 Size(ft)				50	50		50	50			50	50
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0	0.0		0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0	0.0		0.0	0.0			0.0	0.0
Turn Type				Split	NA		pm+pt	NA			NA	Free
Protected Phases				3	3		2	1 2			1	
Permitted Phases							1 2					Free
Detector Phase				3	3		2	1 2			1	
Switch Phase												
Minimum Initial (s)				6.0	6.0		6.0				7.0	
Minimum Split (s)				11.0	11.0		32.0				27.0	
Total Split (s)				17.0	17.0		33.0				50.0	
Total Split (%)				17.0%	17.0%		33.0%				50.0%	
Maximum Green (s)				12.0	12.0		28.0				45.0	
Yellow Time (s)				4.0	4.0		4.0				4.0	
All-Red Time (s)				1.0	1.0		1.0				1.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjust (s)					0.0						0.0	
Total Lost Time (s)					5.0						5.0	
Lead/Lag							Lag				Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0				2.0	
Recall Mode				None	None		Min				C-Max	
Walk Time (s)							7.0				7.0	
Flash Dont Walk (s)							18.0				15.0	
Pedestrian Calls (#/hr)							0				0	
Act Effct Green (s)					12.0			73.0			61.7	100.0
Actuated g/C Ratio					0.12			0.73			0.62	1.00
v/c Ratio					0.44			0.32			0.21	0.37
Control Delay					39.4			2.1			6.9	0.3
Queue Delay					0.0			0.0			0.0	0.0
Total Delay					39.4			2.1			6.9	0.3
LOS					D			A			A	A
Approach Delay					39.4			2.1			2.4	
Approach LOS					D			A			A	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 65 (65%), Referenced to phase 1:NBSB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.44	
Intersection Signal Delay: 6.4	Intersection LOS: A
Intersection Capacity Utilization 46.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2472: Monroe/Chestnut & Pitkin



Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	55	295	22	0	0	0	27	442	0	0	383	132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		250	0		0	0		0	0		50
Storage Lanes	1		0	0		0	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990										0.850
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1752	3470	0	0	0	0	1719	1810	0	0	1827	1553
Flt Permitted	0.950						0.473					
Satd. Flow (perm)	1752	3470	0	0	0	0	856	1810	0	0	1827	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9										113
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		500			568			202			736	
Travel Time (s)		11.4			12.9			4.6			16.7	
Peak Hour Factor	0.90	0.90	0.90	0.95	0.95	0.90	0.85	0.85	0.85	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	5%	5%	5%	4%	4%	4%
Adj. Flow (vph)	61	328	24	0	0	0	32	520	0	0	426	147
Shared Lane Traffic (%)												
Lane Group Flow (vph)	61	352	0	0	0	0	32	520	0	0	426	147
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1					1	2			2	1
Detector Template	Left						Left	Thru			Thru	
Leading Detector (ft)	20	50					20	100			100	50
Trailing Detector (ft)	0	0					0	0			0	0
Detector 1 Position(ft)	0	0					0	0			0	0
Detector 1 Size(ft)	20	50					20	6			6	50
Detector 1 Type	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0					0.0	0.0			0.0	0.0
Detector 1 Queue (s)	0.0	0.0					0.0	0.0			0.0	0.0
Detector 1 Delay (s)	0.0	0.0					0.0	0.0			0.0	0.0
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type	custom	NA					D.Pm	NA			NA	Perm
Protected Phases											4	
Permitted Phases	2	2					4	4				4

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Detector Phase	2	2					4	4			4	4
Switch Phase												
Minimum Initial (s)	9.0	9.0					3.0	3.0			3.0	3.0
Minimum Split (s)	22.0	22.0					25.0	25.0			25.0	25.0
Total Split (s)	28.0	28.0					52.0	52.0			52.0	52.0
Total Split (%)	35.0%	35.0%					65.0%	65.0%			65.0%	65.0%
Maximum Green (s)	23.0	23.0					47.0	47.0			47.0	47.0
Yellow Time (s)	4.0	4.0					5.0	5.0			5.0	5.0
All-Red Time (s)	1.0	1.0					0.0	0.0			0.0	0.0
Lost Time Adjust (s)	0.0	0.0					0.0	0.0			0.0	0.0
Total Lost Time (s)	5.0	5.0					5.0	5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.0					3.0	3.0			3.0	3.0
Recall Mode	None	None					None	None			None	None
Walk Time (s)	7.0	7.0					5.0	5.0			5.0	5.0
Flash Dont Walk (s)	8.0	8.0					15.0	15.0			15.0	15.0
Pedestrian Calls (#/hr)	0	0					0	0			0	0
Act Effct Green (s)	12.1	12.1					23.0	23.0			23.0	23.0
Actuated g/C Ratio	0.26	0.26					0.50	0.50			0.50	0.50
v/c Ratio	0.13	0.38					0.07	0.57			0.47	0.18
Control Delay	17.2	16.9					6.1	10.4			8.9	2.7
Queue Delay	0.0	0.0					0.0	0.0			0.0	0.0
Total Delay	17.2	16.9					6.1	10.4			8.9	2.7
LOS	B	B					A	B			A	A
Approach Delay		16.9						10.2			7.3	
Approach LOS		B						B			A	

Intersection Summary	
Area Type: Other	
Cycle Length: 80	
Actuated Cycle Length: 45.9	
Natural Cycle: 50	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 10.9	Intersection LOS: B
Intersection Capacity Utilization 40.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 246: Union & Monroe

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	534	0	0	433	169	66	171	32	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		50	250		250	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt						0.850		0.976				
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1787	1881	0	0	1881	1599	1752	3421	0	0	0	0
Flt Permitted	0.458						0.950					
Satd. Flow (perm)	862	1881	0	0	1881	1599	1752	3421	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						140		19				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		286			720			700			476	
Travel Time (s)		6.5			16.4			15.9			10.8	
Peak Hour Factor	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	22	580	0	0	498	194	77	199	37	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	580	0	0	498	194	77	236	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1			1	1	1	1				
Detector Template												
Leading Detector (ft)	50	50			50	50	50	50				
Trailing Detector (ft)	0	0			0	0	0	0				
Detector 1 Position(ft)	0	0			0	0	0	0				
Detector 1 Size(ft)	50	50			50	50	50	50				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0	0.0				
Turn Type	Perm	NA			NA	Perm	Split	NA				
Protected Phases		1			1		2	2				
Permitted Phases	1					1						
Detector Phase	1	1			1	1	2	2				
Switch Phase												
Minimum Initial (s)	7.0	7.0			7.0	7.0	9.0	9.0				
Minimum Split (s)	23.0	23.0			23.0	23.0	22.0	22.0				
Total Split (s)	75.0	75.0			75.0	75.0	25.0	25.0				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	75.0%	75.0%			75.0%	75.0%	25.0%	25.0%				
Maximum Green (s)	70.0	70.0			70.0	70.0	20.0	20.0				
Yellow Time (s)	4.0	4.0			4.0	4.0	4.0	4.0				
All-Red Time (s)	1.0	1.0			1.0	1.0	1.0	1.0				
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0	0.0				
Total Lost Time (s)	5.0	5.0			5.0	5.0	5.0	5.0				
Lead/Lag	Lead	Lead			Lead	Lead	Lag	Lag				
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0			2.0	2.0	4.0	4.0				
Recall Mode	C-Max	C-Max			C-Max	C-Max	None	None				
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0				
Flash Dont Walk (s)	11.0	11.0			11.0	11.0	8.0	8.0				
Pedestrian Calls (#/hr)	0	0			0	0	0	0				
Act Effct Green (s)	77.2	77.2			77.2	77.2	12.8	12.8				
Actuated g/C Ratio	0.77	0.77			0.77	0.77	0.13	0.13				
v/c Ratio	0.03	0.40			0.34	0.15	0.35	0.52				
Control Delay	4.5	8.0			2.1	0.4	43.2	41.1				
Queue Delay	0.0	0.3			0.0	0.0	0.0	0.0				
Total Delay	4.5	8.3			2.1	0.4	43.2	41.1				
LOS	A	A			A	A	D	D				
Approach Delay		8.1			1.6			41.6				
Approach LOS		A			A			D				

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 97 (97%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.52	
Intersection Signal Delay: 11.8	Intersection LOS: B
Intersection Capacity Utilization 43.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 246: Union & Monroe

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø2
Lane Configurations							
Volume (vph)	69	0	123	146	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0	0	200			0	
Storage Lanes	2	0	1			0	
Taper Length (ft)	25		25				
Lane Util. Factor	0.97	1.00	1.00	0.95	1.00	1.00	
Frt							
Flt Protected	0.950		0.950				
Satd. Flow (prot)	3367	0	1770	3539	0	0	
Flt Permitted	0.950		0.950				
Satd. Flow (perm)	3367	0	1770	3539	0	0	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)							
Link Speed (mph)	30			30	30		
Link Distance (ft)	136			556	451		
Travel Time (s)	3.1			12.6	10.3		
Peak Hour Factor	0.90	0.90	0.95	0.95	0.90	0.90	
Heavy Vehicles (%)	4%	4%	2%	2%	2%	2%	
Adj. Flow (vph)	77	0	129	154	0	0	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	77	0	129	154	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	24			12	12		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9	15			9	
Number of Detectors	1		1	1			
Detector Template							
Leading Detector (ft)	50		50	50			
Trailing Detector (ft)	0		0	0			
Detector 1 Position(ft)	0		0	0			
Detector 1 Size(ft)	50		50	50			
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex			
Detector 1 Channel							
Detector 1 Extend (s)	0.0		0.0	0.0			
Detector 1 Queue (s)	0.0		0.0	0.0			
Detector 1 Delay (s)	0.0		0.0	0.0			
Turn Type	Prot		Prot	NA			
Protected Phases	1		3	2 3			2
Permitted Phases							
Detector Phase	1		3	2 3			
Switch Phase							
Minimum Initial (s)	7.0		6.0				10.0
Minimum Split (s)	21.0		24.0				28.0
Total Split (s)	22.0		39.0				39.0

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø2
Total Split (%)	22.0%		39.0%				39%
Maximum Green (s)	16.0		34.0				34.0
Yellow Time (s)	4.0		4.0				4.0
All-Red Time (s)	2.0		1.0				1.0
Lost Time Adjust (s)	0.0		0.0				
Total Lost Time (s)	6.0		5.0				
Lead/Lag	Lead						Lag
Lead-Lag Optimize?							
Vehicle Extension (s)	2.0		4.0				3.0
Recall Mode	C-Max		None				None
Walk Time (s)	7.0						7.0
Flash Dont Walk (s)	8.0						15.0
Pedestrian Calls (#/hr)	0						0
Act Effct Green (s)	58.7		14.1	30.3			
Actuated g/C Ratio	0.59		0.14	0.30			
v/c Ratio	0.04		0.52	0.14			
Control Delay	1.5		46.2	24.4			
Queue Delay	0.4		0.0	0.0			
Total Delay	1.9		46.2	24.4			
LOS	A		D	C			
Approach Delay	1.9			34.3			
Approach LOS	A			C			

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 54 (54%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay: 27.4	Intersection LOS: C
Intersection Capacity Utilization 23.3%	ICU Level of Service A
Analysis Period (min) 15	

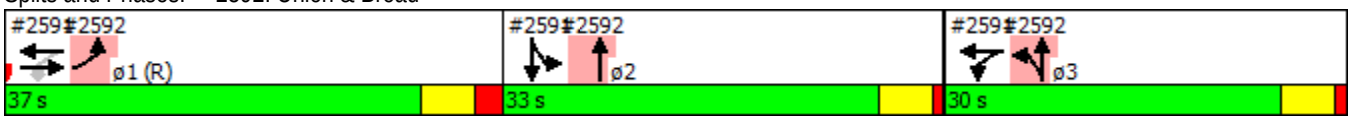
Splits and Phases: 2592: Union & Broad

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø2
Lane Configurations							
Volume (vph)	174	0	54	166	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0	0	200			0	
Storage Lanes	2	0	1			0	
Taper Length (ft)	25		25				
Lane Util. Factor	0.97	1.00	1.00	0.95	1.00	1.00	
Frt							
Flt Protected	0.950		0.950				
Satd. Flow (prot)	3433	0	1787	3574	0	0	
Flt Permitted	0.950		0.950				
Satd. Flow (perm)	3433	0	1787	3574	0	0	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)							
Link Speed (mph)	30			30	30		
Link Distance (ft)	175			499	451		
Travel Time (s)	4.0			11.3	10.3		
Peak Hour Factor	0.88	0.88	0.86	0.86	0.90	0.90	
Heavy Vehicles (%)	2%	2%	1%	1%	2%	2%	
Adj. Flow (vph)	198	0	63	193	0	0	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	198	0	63	193	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	24			12	12		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9	15			9	
Number of Detectors	1		1	1			
Detector Template							
Leading Detector (ft)	50		50	50			
Trailing Detector (ft)	0		0	0			
Detector 1 Position(ft)	0		0	0			
Detector 1 Size(ft)	50		50	50			
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex			
Detector 1 Channel							
Detector 1 Extend (s)	0.0		0.0	0.0			
Detector 1 Queue (s)	0.0		0.0	0.0			
Detector 1 Delay (s)	0.0		0.0	0.0			
Turn Type	Prot		Prot	NA			
Protected Phases	1		3	2 3			2
Permitted Phases							
Detector Phase	1		3	2 3			
Switch Phase							
Minimum Initial (s)	7.0		6.0				10.0
Minimum Split (s)	21.0		24.0				28.0
Total Split (s)	37.0		30.0				33.0

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø2
Total Split (%)	37.0%		30.0%				33%
Maximum Green (s)	31.0		25.0				28.0
Yellow Time (s)	4.0		4.0				4.0
All-Red Time (s)	2.0		1.0				1.0
Lost Time Adjust (s)	0.0		0.0				
Total Lost Time (s)	6.0		5.0				
Lead/Lag	Lead						Lag
Lead-Lag Optimize?							
Vehicle Extension (s)	2.0		4.0				3.0
Recall Mode	C-Max		None				None
Walk Time (s)	7.0						7.0
Flash Dont Walk (s)	8.0						15.0
Pedestrian Calls (#/hr)	0						0
Act Effct Green (s)	62.6		10.1	26.4			
Actuated g/C Ratio	0.63		0.10	0.26			
v/c Ratio	0.09		0.35	0.20			
Control Delay	2.8		50.8	31.7			
Queue Delay	0.4		0.0	0.0			
Total Delay	3.3		50.8	31.7			
LOS	A		D	C			
Approach Delay	3.3			36.4			
Approach LOS	A			D			

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 25 (25%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 22.0	Intersection LOS: C
Intersection Capacity Utilization 23.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2592: Union & Broad



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	66	31	23	102	0	0	0	0	3	156	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.91	0.91	0.91
Frt			0.850								0.928	
Flt Protected					0.991						0.999	
Satd. Flow (prot)	0	3471	1553	0	3507	0	0	0	0	0	4714	0
Flt Permitted					0.914						0.999	
Satd. Flow (perm)	0	3471	1553	0	3235	0	0	0	0	0	4714	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			76								179	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		786			136			477			435	
Travel Time (s)		17.9			3.1			10.8			9.9	
Peak Hour Factor	0.79	0.79	0.79	0.85	0.85	0.85	0.90	0.90	0.90	0.82	0.82	0.82
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	84	39	27	120	0	0	0	0	4	190	179
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	84	39	0	147	0	0	0	0	0	373	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		1	1	1	1					1	1	
Detector Template												
Leading Detector (ft)		50	50	50	50					50	50	
Trailing Detector (ft)		0	0	0	0					0	0	
Detector 1 Position(ft)		0	0	0	0					0	0	
Detector 1 Size(ft)		50	50	50	50					50	50	
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Turn Type		NA	Perm	D.P+P	NA					Split	NA	
Protected Phases		1		3	1 3					2	2	
Permitted Phases			1	1								
Detector Phase		1	1	3	1 3					2	2	
Switch Phase												
Minimum Initial (s)		7.0	7.0	6.0						10.0	10.0	
Minimum Split (s)		21.0	21.0	24.0						28.0	28.0	
Total Split (s)		22.0	22.0	39.0						39.0	39.0	
Total Split (%)		22.0%	22.0%	39.0%						39.0%	39.0%	
Maximum Green (s)		16.0	16.0	34.0						34.0	34.0	
Yellow Time (s)		4.0	4.0	4.0						4.0	4.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)		2.0	2.0	1.0						1.0	1.0	
Lost Time Adjust (s)		0.0	0.0								0.0	
Total Lost Time (s)		6.0	6.0								5.0	
Lead/Lag		Lead	Lead							Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0	4.0						3.0	3.0	
Recall Mode		C-Max	C-Max	None						None	None	
Walk Time (s)		7.0	7.0							7.0	7.0	
Flash Dont Walk (s)		8.0	8.0							15.0	15.0	
Pedestrian Calls (#/hr)		0	0							0	0	
Act Effct Green (s)		58.7	58.7		71.9						11.1	
Actuated g/C Ratio		0.59	0.59		0.72						0.11	
v/c Ratio		0.04	0.04		0.06						0.55	
Control Delay		5.0	1.8		0.5						12.1	
Queue Delay		0.0	0.0		0.2						0.0	
Total Delay		5.0	1.8		0.7						12.1	
LOS		A	A		A						B	
Approach Delay		4.0			0.7						12.1	
Approach LOS		A			A						B	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 54 (54%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay: 8.0	Intersection LOS: A
Intersection Capacity Utilization 34.2%	ICU Level of Service A
Analysis Period (min) 15	

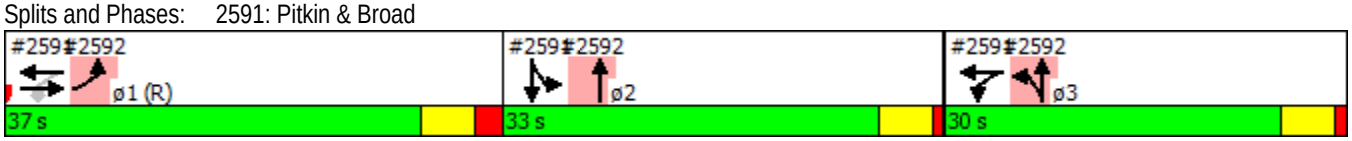
Splits and Phases: 2591: Pitkin & Broad

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	159	139	44	27	0	0	0	0	15	194	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	0.91	0.91	1.00	1.00	1.00	1.00	0.91	0.91	0.91
Frt			0.850								0.976	
Flt Protected					0.970						0.997	
Satd. Flow (prot)	0	3539	1583	0	4933	0	0	0	0	0	4948	0
Flt Permitted					0.781						0.997	
Satd. Flow (perm)	0	3539	1583	0	3972	0	0	0	0	0	4948	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			181								40	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		750			175			248			439	
Travel Time (s)		17.0			4.0			5.6			10.0	
Peak Hour Factor	0.77	0.77	0.77	0.75	0.75	0.75	0.90	0.90	0.90	0.82	0.82	0.82
Adj. Flow (vph)	0	206	181	59	36	0	0	0	0	18	237	49
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	206	181	0	95	0	0	0	0	0	304	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		1	1	1	1					1	1	
Detector Template												
Leading Detector (ft)		50	50	50	50					50	50	
Trailing Detector (ft)		0	0	0	0					0	0	
Detector 1 Position(ft)		0	0	0	0					0	0	
Detector 1 Size(ft)		50	50	50	50					50	50	
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Turn Type		NA	Perm	D.P+P	NA					Split	NA	
Protected Phases		1		3	1 3					2	2	
Permitted Phases			1	1								
Detector Phase		1	1	3	1 3					2	2	
Switch Phase												
Minimum Initial (s)		7.0	7.0	6.0						10.0	10.0	
Minimum Split (s)		21.0	21.0	24.0						28.0	28.0	
Total Split (s)		37.0	37.0	30.0						33.0	33.0	
Total Split (%)		37.0%	37.0%	30.0%						33.0%	33.0%	
Maximum Green (s)		31.0	31.0	25.0						28.0	28.0	
Yellow Time (s)		4.0	4.0	4.0						4.0	4.0	
All-Red Time (s)		2.0	2.0	1.0						1.0	1.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjust (s)		0.0	0.0								0.0	
Total Lost Time (s)		6.0	6.0								5.0	
Lead/Lag		Lead	Lead							Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0	4.0						3.0	3.0	
Recall Mode		C-Max	C-Max	None						None	None	
Walk Time (s)		7.0	7.0							7.0	7.0	
Flash Dont Walk (s)		8.0	8.0							15.0	15.0	
Pedestrian Calls (#/hr)		0	0							0	0	
Act Effct Green (s)		62.6	62.6		71.6						11.4	
Actuated g/C Ratio		0.63	0.63		0.72						0.11	
v/c Ratio		0.09	0.17		0.03						0.51	
Control Delay		4.2	0.3		1.1						34.8	
Queue Delay		0.0	0.0		0.0						0.0	
Total Delay		4.2	0.3		1.1						34.8	
LOS		A	A		A						C	
Approach Delay		2.4			1.1						34.8	
Approach LOS		A			A						C	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 25 (25%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 14.8	Intersection LOS: B
Intersection Capacity Utilization 36.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2591: Pitkin & Broad

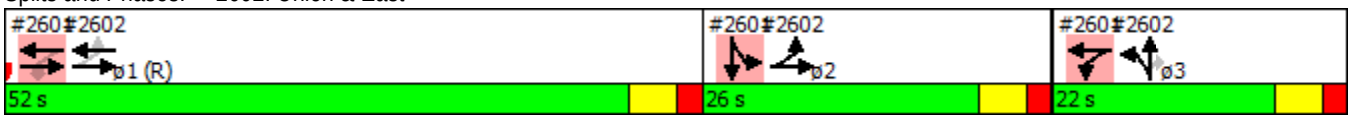


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	295	0	0	399	67	60	83	65	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Frt					0.978				0.850			
Flt Protected		0.997						0.979				
Satd. Flow (prot)	0	3461	0	0	3395	0	0	3366	1538	0	0	0
Flt Permitted		0.913						0.979				
Satd. Flow (perm)	0	3169	0	0	3395	0	0	3366	1538	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					25				87			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		123			667			451			780	
Travel Time (s)		2.8			15.2			10.3			17.7	
Peak Hour Factor	0.76	0.76	0.76	0.93	0.93	0.93	0.94	0.94	0.94	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	5%	5%	5%	2%	2%	2%
Adj. Flow (vph)	29	388	0	0	429	72	64	88	69	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	417	0	0	501	0	0	152	69	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1			1		1	1	1			
Detector Template												
Leading Detector (ft)	50	50			50		50	50	50			
Trailing Detector (ft)	0	0			0		0	0	0			
Detector 1 Position(ft)	0	0			0		0	0	0			
Detector 1 Size(ft)	50	50			50		50	50	50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Turn Type	pm+pt	NA			NA		Split	NA	Perm			
Protected Phases	2	1 2			1		3	3				
Permitted Phases	1 2								3			
Detector Phase	2	1 2			1		3	3	3			
Switch Phase												
Minimum Initial (s)	6.0				6.0		6.0	6.0	6.0			
Minimum Split (s)	23.0				23.0		22.0	22.0	22.0			
Total Split (s)	26.0				52.0		22.0	22.0	22.0			
Total Split (%)	26.0%				52.0%		22.0%	22.0%	22.0%			
Maximum Green (s)	20.5				46.5		16.5	16.5	16.5			
Yellow Time (s)	3.5				3.5		3.5	3.5	3.5			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.0				2.0		2.0	2.0	2.0			
Lost Time Adjust (s)					0.0			0.0	0.0			
Total Lost Time (s)					5.5			5.5	5.5			
Lead/Lag	Lag				Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				2.0		3.0	3.0	3.0			
Recall Mode	None				C-Max		None	None	None			
Walk Time (s)	7.0				7.0		7.0	7.0	7.0			
Flash Dont Walk (s)	9.0				10.0		9.0	9.0	9.0			
Pedestrian Calls (#/hr)	0				0		0	0	0			
Act Effct Green (s)		72.7			55.3			10.8	10.8			
Actuated g/C Ratio		0.73			0.55			0.11	0.11			
v/c Ratio		0.18			0.27			0.42	0.28			
Control Delay		1.0			5.6			34.9	9.1			
Queue Delay		0.5			0.0			0.0	0.0			
Total Delay		1.5			5.6			34.9	9.1			
LOS		A			A			C	A			
Approach Delay		1.5			5.6			26.9				
Approach LOS		A			A			C				

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 16 (16%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 8.2	Intersection LOS: A
Intersection Capacity Utilization 39.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2602: Union & East



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	546	0	0	288	57	39	140	161	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Frt					0.975				0.850			
Flt Protected		0.998						0.989				
Satd. Flow (prot)	0	3532	0	0	3417	0	0	3500	1583	0	0	0
Flt Permitted		0.935						0.989				
Satd. Flow (perm)	0	3309	0	0	3417	0	0	3500	1583	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					24				179			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		148			667			451			567	
Travel Time (s)		3.4			15.2			10.3			12.9	
Peak Hour Factor	0.86	0.86	0.86	0.87	0.87	0.87	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	28	635	0	0	331	66	43	156	179	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	663	0	0	397	0	0	199	179	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1			1		1	1	1			
Detector Template												
Leading Detector (ft)	50	50			50		50	50	50			
Trailing Detector (ft)	0	0			0		0	0	0			
Detector 1 Position(ft)	0	0			0		0	0	0			
Detector 1 Size(ft)	50	50			50		50	50	50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Turn Type	pm+pt	NA			NA		Split	NA	Perm			
Protected Phases	2	1 2			1		3	3				
Permitted Phases	1 2								3			
Detector Phase	2	1 2			1		3	3	3			
Switch Phase												
Minimum Initial (s)	6.0				6.0		6.0	6.0	6.0			
Minimum Split (s)	23.0				23.0		22.0	22.0	22.0			
Total Split (s)	34.0				35.0		31.0	31.0	31.0			
Total Split (%)	34.0%				35.0%		31.0%	31.0%	31.0%			
Maximum Green (s)	28.5				29.5		25.5	25.5	25.5			
Yellow Time (s)	3.5				3.5		3.5	3.5	3.5			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.0				2.0		2.0	2.0	2.0			
Lost Time Adjust (s)					0.0			0.0	0.0			
Total Lost Time (s)					5.5			5.5	5.5			
Lead/Lag	Lag				Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				2.0		3.0	3.0	3.0			
Recall Mode	None				C-Max		None	None	None			
Walk Time (s)	7.0				7.0		7.0	7.0	7.0			
Flash Dont Walk (s)	9.0				10.0		9.0	9.0	9.0			
Pedestrian Calls (#/hr)	0				0		0	0	0			
Act Effct Green (s)		71.4			51.0			12.1	12.1			
Actuated g/C Ratio		0.71			0.51			0.12	0.12			
v/c Ratio		0.28			0.23			0.47	0.51			
Control Delay		0.9			23.3			47.9	17.7			
Queue Delay		0.2			0.0			0.0	0.0			
Total Delay		1.1			23.3			47.9	17.7			
LOS		A			C			D	B			
Approach Delay		1.1			23.3			33.6				
Approach LOS		A			C			C				

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 94 (94%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 15.8	Intersection LOS: B
Intersection Capacity Utilization 44.3%	ICU Level of Service A
Analysis Period (min) 15	

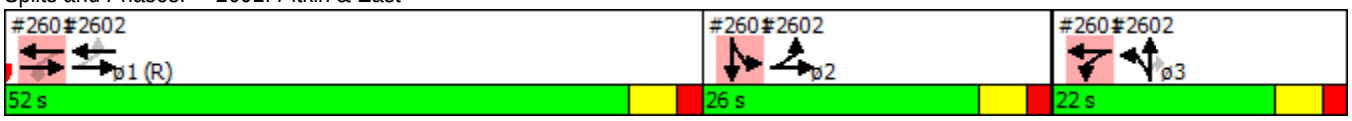
Splits and Phases: 2602: Union & East

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	150	30	119	313	0	0	0	0	171	157	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		125	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt			0.850								0.981	
Flt Protected					0.986					0.950		
Satd. Flow (prot)	0	3471	1553	0	3423	0	0	0	0	1736	3405	0
Flt Permitted					0.811					0.950		
Satd. Flow (perm)	0	3471	1553	0	2815	0	0	0	0	1736	3405	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			87								15	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		788			123			435			516	
Travel Time (s)		17.9			2.8			9.9			11.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.90	0.90	0.90	0.80	0.80	0.80
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	2%	2%	2%	4%	4%	4%
Adj. Flow (vph)	0	158	32	125	329	0	0	0	0	214	196	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	158	32	0	454	0	0	0	0	214	225	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		1	1	1	1					1	1	
Detector Template												
Leading Detector (ft)		50	50	50	50					50	50	
Trailing Detector (ft)		0	0	0	0					0	0	
Detector 1 Position(ft)		0	0	0	0					0	0	
Detector 1 Size(ft)		50	50	50	50					50	50	
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Turn Type		NA	Perm	pm+pt	NA					Split	NA	
Protected Phases		1		3	1 3					2	2	
Permitted Phases			1	1 3								
Detector Phase		1	1	3	1 3					2	2	
Switch Phase												
Minimum Initial (s)		6.0	6.0	6.0						6.0	6.0	
Minimum Split (s)		23.0	23.0	22.0						23.0	23.0	
Total Split (s)		52.0	52.0	22.0						26.0	26.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)		52.0%	52.0%	22.0%						26.0%	26.0%	
Maximum Green (s)		46.5	46.5	16.5						20.5	20.5	
Yellow Time (s)		3.5	3.5	3.5						3.5	3.5	
All-Red Time (s)		2.0	2.0	2.0						2.0	2.0	
Lost Time Adjust (s)		0.0	0.0							0.0	0.0	
Total Lost Time (s)		5.5	5.5							5.5	5.5	
Lead/Lag		Lead	Lead							Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0	3.0						3.0	3.0	
Recall Mode		C-Max	C-Max	None						None	None	
Walk Time (s)		7.0	7.0	7.0						7.0	7.0	
Flash Dont Walk (s)		10.0	10.0	9.0						9.0	9.0	
Pedestrian Calls (#/hr)		0	0	0						0	0	
Act Effct Green (s)		55.3	55.3		66.1					17.4	17.4	
Actuated g/C Ratio		0.55	0.55		0.66					0.17	0.17	
v/c Ratio		0.08	0.04		0.24					0.71	0.37	
Control Delay		11.4	2.0		1.0					52.1	35.7	
Queue Delay		0.0	0.0		0.2					0.0	0.0	
Total Delay		11.4	2.0		1.2					52.1	35.7	
LOS		B	A		A					D	D	
Approach Delay		9.8			1.2						43.7	
Approach LOS		A			A						D	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 16 (16%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 20.0	Intersection LOS: B
Intersection Capacity Utilization 40.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2601: Pitkin & East



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	370	51	70	261	0	0	0	0	197	108	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		125	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt			0.850								0.970	
Flt Protected					0.990					0.950		
Satd. Flow (prot)	0	3539	1583	0	3470	0	0	0	0	1770	3433	0
Flt Permitted					0.798					0.950		
Satd. Flow (perm)	0	3539	1583	0	2797	0	0	0	0	1770	3433	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			87								30	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		763			148			439			686	
Travel Time (s)		17.3			3.4			10.0			15.6	
Peak Hour Factor	0.92	0.92	0.92	0.93	0.93	0.93	0.90	0.90	0.90	0.89	0.89	0.89
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	402	55	75	281	0	0	0	0	221	121	30
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	402	55	0	356	0	0	0	0	221	151	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		1	1	1	1					1	1	
Detector Template												
Leading Detector (ft)		50	50	50	50					50	50	
Trailing Detector (ft)		0	0	0	0					0	0	
Detector 1 Position(ft)		0	0	0	0					0	0	
Detector 1 Size(ft)		50	50	50	50					50	50	
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Turn Type		NA	Perm	pm+pt	NA					Split	NA	
Protected Phases		1		3	1 3					2	2	
Permitted Phases			1	1 3								
Detector Phase		1	1	3	1 3					2	2	
Switch Phase												
Minimum Initial (s)		6.0	6.0	6.0						6.0	6.0	
Minimum Split (s)		23.0	23.0	22.0						23.0	23.0	
Total Split (s)		35.0	35.0	31.0						34.0	34.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)		35.0%	35.0%	31.0%						34.0%	34.0%	
Maximum Green (s)		29.5	29.5	25.5						28.5	28.5	
Yellow Time (s)		3.5	3.5	3.5						3.5	3.5	
All-Red Time (s)		2.0	2.0	2.0						2.0	2.0	
Lost Time Adjust (s)		0.0	0.0							0.0	0.0	
Total Lost Time (s)		5.5	5.5							5.5	5.5	
Lead/Lag		Lead	Lead							Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0	3.0						3.0	3.0	
Recall Mode		C-Max	C-Max	None						None	None	
Walk Time (s)		7.0	7.0	7.0						7.0	7.0	
Flash Dont Walk (s)		10.0	10.0	9.0						9.0	9.0	
Pedestrian Calls (#/hr)		0	0	0						0	0	
Act Effct Green (s)		51.0	51.0		63.1					20.4	20.4	
Actuated g/C Ratio		0.51	0.51		0.63					0.20	0.20	
v/c Ratio		0.22	0.06		0.19					0.61	0.21	
Control Delay		10.9	0.2		6.5					45.7	28.1	
Queue Delay		0.0	0.0		0.1					0.0	0.0	
Total Delay		10.9	0.2		6.6					45.7	28.1	
LOS		B	A		A					D	C	
Approach Delay		9.6			6.6						38.6	
Approach LOS		A			A						D	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 94 (94%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 17.8	Intersection LOS: B
Intersection Capacity Utilization 44.1%	ICU Level of Service A
Analysis Period (min) 15	

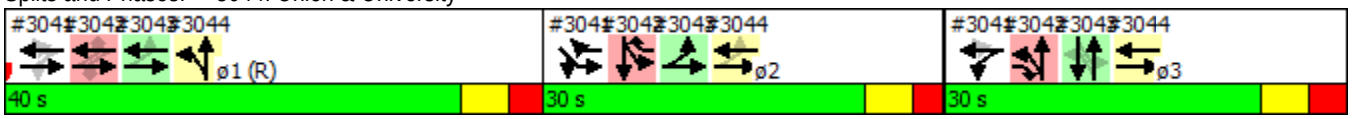
Splits and Phases: 2601: Pitkin & East

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	353	0	0	456	24	118	151	58	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00
Frt					0.993			0.959				
Flt Protected							0.950					
Satd. Flow (prot)	0	3471	0	0	3382	0	1703	3266	0	0	0	0
Flt Permitted							0.950					
Satd. Flow (perm)	0	3471	0	0	3382	0	1703	3266	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					8			60				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		316			584			383			361	
Travel Time (s)		7.2			13.3			8.7			8.2	
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.92	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	6%	6%	6%	6%	6%	6%	2%	2%	2%
Adj. Flow (vph)	0	401	0	0	496	26	131	168	64	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	401	0	0	522	0	131	232	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1			1		1	1				
Detector Template												
Leading Detector (ft)	50	50			50		50	50				
Trailing Detector (ft)	0	0			0		0	0				
Detector 1 Position(ft)	0	0			0		0	0				
Detector 1 Size(ft)	50	50			50		50	50				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0				
Turn Type		NA			NA		Split	NA				
Protected Phases		2 3			2 3		1	1				
Permitted Phases	2				2 3							
Detector Phase	2	2 3			2 3		1	1				
Switch Phase												
Minimum Initial (s)	6.0						7.0	7.0				
Minimum Split (s)	15.0						30.0	30.0				
Total Split (s)	30.0						40.0	40.0				
Total Split (%)	30.0%						40.0%	40.0%				
Maximum Green (s)	24.0						34.0	34.0				
Yellow Time (s)	3.5						3.5	3.5				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.5						2.5	2.5				
Lost Time Adjust (s)							0.0	0.0				
Total Lost Time (s)							6.0	6.0				
Lead/Lag	Lag						Lead	Lead				
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0						3.0	3.0				
Recall Mode	None						C-Max	C-Max				
Walk Time (s)							7.0	7.0				
Flash Dont Walk (s)							16.0	16.0				
Pedestrian Calls (#/hr)							0	0				
Act Effct Green (s)		53.5			53.5		34.5	34.5				
Actuated g/C Ratio		0.54			0.54		0.34	0.34				
v/c Ratio		0.22			0.29		0.22	0.20				
Control Delay		4.3			3.8		20.4	13.3				
Queue Delay		0.0			0.0		0.0	0.0				
Total Delay		4.3			3.8		20.4	13.3				
LOS		A			A		C	B				
Approach Delay		4.3			3.8			15.8				
Approach LOS		A			A			B				

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 38 (38%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 7.4	Intersection LOS: A
Intersection Capacity Utilization 29.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3044: Union & University



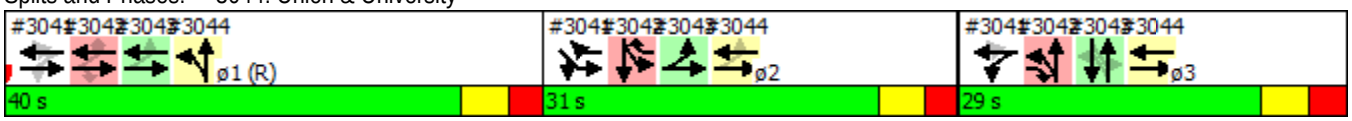
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	512	0	0	408	30	208	215	100	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00
Frt					0.990			0.952				
Flt Protected							0.950					
Satd. Flow (prot)	0	3539	0	0	3504	0	1770	3369	0	0	0	0
Flt Permitted		0.950					0.950					
Satd. Flow (perm)	0	3362	0	0	3504	0	1770	3369	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					12			82				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		298			584			576			361	
Travel Time (s)		6.8			13.3			13.1			8.2	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.86	0.86	0.86	0.90	0.90	0.90
Adj. Flow (vph)	6	656	0	0	523	38	242	250	116	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	662	0	0	561	0	242	366	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1			1		1	1				
Detector Template												
Leading Detector (ft)	50	50			50		50	50				
Trailing Detector (ft)	0	0			0		0	0				
Detector 1 Position(ft)	0	0			0		0	0				
Detector 1 Size(ft)	50	50			50		50	50				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0				
Turn Type	custom	NA			NA		Split	NA				
Protected Phases		2 3			2 3		1	1				
Permitted Phases	2				2 3							
Detector Phase	2	2 3			2 3		1	1				
Switch Phase												
Minimum Initial (s)	6.0						7.0	7.0				
Minimum Split (s)	15.0						30.0	30.0				
Total Split (s)	31.0						40.0	40.0				
Total Split (%)	31.0%						40.0%	40.0%				
Maximum Green (s)	25.0						34.0	34.0				
Yellow Time (s)	3.5						3.5	3.5				
All-Red Time (s)	2.5						2.5	2.5				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjust (s)							0.0	0.0				
Total Lost Time (s)							6.0	6.0				
Lead/Lag	Lag						Lead	Lead				
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0						3.0	3.0				
Recall Mode	None						C-Max	C-Max				
Walk Time (s)							7.0	7.0				
Flash Dont Walk (s)							16.0	16.0				
Pedestrian Calls (#/hr)							0	0				
Act Effct Green (s)		54.0			54.0		34.0	34.0				
Actuated g/C Ratio		0.54			0.54		0.34	0.34				
v/c Ratio		0.36			0.30		0.40	0.31				
Control Delay		6.7			8.2		33.3	24.4				
Queue Delay		0.8			0.0		0.0	0.0				
Total Delay		7.5			8.2		33.3	24.4				
LOS		A			A		C	C				
Approach Delay		7.5			8.2			27.9				
Approach LOS		A			A			C				

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 51 (51%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 14.5 Intersection LOS: B
Intersection Capacity Utilization 39.2% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3044: Union & University

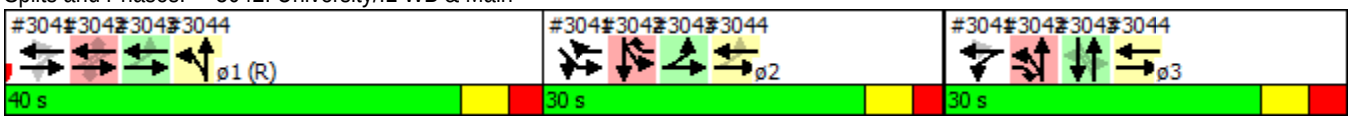


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	283	139	1	602	445	212	369	3	425	341	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	0		0	0		0	250		250
Storage Lanes	1		1	0		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	0.95	0.95	1.00	0.91	0.91	0.95	0.91	0.91	0.95
Frt		0.993	0.850			0.850		0.999			0.997	
Flt Protected	0.950						0.950	0.997		0.950	0.984	
Satd. Flow (prot)	1597	3039	1301	0	3312	1482	1579	3312	0	1507	3112	0
Flt Permitted	0.282				0.955		0.950	0.997		0.950	0.984	
Satd. Flow (perm)	474	3039	1301	0	3163	1482	1579	3312	0	1507	3112	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5	142			83		1			2	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		297			291			316			371	
Travel Time (s)		6.8			6.6			7.2			8.4	
Peak Hour Factor	0.87	0.87	0.87	0.90	0.90	0.90	0.81	0.81	0.81	0.92	0.92	0.92
Heavy Vehicles (%)	13%	13%	13%	9%	9%	9%	4%	4%	4%	9%	9%	9%
Adj. Flow (vph)	10	325	160	1	669	494	262	456	4	462	371	11
Shared Lane Traffic (%)			10%				11%			40%		
Lane Group Flow (vph)	10	341	144	0	670	494	233	489	0	277	567	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50	50	50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	50	50	50	50	50	50	50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Split	NA		Split	NA	
Protected Phases		1	3		1	2	3	3		2	2	
Permitted Phases	1		1	1		1						
Detector Phase	1	1	3	1	1	2	3	3		2	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	6.0	7.0	7.0	6.0	6.0	6.0		6.0	6.0	
Minimum Split (s)	30.0	30.0	15.0	30.0	30.0	15.0	15.0	15.0		15.0	15.0	
Total Split (s)	40.0	40.0	30.0	40.0	40.0	30.0	30.0	30.0		30.0	30.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	40.0%	40.0%	30.0%	40.0%	40.0%	30.0%	30.0%	30.0%		30.0%	30.0%	
Maximum Green (s)	34.0	34.0	23.5	34.0	34.0	24.0	23.5	23.5		24.0	24.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	2.5	2.5	3.0	2.5	2.5	2.5	3.0	3.0		2.5	2.5	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.5		6.0	6.0	6.5	6.5		6.0	6.0	
Lead/Lag	Lead	Lead		Lead	Lead	Lag				Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	None	C-Max	C-Max	None	None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0							
Flash Dont Walk (s)	16.0	16.0		16.0	16.0							
Pedestrian Calls (#/hr)	0	0		0	0							
Act Effct Green (s)	34.5	34.5	63.5		34.5	64.5	23.0	23.0		24.0	24.0	
Actuated g/C Ratio	0.34	0.34	0.64		0.34	0.64	0.23	0.23		0.24	0.24	
v/c Ratio	0.06	0.32	0.16		0.61	0.50	0.64	0.64		0.77	0.76	
Control Delay	24.4	24.1	5.7		8.2	5.5	38.8	34.1		51.1	42.7	
Queue Delay	0.0	0.0	0.0		0.2	2.2	0.8	0.6		0.0	0.0	
Total Delay	24.4	24.1	5.7		8.3	7.7	39.6	34.7		51.1	42.7	
LOS	C	C	A		A	A	D	C		D	D	
Approach Delay		18.7			8.1			36.3			45.4	
Approach LOS		B			A			D			D	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 38 (38%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 25.8	Intersection LOS: C
Intersection Capacity Utilization 63.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3042: University/IL WB & Main

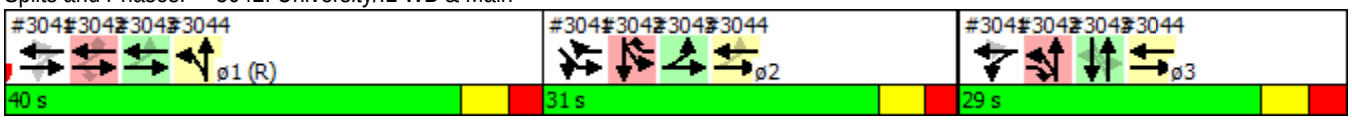


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	18	498	200	0	491	430	214	418	1	398	316	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	0		0	0		0	250		250
Storage Lanes	1		1	0		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	0.91	0.91	0.95	0.91	0.91	0.95
Frt		0.994	0.850			0.850					0.998	
Flt Protected	0.950						0.950	0.998		0.950	0.983	
Satd. Flow (prot)	1736	3305	1413	0	3438	1538	1610	3383	0	1595	3294	0
Flt Permitted	0.375						0.950	0.998		0.950	0.983	
Satd. Flow (perm)	685	3305	1413	0	3438	1538	1610	3383	0	1595	3294	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4	154			56					1	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		298			291			298			403	
Travel Time (s)		6.8			6.6			6.8			9.2	
Peak Hour Factor	0.83	0.83	0.83	0.93	0.93	0.93	0.84	0.84	0.84	0.85	0.85	0.85
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	2%	2%	2%	3%	3%	3%
Adj. Flow (vph)	22	600	241	0	528	462	255	498	1	468	372	6
Shared Lane Traffic (%)			10%				10%			41%		
Lane Group Flow (vph)	22	624	217	0	528	462	229	525	0	276	570	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1		1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50		50	50	50	50		50	50	
Trailing Detector (ft)	0	0	0		0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0		0	0	0	0		0	0	
Detector 1 Size(ft)	50	50	50		50	50	50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	Perm	NA	pm+ov		NA	pm+ov	Split	NA		Split	NA	
Protected Phases		1	3		1	2	3	3		2	2	
Permitted Phases	1		1			1						
Detector Phase	1	1	3		1	2	3	3		2	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	6.0		7.0	6.0	6.0	6.0		6.0	6.0	
Minimum Split (s)	30.0	30.0	15.0		30.0	15.0	15.0	15.0		15.0	15.0	
Total Split (s)	40.0	40.0	29.0		40.0	31.0	29.0	29.0		31.0	31.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	40.0%	40.0%	29.0%		40.0%	31.0%	29.0%	29.0%		31.0%	31.0%	
Maximum Green (s)	34.0	34.0	22.5		34.0	25.0	22.5	22.5		25.0	25.0	
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	2.5	2.5	3.0		2.5	2.5	3.0	3.0		2.5	2.5	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.5		6.0	6.0	6.5	6.5		6.0	6.0	
Lead/Lag	Lead	Lead			Lead	Lag				Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	None		C-Max	None	None	None		None	None	
Walk Time (s)	7.0	7.0			7.0							
Flash Dont Walk (s)	16.0	16.0			16.0							
Pedestrian Calls (#/hr)	0	0			0							
Act Effct Green (s)	34.0	34.0	62.5		34.0	65.0	22.5	22.5		25.0	25.0	
Actuated g/C Ratio	0.34	0.34	0.62		0.34	0.65	0.22	0.22		0.25	0.25	
v/c Ratio	0.09	0.55	0.23		0.45	0.45	0.63	0.69		0.69	0.69	
Control Delay	18.0	19.3	4.2		10.8	1.3	37.9	35.0		44.5	39.1	
Queue Delay	0.0	0.4	0.4		0.7	2.2	1.8	1.9		0.0	0.0	
Total Delay	18.0	19.7	4.6		11.5	3.5	39.8	36.9		44.5	39.1	
LOS	B	B	A		B	A	D	D		D	D	
Approach Delay		15.8			7.8			37.8			40.8	
Approach LOS		B			A			D			D	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 51 (51%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 24.4	Intersection LOS: C
Intersection Capacity Utilization 59.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3042: University/IL WB & Main

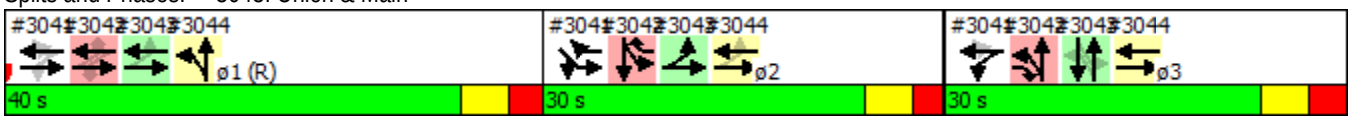


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	51	663	0	0	957	24	4	88	104	29	0	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00
Frt					0.996			0.919			0.899	
Flt Protected	0.950						0.950				0.988	
Satd. Flow (prot)	1641	4715	0	0	4874	0	1597	2936	0	0	1493	0
Flt Permitted	0.166						0.664				0.869	
Satd. Flow (perm)	287	4715	0	0	4874	0	1116	2936	0	0	1314	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					4			114			99	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		291			715			361			297	
Travel Time (s)		6.6			16.3			8.2			6.8	
Peak Hour Factor	0.82	0.82	0.82	0.92	0.92	0.92	0.91	0.91	0.91	0.88	0.88	0.88
Heavy Vehicles (%)	10%	10%	10%	6%	6%	6%	13%	13%	13%	13%	13%	13%
Adj. Flow (vph)	62	809	0	0	1040	26	4	97	114	33	0	99
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	809	0	0	1066	0	4	211	0	0	132	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1			1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50			50		50	50		50	50	
Trailing Detector (ft)	0	0			0		0	0		0	0	
Detector 1 Position(ft)	0	0			0		0	0		0	0	
Detector 1 Size(ft)	50	50			50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA			NA		Perm	NA		Perm	NA	
Protected Phases	2	1 2			1			3			3	
Permitted Phases	1 2						3			3		
Detector Phase	2	1 2			1		3	3		3	3	
Switch Phase												
Minimum Initial (s)	6.0				7.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	15.0				30.0		15.0	15.0		15.0	15.0	
Total Split (s)	30.0				40.0		30.0	30.0		30.0	30.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	30.0%				40.0%		30.0%	30.0%		30.0%	30.0%	
Maximum Green (s)	24.0				34.0		23.5	23.5		23.5	23.5	
Yellow Time (s)	3.5				3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.5				2.5		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0				0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0				6.0		6.5	6.5			6.5	
Lead/Lag	Lag				Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				3.0		3.0	3.0		3.0	3.0	
Recall Mode	None				C-Max		None	None		None	None	
Walk Time (s)					7.0							
Flash Dont Walk (s)					16.0							
Pedestrian Calls (#/hr)					0							
Act Effct Green (s)	58.5	64.5			34.5		23.0	23.0			23.0	
Actuated g/C Ratio	0.58	0.64			0.34		0.23	0.23			0.23	
v/c Ratio	0.13	0.27			0.63		0.02	0.28			0.35	
Control Delay	4.9	3.5			25.5		45.5	31.0			13.2	
Queue Delay	0.0	0.2			0.0		0.0	0.0			0.0	
Total Delay	4.9	3.7			25.5		45.5	31.0			13.2	
LOS	A	A			C		D	C			B	
Approach Delay		3.8			25.5			31.2			13.2	
Approach LOS		A			C			C			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 38 (38%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 17.1	Intersection LOS: B
Intersection Capacity Utilization 57.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3043: Union & Main



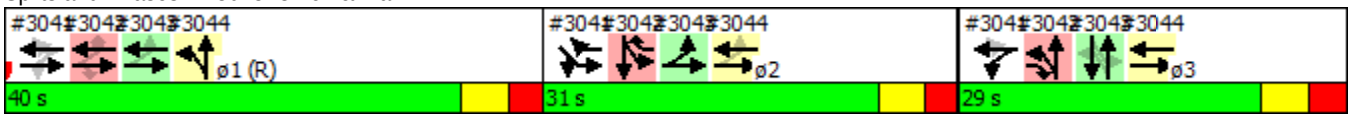
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	48	853	0	0	868	61	5	100	173	28	0	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	1.00	*0.60	0.91	1.00	0.95	0.95	1.00	1.00	1.00
Frt					0.990			0.905			0.915	
Flt Protected	0.950						0.950				0.982	
Satd. Flow (prot)	1752	5036	0	0	3256	0	1770	3203	0	0	1642	0
Flt Permitted	0.118						0.730				0.784	
Satd. Flow (perm)	218	5036	0	0	3256	0	1360	3203	0	0	1311	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					7			153			98	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		291			715			361			297	
Travel Time (s)		6.6			16.3			8.2			6.8	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.92	0.92	0.92	0.78	0.78	0.78
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	4%	4%	4%
Adj. Flow (vph)	55	969	0	0	986	69	5	109	188	36	0	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	55	969	0	0	1055	0	5	297	0	0	98	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1			1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50			50		50	50		50	50	
Trailing Detector (ft)	0	0			0		0	0		0	0	
Detector 1 Position(ft)	0	0			0		0	0		0	0	
Detector 1 Size(ft)	50	50			50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA			NA		Perm	NA		Perm	NA	
Protected Phases	2	1 2			1			3			3	
Permitted Phases	1 2						3			3		
Detector Phase	2	1 2			1		3	3		3	3	
Switch Phase												
Minimum Initial (s)	6.0				7.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	15.0				30.0		15.0	15.0		15.0	15.0	
Total Split (s)	31.0				40.0		29.0	29.0		29.0	29.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	31.0%				40.0%		29.0%	29.0%		29.0%	29.0%	
Maximum Green (s)	25.0				34.0		22.5	22.5		22.5	22.5	
Yellow Time (s)	3.5				3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.5				2.5		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0				0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0				6.0		6.5	6.5			6.5	
Lead/Lag	Lag				Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				3.0		3.0	3.0		3.0	3.0	
Recall Mode	None				C-Max		None	None		None	None	
Walk Time (s)					7.0							
Flash Dont Walk (s)					16.0							
Pedestrian Calls (#/hr)					0							
Act Effct Green (s)	59.0	65.0			34.0		22.5	22.5			22.5	
Actuated g/C Ratio	0.59	0.65			0.34		0.22	0.22			0.22	
v/c Ratio	0.11	0.30			0.95		0.02	0.35			0.26	
Control Delay	2.8	1.8			43.3		48.0	32.5			8.7	
Queue Delay	0.0	0.2			0.0		0.0	0.0			0.0	
Total Delay	2.8	2.0			43.3		48.0	32.5			8.7	
LOS	A	A			D		D	C			A	
Approach Delay		2.1			43.3			32.8			8.7	
Approach LOS		A			D			C			A	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 51 (51%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 23.6	Intersection LOS: C
Intersection Capacity Utilization 57.3%	ICU Level of Service B
Analysis Period (min) 15	

* User Entered Value

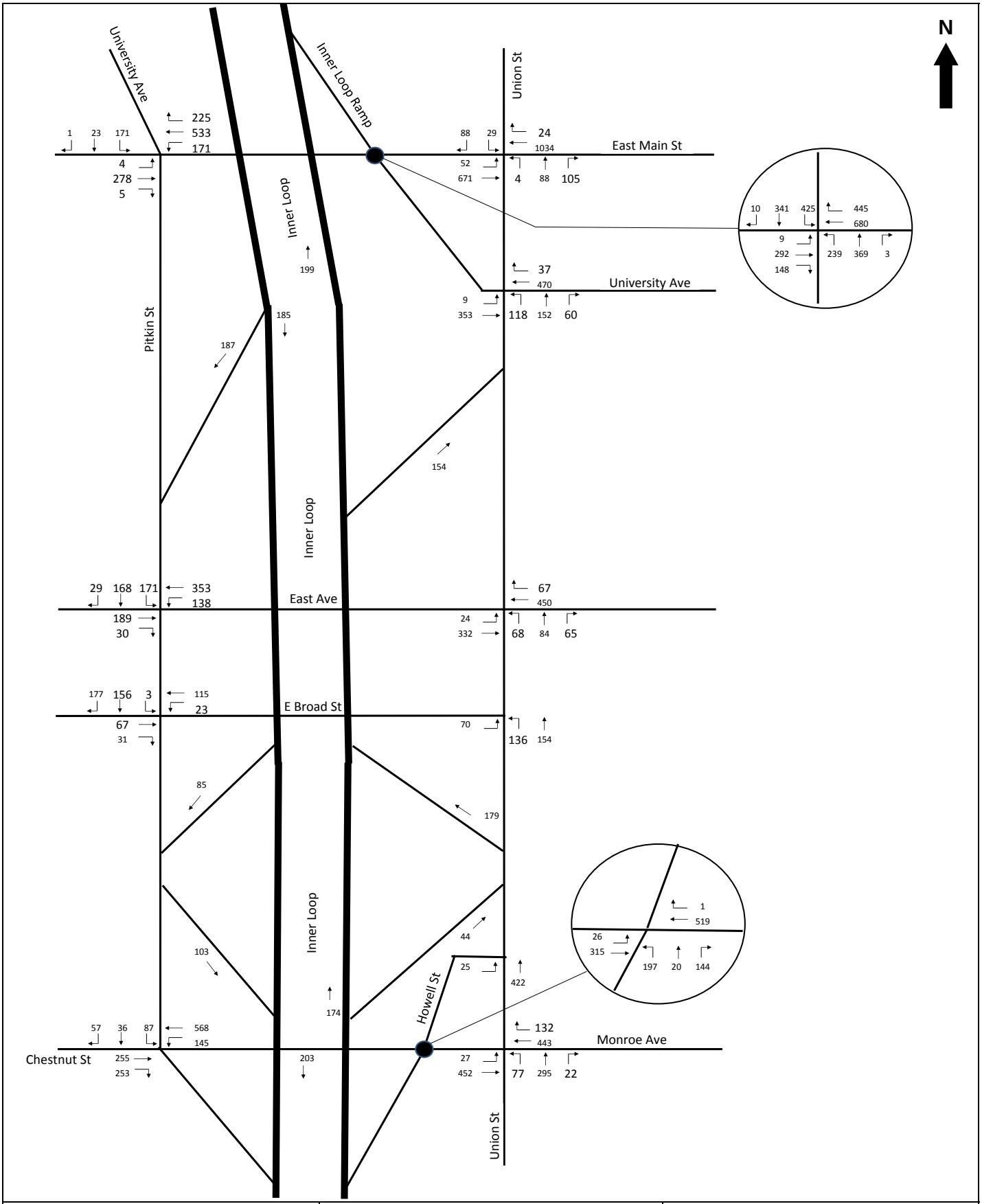
Splits and Phases: 3043: Union & Main



Appendix G – Traffic Analysis
Contents

2015 ETC Conditions

- **2015 ETC Traffic Volumes**
- **2015 ETC Capacity Analysis Printouts**
- **Synchro Files (available upon request)**

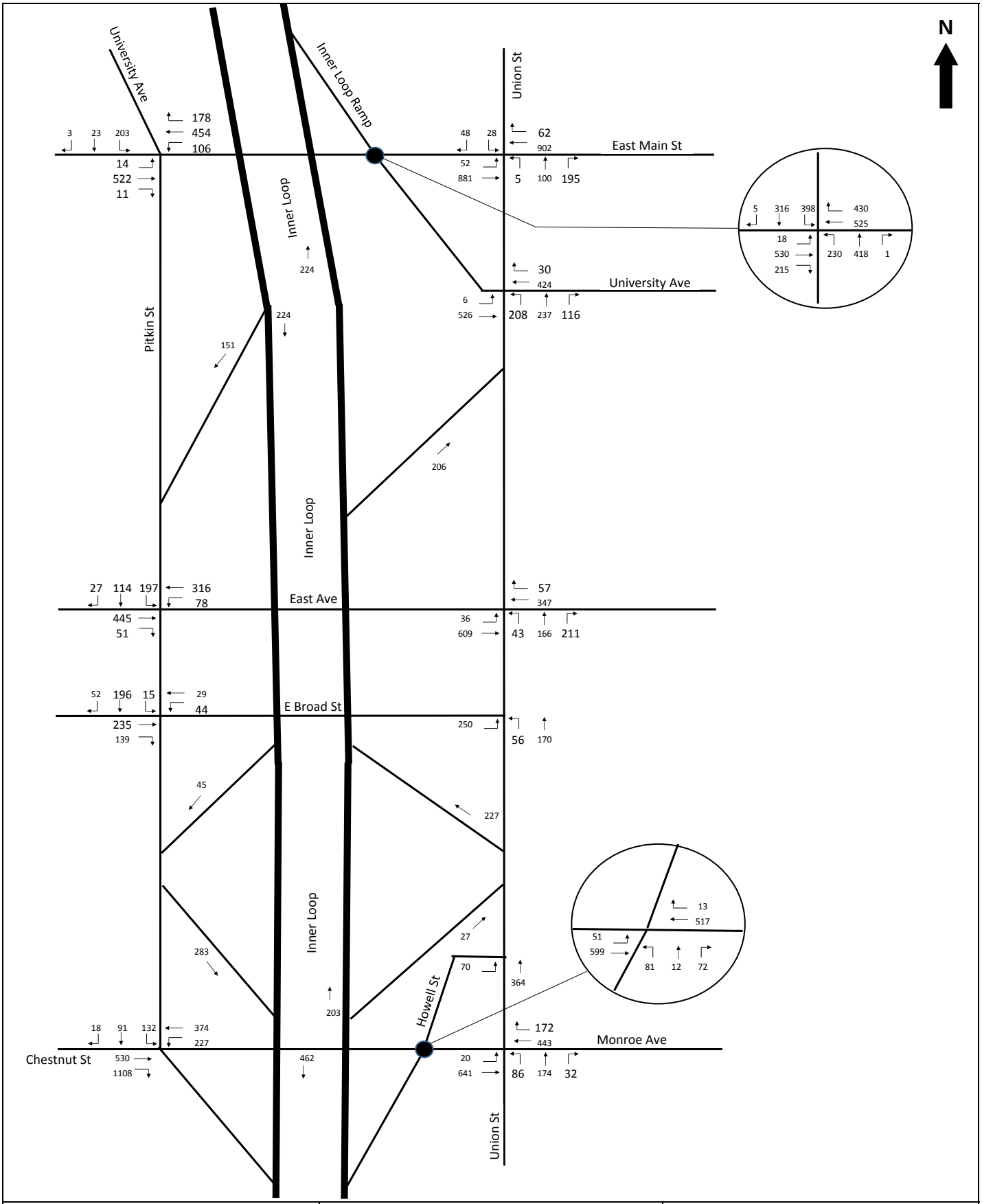


Stantec

61 Commercial Street
Rochester, New York 14614
T: (585) 475-1440

ROCHESTER INNER LOOP

2015 ETC Traffic Volumes
AM Peak Hour (7:30 AM - 8:30 AM)



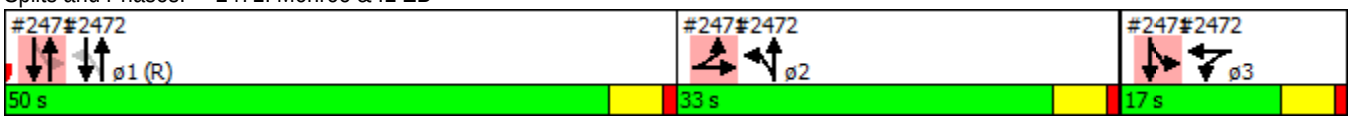
Stantec 61 Commercial Street Rochester, New York 14614 T: (585) 475-1440	**ROCHESTER INNER LOOP**	**2015 ETC Traffic Volumes** **PM Peak Hour (4:30 AM - 5:30 AM)**

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	81	12	72	0	0	0	0	517	13	51	599	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	0		0	0		50	0		0
Storage Lanes	1		0	0		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	1.00
Frt		0.871						0.996				
Flt Protected	0.950										0.996	
Satd. Flow (prot)	1787	1639	0	0	0	0	0	3525	0	0	3525	0
Flt Permitted	0.950										0.871	
Satd. Flow (perm)	1787	1639	0	0	0	0	0	3525	0	0	3083	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		90						3				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		324			342			410			178	
Travel Time (s)		7.4			7.8			9.3			4.0	
Peak Hour Factor	0.80	0.80	0.80	0.95	0.95	0.95	0.95	0.95	0.95	0.90	0.90	0.90
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	101	15	90	0	0	0	0	544	14	57	666	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	101	105	0	0	0	0	0	558	0	0	723	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1						1		1	1	
Detector Template												
Leading Detector (ft)	50	50						50		50	50	
Trailing Detector (ft)	0	0						0		0	0	
Detector 1 Position(ft)	0	0						0		0	0	
Detector 1 Size(ft)	50	50						50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex						Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0						0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0						0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0						0.0		0.0	0.0	
Turn Type	Split	NA						NA		pm+pt	NA	
Protected Phases	2	2						1		3	1 3	
Permitted Phases								1		1 3		
Detector Phase	2	2						1		3	1 3	
Switch Phase												
Minimum Initial (s)	6.0	6.0						7.0		6.0		
Minimum Split (s)	32.0	32.0						27.0		11.0		
Total Split (s)	33.0	33.0						50.0		17.0		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	33.0%	33.0%						50.0%		17.0%		
Maximum Green (s)	28.0	28.0						45.0		12.0		
Yellow Time (s)	4.0	4.0						4.0		4.0		
All-Red Time (s)	1.0	1.0						1.0		1.0		
Lost Time Adjust (s)	0.0	0.0						0.0				
Total Lost Time (s)	5.0	5.0						5.0				
Lead/Lag	Lag	Lag						Lead				
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0						2.0		3.0		
Recall Mode	Min	Min						C-Max		None		
Walk Time (s)	7.0	7.0						7.0				
Flash Dont Walk (s)	18.0	18.0						15.0				
Pedestrian Calls (#/hr)	0	0						0				
Act Effct Green (s)	12.7	12.7						58.3			72.3	
Actuated g/C Ratio	0.13	0.13						0.58			0.72	
v/c Ratio	0.45	0.37						0.27			0.32	
Control Delay	45.4	14.4						10.6			1.4	
Queue Delay	0.0	0.0						0.0			0.1	
Total Delay	45.4	14.4						10.6			1.5	
LOS	D	B						B			A	
Approach Delay		29.6						10.6			1.5	
Approach LOS		C						B			A	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 65 (65%), Referenced to phase 1:NBSB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.45	
Intersection Signal Delay: 8.8	Intersection LOS: A
Intersection Capacity Utilization 50.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2471: Monroe & IL EB



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	197	20	144	0	0	0	26	315	0	0	519	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	0		0	0		50
Storage Lanes	0		1	0		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95
Frt			0.850									
Flt Protected		0.957						0.996				
Satd. Flow (prot)	0	3259	1524	0	0	0	0	3457	0	0	3471	0
Flt Permitted		0.957						0.905				
Satd. Flow (perm)	0	3259	1524	0	0	0	0	3141	0	0	3471	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			180									
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		768			258			174			411	
Travel Time (s)		17.5			5.9			4.0			9.3	
Peak Hour Factor	0.80	0.80	0.80	0.90	0.95	0.90	0.92	0.92	0.92	0.94	0.94	0.94
Heavy Vehicles (%)	6%	6%	6%	2%	2%	2%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	246	25	180	0	0	0	28	342	0	0	552	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	271	180	0	0	0	0	370	0	0	553	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1				1	2			2	
Detector Template	Left		Right				Left	Thru			Thru	
Leading Detector (ft)	20	50	20				20	100			100	
Trailing Detector (ft)	0	0	0				0	0			0	
Detector 1 Position(ft)	0	0	0				0	0			0	
Detector 1 Size(ft)	20	50	20				20	6			6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex				Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0				0.0	0.0			0.0	
Detector 1 Queue (s)	0.0	0.0	0.0				0.0	0.0			0.0	
Detector 1 Delay (s)	0.0	0.0	0.0				0.0	0.0			0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type	Split	NA	Perm				pm+pt	NA			NA	
Protected Phases	2	2					3	1 3			1	
Permitted Phases			2				1 3				1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Detector Phase	2	2	2				3	1 3			1	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0				3.0				3.0	
Minimum Split (s)	32.0	32.0	32.0				25.0				25.0	
Total Split (s)	32.0	32.0	32.0				25.0				28.0	
Total Split (%)	37.6%	37.6%	37.6%				29.4%				32.9%	
Maximum Green (s)	27.0	27.0	27.0				20.0				23.0	
Yellow Time (s)	4.0	4.0	4.0				4.0				4.0	
All-Red Time (s)	1.0	1.0	1.0				1.0				1.0	
Lost Time Adjust (s)		0.0	0.0								0.0	
Total Lost Time (s)		5.0	5.0								5.0	
Lead/Lag	Lag	Lag	Lag								Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0				3.0				3.0	
Recall Mode	Min	Min	Min				None				C-Max	
Walk Time (s)	7.0	7.0	7.0				5.0				5.0	
Flash Dont Walk (s)	18.0	18.0	18.0				15.0				15.0	
Pedestrian Calls (#/hr)	0	0	0				0				0	
Act Effct Green (s)		12.6	12.6					57.4			48.9	
Actuated g/C Ratio		0.15	0.15					0.68			0.58	
v/c Ratio		0.98dl	0.48					0.17			0.28	
Control Delay		37.9	9.5					4.0			10.3	
Queue Delay		0.0	0.0					0.3			0.0	
Total Delay		37.9	9.5					4.3			10.3	
LOS		D	A					A			B	
Approach Delay		26.6						4.3			10.3	
Approach LOS		C						A			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 85	
Actuated Cycle Length: 85	
Offset: 73 (86%), Referenced to phase 1:NWSE, Start of Green	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 14.0	Intersection LOS: B
Intersection Capacity Utilization 47.3%	ICU Level of Service A
Analysis Period (min) 15	
dl Defacto Left Lane. Recode with 1 though lane as a left lane.	

Splits and Phases: 2471: IL EB

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR
Lane Configurations										
Volume (vph)	0	0	0	87	36	57	255	253	145	568
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.91	0.97	0.88	1.00	0.95
Frt					0.953			0.850	0.911	0.850
Flt Protected					0.976		0.950		0.980	
Satd. Flow (prot)	0	0	0	0	4639	0	3400	2760	1631	1475
Flt Permitted					0.976		0.950		0.768	
Satd. Flow (perm)	0	0	0	0	4639	0	3400	2760	1278	1475
Right Turn on Red			Yes			Yes		Yes		
Satd. Flow (RTOR)					71			269		
Link Speed (mph)		30			30		30		30	
Link Distance (ft)		470			260		648		174	
Travel Time (s)		10.7			5.9		14.7		4.0	
Peak Hour Factor	0.90	0.90	0.90	0.80	0.80	0.80	0.94	0.94	0.88	0.88
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	4%	4%
Adj. Flow (vph)	0	0	0	109	45	71	271	269	165	645
Shared Lane Traffic (%)										37%
Lane Group Flow (vph)	0	0	0	0	225	0	271	269	404	406
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Right	Left	Right
Median Width(ft)		0			0		36		12	
Link Offset(ft)		0			0		0		0	
Crosswalk Width(ft)		16			16		16		16	
Two way Left Turn Lane										
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	30	25	15	9
Number of Detectors				1	2		1	1	1	1
Detector Template				Left	Thru		Left	Right	Left	Right
Leading Detector (ft)				20	100		20	20	20	20
Trailing Detector (ft)				0	0		0	0	0	0
Detector 1 Position(ft)				0	0		0	0	0	0
Detector 1 Size(ft)				20	6		20	20	20	20
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel										
Detector 1 Extend (s)				0.0	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)				0.0	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)				0.0	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(ft)					94					
Detector 2 Size(ft)					6					
Detector 2 Type					Cl+Ex					
Detector 2 Channel										
Detector 2 Extend (s)					0.0					
Turn Type				Split	NA		Prot	Free	D.P+P	pt+ov
Protected Phases				3	3		1		2	1 2
Permitted Phases								Free	1 2	
Detector Phase				3	3		1		2	1 2
Switch Phase										
Minimum Initial (s)				3.0	3.0		3.0		3.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR
Minimum Split (s)				25.0	25.0		25.0		25.0	
Total Split (s)				25.0	25.0		25.0		25.0	
Total Split (%)				33.3%	33.3%		33.3%		33.3%	
Maximum Green (s)				20.0	20.0		20.0		20.0	
Yellow Time (s)				3.0	3.0		3.0		3.0	
All-Red Time (s)				2.0	2.0		2.0		2.0	
Lost Time Adjust (s)					0.0		0.0		0.0	
Total Lost Time (s)					5.0		5.0		5.0	
Lead/Lag							Lead		Lag	
Lead-Lag Optimize?										
Vehicle Extension (s)				3.0	3.0		3.0		3.0	
Recall Mode				None	None		C-Max		Max	
Walk Time (s)				5.0	5.0		5.0		5.0	
Flash Dont Walk (s)				15.0	15.0		15.0		15.0	
Pedestrian Calls (#/hr)				0	0		0		0	
Act Effct Green (s)					7.9		32.1	75.0	52.1	57.1
Actuated g/C Ratio					0.11		0.43	1.00	0.69	0.76
v/c Ratio					0.41		0.19	0.10	0.41	0.36
Control Delay					23.2		14.1	0.1	5.1	4.2
Queue Delay					0.0		0.0	0.0	3.0	7.4
Total Delay					23.2		14.1	0.1	8.1	11.6
LOS					C		B	A	A	B
Approach Delay					23.2		7.1		9.9	
Approach LOS					C		A		A	

Intersection Summary	
Area Type: Other	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 65 (87%), Referenced to phase 1:NWSBL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.41	
Intersection Signal Delay: 10.8	Intersection LOS: B
Intersection Capacity Utilization 44.3%	ICU Level of Service A
Analysis Period (min) 15	

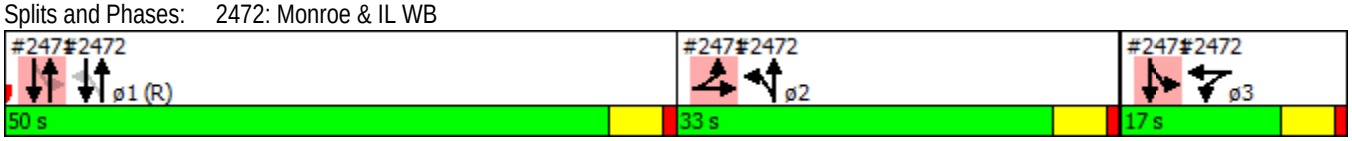
Splits and Phases: 571:

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	132	91	18	227	374	0	0	530	1108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.91	0.95	0.95	1.00	1.00	0.95	0.88
Frt					0.989							0.850
Flt Protected					0.973			0.981				
Satd. Flow (prot)	0	0	0	0	4894	0	0	3472	0	0	3539	2787
Flt Permitted					0.973			0.615				
Satd. Flow (perm)	0	0	0	0	4894	0	0	2177	0	0	3539	2787
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					11							1180
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		410			1028			178			627	
Travel Time (s)		9.3			23.4			4.0			14.3	
Peak Hour Factor	0.95	0.95	0.95	0.92	0.92	0.92	0.94	0.94	0.94	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	143	99	20	241	398	0	0	582	1218
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	262	0	0	639	0	0	582	1218
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		25
Number of Detectors				1	1		1	1			1	1
Detector Template												
Leading Detector (ft)				50	50		50	50			50	50
Trailing Detector (ft)				0	0		0	0			0	0
Detector 1 Position(ft)				0	0		0	0			0	0
Detector 1 Size(ft)				50	50		50	50			50	50
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0	0.0		0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0	0.0		0.0	0.0			0.0	0.0
Turn Type				Split	NA		pm+pt	NA			NA	Free
Protected Phases				3	3		2	1 2			1	
Permitted Phases							1 2					Free
Detector Phase				3	3		2	1 2			1	
Switch Phase												
Minimum Initial (s)				6.0	6.0		6.0				7.0	
Minimum Split (s)				11.0	11.0		32.0				27.0	
Total Split (s)				17.0	17.0		33.0				50.0	
Total Split (%)				17.0%	17.0%		33.0%				50.0%	
Maximum Green (s)				12.0	12.0		28.0				45.0	
Yellow Time (s)				4.0	4.0		4.0				4.0	
All-Red Time (s)				1.0	1.0		1.0				1.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjust (s)					0.0						0.0	
Total Lost Time (s)					5.0						5.0	
Lead/Lag							Lag				Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0				2.0	
Recall Mode				None	None		Min				C-Max	
Walk Time (s)							7.0				7.0	
Flash Dont Walk (s)							18.0				15.0	
Pedestrian Calls (#/hr)							0				0	
Act Effct Green (s)					14.0			71.0			58.3	100.0
Actuated g/C Ratio					0.14			0.71			0.58	1.00
v/c Ratio					0.38			0.37			0.28	0.44
Control Delay					38.5			2.6			8.8	0.4
Queue Delay					0.0			0.0			0.0	0.0
Total Delay					38.5			2.6			8.8	0.4
LOS					D			A			A	A
Approach Delay					38.5			2.6			3.1	
Approach LOS					D			A			A	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 65 (65%), Referenced to phase 1:NBSB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.45	
Intersection Signal Delay: 6.4	Intersection LOS: A
Intersection Capacity Utilization 51.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2472: Monroe & IL WB



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	27	452	0	0	443	132	77	295	22	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		50	250		250	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00
Frt					0.996	0.850		0.990				
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1719	1810	0	0	1729	1475	1752	3470	0	0	0	0
Flt Permitted	0.312						0.950					
Satd. Flow (perm)	565	1810	0	0	1729	1475	1752	3470	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					3	88		9				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		236			714			600			597	
Travel Time (s)		5.4			16.2			13.6			13.6	
Peak Hour Factor	0.85	0.85	0.85	0.90	0.90	0.90	0.90	0.90	0.90	0.95	0.95	0.90
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	32	532	0	0	492	147	86	328	24	0	0	0
Shared Lane Traffic (%)						10%						
Lane Group Flow (vph)	32	532	0	0	507	132	86	352	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2	1	1	1				
Detector Template	Left	Thru			Thru		Left					
Leading Detector (ft)	20	100			100	50	20	50				
Trailing Detector (ft)	0	0			0	0	0	0				
Detector 1 Position(ft)	0	0			0	0	0	0				
Detector 1 Size(ft)	20	6			6	50	20	50				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0	0.0				
Detector 2 Position(ft)		94			94							
Detector 2 Size(ft)		6			6							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type	D.Pm	NA			NA	Perm	Perm	NA				
Protected Phases					4			2				
Permitted Phases	4	4				4	2					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4			4	4	2	2				
Switch Phase												
Minimum Initial (s)	3.0	3.0			3.0	3.0	9.0	9.0				
Minimum Split (s)	25.0	25.0			25.0	25.0	22.0	22.0				
Total Split (s)	52.0	52.0			52.0	52.0	28.0	28.0				
Total Split (%)	65.0%	65.0%			65.0%	65.0%	35.0%	35.0%				
Maximum Green (s)	47.0	47.0			47.0	47.0	23.0	23.0				
Yellow Time (s)	5.0	5.0			5.0	5.0	4.0	4.0				
All-Red Time (s)	0.0	0.0			0.0	0.0	1.0	1.0				
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0	0.0				
Total Lost Time (s)	5.0	5.0			5.0	5.0	5.0	5.0				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0			3.0	3.0	4.0	4.0				
Recall Mode	None	None			None	None	Max	Max				
Walk Time (s)	5.0	5.0			5.0	5.0	7.0	7.0				
Flash Dont Walk (s)	15.0	15.0			15.0	15.0	8.0	8.0				
Pedestrian Calls (#/hr)	0	0			0	0	0	0				
Act Effct Green (s)	27.9	27.9			27.9	27.9	23.7	23.7				
Actuated g/C Ratio	0.45	0.45			0.45	0.45	0.38	0.38				
v/c Ratio	0.13	0.65			0.65	0.19	0.13	0.26				
Control Delay	9.7	16.5			16.5	4.2	17.2	16.1				
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0				
Total Delay	9.7	16.5			16.5	4.2	17.2	16.1				
LOS	A	B			B	A	B	B				
Approach Delay		16.1			13.9			16.3				
Approach LOS		B			B			B				

Intersection Summary	
Area Type: Other	
Cycle Length: 80	
Actuated Cycle Length: 61.9	
Natural Cycle: 50	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 15.3	Intersection LOS: B
Intersection Capacity Utilization 43.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 246: Union & Monroe

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	641	0	0	443	172	86	174	32	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	250		250	0		0
Storage Lanes	1		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt					0.962			0.977				
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1787	1881	0	0	1810	0	1752	3424	0	0	0	0
Flt Permitted	0.346						0.950					
Satd. Flow (perm)	651	1881	0	0	1810	0	1752	3424	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					42			19				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		236			685			470			510	
Travel Time (s)		5.4			15.6			10.7			11.6	
Peak Hour Factor	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	22	697	0	0	509	198	100	202	37	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	697	0	0	707	0	100	239	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1			1		1	1				
Detector Template												
Leading Detector (ft)	50	50			50		50	50				
Trailing Detector (ft)	0	0			0		0	0				
Detector 1 Position(ft)	0	0			0		0	0				
Detector 1 Size(ft)	50	50			50		50	50				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0				
Turn Type	Perm	NA			NA		Split	NA				
Protected Phases		1			1		2	2				
Permitted Phases	1											
Detector Phase	1	1			1		2	2				
Switch Phase												
Minimum Initial (s)	7.0	7.0			7.0		9.0	9.0				
Minimum Split (s)	23.0	23.0			23.0		22.0	22.0				
Total Split (s)	72.0	72.0			72.0		28.0	28.0				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	72.0%	72.0%			72.0%		28.0%	28.0%				
Maximum Green (s)	67.0	67.0			67.0		23.0	23.0				
Yellow Time (s)	4.0	4.0			4.0		4.0	4.0				
All-Red Time (s)	1.0	1.0			1.0		1.0	1.0				
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0				
Total Lost Time (s)	5.0	5.0			5.0		5.0	5.0				
Lead/Lag	Lead	Lead			Lead		Lag	Lag				
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0			2.0		4.0	4.0				
Recall Mode	C-Max	C-Max			C-Max		None	None				
Walk Time (s)	7.0	7.0			7.0		7.0	7.0				
Flash Dont Walk (s)	11.0	11.0			11.0		8.0	8.0				
Pedestrian Calls (#/hr)	0	0			0		0	0				
Act Effct Green (s)	77.1	77.1			77.1		12.9	12.9				
Actuated g/C Ratio	0.77	0.77			0.77		0.13	0.13				
v/c Ratio	0.04	0.48			0.50		0.44	0.52				
Control Delay	3.0	7.2			3.9		45.8	41.0				
Queue Delay	0.0	0.4			0.1		0.0	0.0				
Total Delay	3.0	7.5			4.0		45.8	41.0				
LOS	A	A			A		D	D				
Approach Delay		7.4			4.0			42.5				
Approach LOS		A			A			D				

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 97 (97%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.52	
Intersection Signal Delay: 12.8	Intersection LOS: B
Intersection Capacity Utilization 49.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 246: Union & Monroe

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø2
Lane Configurations							
Volume (vph)	70	0	136	154	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0	0	200			0	
Storage Lanes	2	0	1			0	
Taper Length (ft)	25		25				
Lane Util. Factor	0.97	1.00	1.00	0.95	1.00	1.00	
Frt							
Flt Protected	0.950		0.950				
Satd. Flow (prot)	3367	0	1770	3539	0	0	
Flt Permitted	0.950		0.950				
Satd. Flow (perm)	3367	0	1770	3539	0	0	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)							
Link Speed (mph)	30			30	30		
Link Distance (ft)	136			556	451		
Travel Time (s)	3.1			12.6	10.3		
Peak Hour Factor	0.90	0.90	0.95	0.95	0.90	0.90	
Heavy Vehicles (%)	4%	4%	2%	2%	2%	2%	
Adj. Flow (vph)	78	0	143	162	0	0	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	78	0	143	162	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	24			12	12		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9	15			9	
Number of Detectors	1		1	1			
Detector Template							
Leading Detector (ft)	50		50	50			
Trailing Detector (ft)	0		0	0			
Detector 1 Position(ft)	0		0	0			
Detector 1 Size(ft)	50		50	50			
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex			
Detector 1 Channel							
Detector 1 Extend (s)	0.0		0.0	0.0			
Detector 1 Queue (s)	0.0		0.0	0.0			
Detector 1 Delay (s)	0.0		0.0	0.0			
Turn Type	Prot		Prot	NA			
Protected Phases	1		3	2 3			2
Permitted Phases							
Detector Phase	1		3	2 3			
Switch Phase							
Minimum Initial (s)	7.0		6.0				10.0
Minimum Split (s)	21.0		24.0				28.0
Total Split (s)	22.0		39.0				39.0

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø2
Total Split (%)	22.0%		39.0%				39%
Maximum Green (s)	16.0		34.0				34.0
Yellow Time (s)	4.0		4.0				4.0
All-Red Time (s)	2.0		1.0				1.0
Lost Time Adjust (s)	0.0		0.0				
Total Lost Time (s)	6.0		5.0				
Lead/Lag	Lead						Lag
Lead-Lag Optimize?							
Vehicle Extension (s)	2.0		4.0				3.0
Recall Mode	C-Max		None				None
Walk Time (s)	7.0						7.0
Flash Dont Walk (s)	8.0						15.0
Pedestrian Calls (#/hr)	0						0
Act Effct Green (s)	57.9		14.9	31.1			
Actuated g/C Ratio	0.58		0.15	0.31			
v/c Ratio	0.04		0.54	0.15			
Control Delay	1.5		46.3	23.8			
Queue Delay	0.4		0.0	0.0			
Total Delay	1.9		46.3	23.8			
LOS	A		D	C			
Approach Delay	1.9			34.3			
Approach LOS	A			C			

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 54 (54%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 27.7	Intersection LOS: C
Intersection Capacity Utilization 23.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2592: Union & Broad

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø2
Lane Configurations							
Volume (vph)	250	0	56	170	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0	0	200			0	
Storage Lanes	2	0	1			0	
Taper Length (ft)	25		25				
Lane Util. Factor	0.97	1.00	1.00	0.95	1.00	1.00	
Frt							
Flt Protected	0.950		0.950				
Satd. Flow (prot)	3433	0	1787	3574	0	0	
Flt Permitted	0.950		0.950				
Satd. Flow (perm)	3433	0	1787	3574	0	0	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)							
Link Speed (mph)	30			30	30		
Link Distance (ft)	175			499	451		
Travel Time (s)	4.0			11.3	10.3		
Peak Hour Factor	0.88	0.88	0.86	0.86	0.90	0.90	
Heavy Vehicles (%)	2%	2%	1%	1%	2%	2%	
Adj. Flow (vph)	284	0	65	198	0	0	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	284	0	65	198	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	24			12	12		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9	15			9	
Number of Detectors	1		1	1			
Detector Template							
Leading Detector (ft)	50		50	50			
Trailing Detector (ft)	0		0	0			
Detector 1 Position(ft)	0		0	0			
Detector 1 Size(ft)	50		50	50			
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex			
Detector 1 Channel							
Detector 1 Extend (s)	0.0		0.0	0.0			
Detector 1 Queue (s)	0.0		0.0	0.0			
Detector 1 Delay (s)	0.0		0.0	0.0			
Turn Type	Prot		Prot	NA			
Protected Phases	1		3	2 3			2
Permitted Phases							
Detector Phase	1		3	2 3			
Switch Phase							
Minimum Initial (s)	7.0		6.0				10.0
Minimum Split (s)	21.0		24.0				28.0
Total Split (s)	31.0		24.0				45.0

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø2
Total Split (%)	31.0%		24.0%				45%
Maximum Green (s)	25.0		19.0				40.0
Yellow Time (s)	4.0		4.0				4.0
All-Red Time (s)	2.0		1.0				1.0
Lost Time Adjust (s)	0.0		0.0				
Total Lost Time (s)	6.0		5.0				
Lead/Lag	Lead						Lag
Lead-Lag Optimize?							
Vehicle Extension (s)	2.0		4.0				3.0
Recall Mode	C-Max		None				None
Walk Time (s)	7.0						7.0
Flash Dont Walk (s)	8.0						15.0
Pedestrian Calls (#/hr)	0						0
Act Effct Green (s)	62.3		10.1	26.7			
Actuated g/C Ratio	0.62		0.10	0.27			
v/c Ratio	0.13		0.36	0.21			
Control Delay	3.3		46.5	28.0			
Queue Delay	0.4		0.0	0.0			
Total Delay	3.7		46.5	28.0			
LOS	A		D	C			
Approach Delay	3.7			32.6			
Approach LOS	A			C			

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 25 (25%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 17.6	Intersection LOS: B
Intersection Capacity Utilization 24.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2592: Union & Broad

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	67	31	23	115	0	0	0	0	3	156	177
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.91	0.91	0.91
Frt			0.850								0.921	
Flt Protected					0.992							
Satd. Flow (prot)	0	3471	1553	0	3511	0	0	0	0	0	4684	0
Flt Permitted					0.918							
Satd. Flow (perm)	0	3471	1553	0	3249	0	0	0	0	0	4684	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			76								216	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		786			136			477			435	
Travel Time (s)		17.9			3.1			10.8			9.9	
Peak Hour Factor	0.78	0.78	0.78	0.85	0.85	0.85	0.90	0.90	0.90	0.82	0.82	0.82
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	86	40	27	135	0	0	0	0	4	190	216
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	86	40	0	162	0	0	0	0	0	410	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		1	1	1	1					1	1	
Detector Template												
Leading Detector (ft)		50	50	50	50					50	50	
Trailing Detector (ft)		0	0	0	0					0	0	
Detector 1 Position(ft)		0	0	0	0					0	0	
Detector 1 Size(ft)		50	50	50	50					50	50	
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Turn Type		NA	Perm	D.P+P	NA					Split	NA	
Protected Phases		1		3	1 3					2	2	
Permitted Phases			1	1								
Detector Phase		1	1	3	1 3					2	2	
Switch Phase												
Minimum Initial (s)		7.0	7.0	6.0						10.0	10.0	
Minimum Split (s)		21.0	21.0	24.0						28.0	28.0	
Total Split (s)		22.0	22.0	39.0						39.0	39.0	
Total Split (%)		22.0%	22.0%	39.0%						39.0%	39.0%	
Maximum Green (s)		16.0	16.0	34.0						34.0	34.0	
Yellow Time (s)		4.0	4.0	4.0						4.0	4.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)		2.0	2.0	1.0						1.0	1.0	
Lost Time Adjust (s)		0.0	0.0								0.0	
Total Lost Time (s)		6.0	6.0								5.0	
Lead/Lag		Lead	Lead							Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0	4.0						3.0	3.0	
Recall Mode		C-Max	C-Max	None						None	None	
Walk Time (s)		7.0	7.0							7.0	7.0	
Flash Dont Walk (s)		8.0	8.0							15.0	15.0	
Pedestrian Calls (#/hr)		0	0							0	0	
Act Effct Green (s)		57.9	57.9		71.8						11.2	
Actuated g/C Ratio		0.58	0.58		0.72						0.11	
v/c Ratio		0.04	0.04		0.07						0.57	
Control Delay		5.6	2.2		0.5						11.1	
Queue Delay		0.0	0.0		0.2						0.0	
Total Delay		5.6	2.2		0.7						11.1	
LOS		A	A		A						B	
Approach Delay		4.5			0.7						11.1	
Approach LOS		A			A						B	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 54 (54%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 7.5	Intersection LOS: A
Intersection Capacity Utilization 34.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2591: Pitkin & Broad

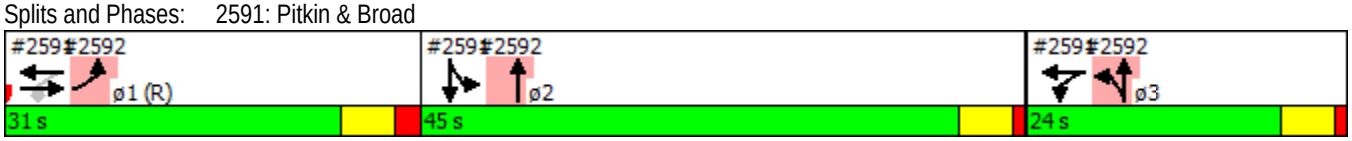
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	235	139	44	29	0	0	0	0	15	196	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.91	0.91	0.91
Frt			0.850								0.970	
Flt Protected					0.971						0.997	
Satd. Flow (prot)	0	3539	1583	0	3437	0	0	0	0	0	4918	0
Flt Permitted					0.737						0.997	
Satd. Flow (perm)	0	3539	1583	0	2608	0	0	0	0	0	4918	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			185								63	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		750			175			248			439	
Travel Time (s)		17.0			4.0			5.6			10.0	
Peak Hour Factor	0.75	0.75	0.75	0.77	0.77	0.77	0.90	0.90	0.90	0.82	0.82	0.82
Adj. Flow (vph)	0	313	185	57	38	0	0	0	0	18	239	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	313	185	0	95	0	0	0	0	0	320	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		1	1	1	1					1	1	
Detector Template												
Leading Detector (ft)		50	50	50	50					50	50	
Trailing Detector (ft)		0	0	0	0					0	0	
Detector 1 Position(ft)		0	0	0	0					0	0	
Detector 1 Size(ft)		50	50	50	50					50	50	
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Turn Type		NA	Perm	D.P+P	NA					Split	NA	
Protected Phases		1		3	1 3					2	2	
Permitted Phases			1	1								
Detector Phase		1	1	3	1 3					2	2	
Switch Phase												
Minimum Initial (s)		7.0	7.0	6.0						10.0	10.0	
Minimum Split (s)		21.0	21.0	24.0						28.0	28.0	
Total Split (s)		31.0	31.0	24.0						45.0	45.0	
Total Split (%)		31.0%	31.0%	24.0%						45.0%	45.0%	
Maximum Green (s)		25.0	25.0	19.0						40.0	40.0	
Yellow Time (s)		4.0	4.0	4.0						4.0	4.0	
All-Red Time (s)		2.0	2.0	1.0						1.0	1.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjust (s)		0.0	0.0								0.0	
Total Lost Time (s)		6.0	6.0								5.0	
Lead/Lag		Lead	Lead							Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0	4.0						3.0	3.0	
Recall Mode		C-Max	C-Max	None						None	None	
Walk Time (s)		7.0	7.0							7.0	7.0	
Flash Dont Walk (s)		8.0	8.0							15.0	15.0	
Pedestrian Calls (#/hr)		0	0							0	0	
Act Effct Green (s)		62.3	62.3		71.4						11.6	
Actuated g/C Ratio		0.62	0.62		0.71						0.12	
v/c Ratio		0.14	0.18		0.05						0.51	
Control Delay		5.9	0.6		1.1						31.3	
Queue Delay		0.0	0.0		0.1						0.0	
Total Delay		5.9	0.6		1.2						31.3	
LOS		A	A		A						C	
Approach Delay		3.9			1.2						31.3	
Approach LOS		A			A						C	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 25 (25%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 13.2 Intersection LOS: B
Intersection Capacity Utilization 36.9% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 2591: Pitkin & Broad

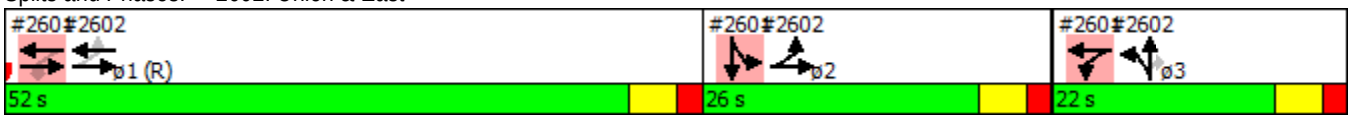


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	332	0	0	450	67	68	84	65	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Frt					0.981				0.850			
Flt Protected		0.997						0.978				
Satd. Flow (prot)	0	3461	0	0	3405	0	0	3362	1538	0	0	0
Flt Permitted		0.906						0.978				
Satd. Flow (perm)	0	3145	0	0	3405	0	0	3362	1538	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					22				87			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		123			667			451			780	
Travel Time (s)		2.8			15.2			10.3			17.7	
Peak Hour Factor	0.76	0.76	0.76	0.93	0.93	0.93	0.94	0.94	0.94	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	5%	5%	5%	2%	2%	2%
Adj. Flow (vph)	32	437	0	0	484	72	72	89	69	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	469	0	0	556	0	0	161	69	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1			1		1	1	1			
Detector Template												
Leading Detector (ft)	50	50			50		50	50	50			
Trailing Detector (ft)	0	0			0		0	0	0			
Detector 1 Position(ft)	0	0			0		0	0	0			
Detector 1 Size(ft)	50	50			50		50	50	50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Turn Type	pm+pt	NA			NA		Split	NA	Perm			
Protected Phases	2	1 2			1		3	3				
Permitted Phases	1 2								3			
Detector Phase	2	1 2			1		3	3	3			
Switch Phase												
Minimum Initial (s)	6.0				6.0		6.0	6.0	6.0			
Minimum Split (s)	23.0				23.0		22.0	22.0	22.0			
Total Split (s)	26.0				52.0		22.0	22.0	22.0			
Total Split (%)	26.0%				52.0%		22.0%	22.0%	22.0%			
Maximum Green (s)	20.5				46.5		16.5	16.5	16.5			
Yellow Time (s)	3.5				3.5		3.5	3.5	3.5			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.0				2.0		2.0	2.0	2.0			
Lost Time Adjust (s)					0.0			0.0	0.0			
Total Lost Time (s)					5.5			5.5	5.5			
Lead/Lag	Lag				Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				2.0		3.0	3.0	3.0			
Recall Mode	None				C-Max		None	None	None			
Walk Time (s)	7.0				7.0		7.0	7.0	7.0			
Flash Dont Walk (s)	9.0				10.0		9.0	9.0	9.0			
Pedestrian Calls (#/hr)	0				0		0	0	0			
Act Effct Green (s)		71.4			54.0			12.1	12.1			
Actuated g/C Ratio		0.71			0.54			0.12	0.12			
v/c Ratio		0.20			0.30			0.40	0.26			
Control Delay		1.1			6.4			33.3	8.5			
Queue Delay		0.5			0.0			0.0	0.0			
Total Delay		1.6			6.4			33.3	8.5			
LOS		A			A			C	A			
Approach Delay		1.6			6.4			25.8				
Approach LOS		A			A			C				

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 16 (16%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 8.2	Intersection LOS: A
Intersection Capacity Utilization 41.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2602: Union & East



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	609	0	0	347	57	43	166	211	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Frt					0.979				0.850			
Flt Protected		0.997						0.990				
Satd. Flow (prot)	0	3529	0	0	3431	0	0	3504	1583	0	0	0
Flt Permitted		0.914						0.990				
Satd. Flow (perm)	0	3235	0	0	3431	0	0	3504	1583	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					19				234			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		148			667			451			567	
Travel Time (s)		3.4			15.2			10.3			12.9	
Peak Hour Factor	0.86	0.86	0.86	0.87	0.87	0.87	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	42	708	0	0	399	66	48	184	234	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	750	0	0	465	0	0	232	234	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1			1		1	1	1			
Detector Template												
Leading Detector (ft)	50	50			50		50	50	50			
Trailing Detector (ft)	0	0			0		0	0	0			
Detector 1 Position(ft)	0	0			0		0	0	0			
Detector 1 Size(ft)	50	50			50		50	50	50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Turn Type	pm+pt	NA			NA		Split	NA	Perm			
Protected Phases	2	1 2			1		3	3				
Permitted Phases	1 2								3			
Detector Phase	2	1 2			1		3	3	3			
Switch Phase												
Minimum Initial (s)	6.0				6.0		6.0	6.0	6.0			
Minimum Split (s)	23.0				23.0		22.0	22.0	22.0			
Total Split (s)	36.0				35.0		29.0	29.0	29.0			
Total Split (%)	36.0%				35.0%		29.0%	29.0%	29.0%			
Maximum Green (s)	30.5				29.5		23.5	23.5	23.5			
Yellow Time (s)	3.5				3.5		3.5	3.5	3.5			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.0				2.0		2.0	2.0	2.0			
Lost Time Adjust (s)					0.0			0.0	0.0			
Total Lost Time (s)					5.5			5.5	5.5			
Lead/Lag	Lag				Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				2.0		3.0	3.0	3.0			
Recall Mode	None				C-Max		None	None	None			
Walk Time (s)	7.0				7.0		7.0	7.0	7.0			
Flash Dont Walk (s)	9.0				10.0		9.0	9.0	9.0			
Pedestrian Calls (#/hr)	0				0		0	0	0			
Act Effct Green (s)		69.7			49.1			13.8	13.8			
Actuated g/C Ratio		0.70			0.49			0.14	0.14			
v/c Ratio		0.32			0.27			0.48	0.56			
Control Delay		1.1			23.9			39.5	11.9			
Queue Delay		0.1			0.0			0.0	0.0			
Total Delay		1.2			23.9			39.5	11.9			
LOS		A			C			D	B			
Approach Delay		1.2			23.9			25.7				
Approach LOS		A			C			C				

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 94 (94%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 48.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2602: Union & East

Lanes, Volumes, Timings
2601: Pitkin & East

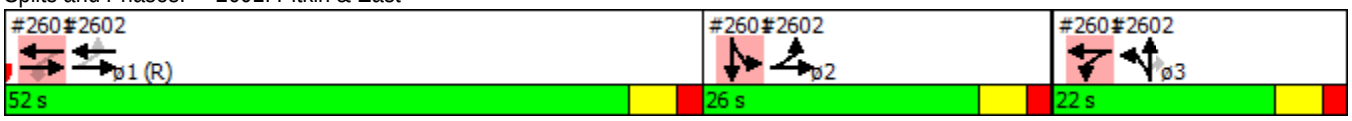
1/7/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	189	30	138	353	0	0	0	0	171	168	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		125	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt			0.850								0.978	
Flt Protected					0.986					0.950		
Satd. Flow (prot)	0	3471	1553	0	3423	0	0	0	0	1736	3395	0
Flt Permitted					0.790					0.950		
Satd. Flow (perm)	0	3471	1553	0	2742	0	0	0	0	1736	3395	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			87								18	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		788			123			435			516	
Travel Time (s)		17.9			2.8			9.9			11.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.90	0.90	0.90	0.80	0.80	0.80
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	2%	2%	2%	4%	4%	4%
Adj. Flow (vph)	0	199	32	145	372	0	0	0	0	214	210	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	199	32	0	517	0	0	0	0	214	246	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		1	1	1	1					1	1	
Detector Template												
Leading Detector (ft)		50	50	50	50					50	50	
Trailing Detector (ft)		0	0	0	0					0	0	
Detector 1 Position(ft)		0	0	0	0					0	0	
Detector 1 Size(ft)		50	50	50	50					50	50	
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Turn Type		NA	Perm	pm+pt	NA					Split	NA	
Protected Phases		1		3	1 3					2	2	
Permitted Phases			1	1 3								
Detector Phase		1	1	3	1 3					2	2	
Switch Phase												
Minimum Initial (s)		6.0	6.0	6.0						6.0	6.0	
Minimum Split (s)		23.0	23.0	22.0						23.0	23.0	
Total Split (s)		52.0	52.0	22.0						26.0	26.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)		52.0%	52.0%	22.0%						26.0%	26.0%	
Maximum Green (s)		46.5	46.5	16.5						20.5	20.5	
Yellow Time (s)		3.5	3.5	3.5						3.5	3.5	
All-Red Time (s)		2.0	2.0	2.0						2.0	2.0	
Lost Time Adjust (s)		0.0	0.0							0.0	0.0	
Total Lost Time (s)		5.5	5.5							5.5	5.5	
Lead/Lag		Lead	Lead							Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0	3.0						3.0	3.0	
Recall Mode		C-Max	C-Max	None						None	None	
Walk Time (s)		7.0	7.0	7.0						7.0	7.0	
Flash Dont Walk (s)		10.0	10.0	9.0						9.0	9.0	
Pedestrian Calls (#/hr)		0	0	0						0	0	
Act Effct Green (s)		54.0	54.0		66.1					17.4	17.4	
Actuated g/C Ratio		0.54	0.54		0.66					0.17	0.17	
v/c Ratio		0.11	0.04		0.27					0.71	0.41	
Control Delay		12.5	2.0		1.1					52.0	35.9	
Queue Delay		0.0	0.0		0.2					0.0	0.0	
Total Delay		12.5	2.0		1.3					52.0	35.9	
LOS		B	A		A					D	D	
Approach Delay		11.0			1.3						43.4	
Approach LOS		B			A						D	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 16 (16%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 19.2	Intersection LOS: B
Intersection Capacity Utilization 42.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2601: Pitkin & East



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	445	51	78	316	0	0	0	0	197	114	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		125	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt			0.850								0.972	
Flt Protected					0.990					0.950		
Satd. Flow (prot)	0	3539	1583	0	3470	0	0	0	0	1770	3440	0
Flt Permitted					0.778					0.950		
Satd. Flow (perm)	0	3539	1583	0	2727	0	0	0	0	1770	3440	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			87								29	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		763			148			439			686	
Travel Time (s)		17.3			3.4			10.0			15.6	
Peak Hour Factor	0.92	0.92	0.92	0.93	0.93	0.93	0.90	0.90	0.90	0.89	0.89	0.89
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	484	55	84	340	0	0	0	0	221	128	30
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	484	55	0	424	0	0	0	0	221	158	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		1	1	1	1					1	1	
Detector Template												
Leading Detector (ft)		50	50	50	50					50	50	
Trailing Detector (ft)		0	0	0	0					0	0	
Detector 1 Position(ft)		0	0	0	0					0	0	
Detector 1 Size(ft)		50	50	50	50					50	50	
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Turn Type		NA	Perm	pm+pt	NA					Split	NA	
Protected Phases		1		3	1 3					2	2	
Permitted Phases			1	1 3								
Detector Phase		1	1	3	1 3					2	2	
Switch Phase												
Minimum Initial (s)		6.0	6.0	6.0						6.0	6.0	
Minimum Split (s)		23.0	23.0	22.0						23.0	23.0	
Total Split (s)		35.0	35.0	29.0						36.0	36.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)		35.0%	35.0%	29.0%						36.0%	36.0%	
Maximum Green (s)		29.5	29.5	23.5						30.5	30.5	
Yellow Time (s)		3.5	3.5	3.5						3.5	3.5	
All-Red Time (s)		2.0	2.0	2.0						2.0	2.0	
Lost Time Adjust (s)		0.0	0.0							0.0	0.0	
Total Lost Time (s)		5.5	5.5							5.5	5.5	
Lead/Lag		Lead	Lead							Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0	3.0						3.0	3.0	
Recall Mode		C-Max	C-Max	None						None	None	
Walk Time (s)		7.0	7.0	7.0						7.0	7.0	
Flash Dont Walk (s)		10.0	10.0	9.0						9.0	9.0	
Pedestrian Calls (#/hr)		0	0	0						0	0	
Act Effct Green (s)		49.1	49.1		62.9					20.6	20.6	
Actuated g/C Ratio		0.49	0.49		0.63					0.21	0.21	
v/c Ratio		0.28	0.07		0.23					0.61	0.22	
Control Delay		12.5	0.3		5.9					45.1	28.5	
Queue Delay		0.0	0.0		0.1					0.0	0.0	
Total Delay		12.5	0.3		6.0					45.1	28.5	
LOS		B	A		A					D	C	
Approach Delay		11.2			6.0						38.2	
Approach LOS		B			A						D	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 94 (94%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 17.2	Intersection LOS: B
Intersection Capacity Utilization 48.0%	ICU Level of Service A
Analysis Period (min) 15	

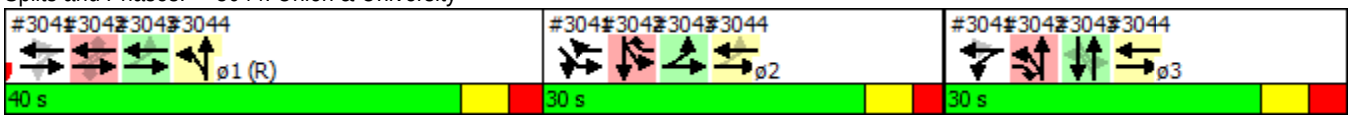
Splits and Phases: 2601: Pitkin & East

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	353	0	0	470	37	118	152	60	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	0.91	0.91	0.91	1.00	1.00	1.00
Frt					0.989			0.973				
Flt Protected		0.999						0.982				
Satd. Flow (prot)	0	3468	0	0	3368	0	0	4676	0	0	0	0
Flt Permitted		0.940						0.982				
Satd. Flow (perm)	0	3263	0	0	3368	0	0	4676	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					13			55				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		316			584			383			361	
Travel Time (s)		7.2			13.3			8.7			8.2	
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.92	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	6%	6%	6%	6%	6%	6%	2%	2%	2%
Adj. Flow (vph)	10	401	0	0	511	40	131	169	67	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	411	0	0	551	0	0	367	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1			1		1	1				
Detector Template												
Leading Detector (ft)	50	50			50		50	50				
Trailing Detector (ft)	0	0			0		0	0				
Detector 1 Position(ft)	0	0			0		0	0				
Detector 1 Size(ft)	50	50			50		50	50				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0				
Turn Type	custom	NA			NA		Split	NA				
Protected Phases		2 3			2 3		1	1				
Permitted Phases	2				2 3							
Detector Phase	2	2 3			2 3		1	1				
Switch Phase												
Minimum Initial (s)	6.0						7.0	7.0				
Minimum Split (s)	15.0						30.0	30.0				
Total Split (s)	30.0						40.0	40.0				
Total Split (%)	30.0%						40.0%	40.0%				
Maximum Green (s)	24.0						34.0	34.0				
Yellow Time (s)	3.5						3.5	3.5				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.5						2.5	2.5				
Lost Time Adjust (s)								0.0				
Total Lost Time (s)								6.0				
Lead/Lag	Lag						Lead	Lead				
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0						3.0	3.0				
Recall Mode	None						C-Max	C-Max				
Walk Time (s)							7.0	7.0				
Flash Dont Walk (s)							16.0	16.0				
Pedestrian Calls (#/hr)							0	0				
Act Effct Green (s)		54.0			54.0			34.0				
Actuated g/C Ratio		0.54			0.54			0.34				
v/c Ratio		0.23			0.30			0.23				
Control Delay		4.6			3.6			15.9				
Queue Delay		0.0			0.0			0.0				
Total Delay		4.6			3.6			15.9				
LOS		A			A			B				
Approach Delay		4.6			3.6			15.9				
Approach LOS		A			A			B				

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 38 (38%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 7.3	Intersection LOS: A
Intersection Capacity Utilization 32.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3044: Union & University



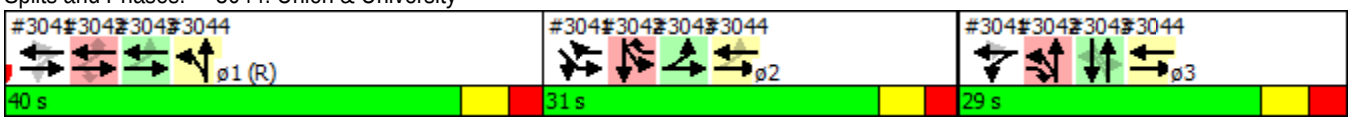
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	526	0	0	424	30	208	237	116	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00
Frt					0.990			0.951				
Flt Protected		0.999					0.950					
Satd. Flow (prot)	0	3536	0	0	3504	0	1770	3366	0	0	0	0
Flt Permitted		0.948					0.950					
Satd. Flow (perm)	0	3355	0	0	3504	0	1770	3366	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					11			91				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		298			584			576			361	
Travel Time (s)		6.8			13.3			13.1			8.2	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.86	0.86	0.86	0.90	0.90	0.90
Adj. Flow (vph)	8	674	0	0	544	38	242	276	135	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	682	0	0	582	0	242	411	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1			1		1	1				
Detector Template												
Leading Detector (ft)	50	50			50		50	50				
Trailing Detector (ft)	0	0			0		0	0				
Detector 1 Position(ft)	0	0			0		0	0				
Detector 1 Size(ft)	50	50			50		50	50				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0				
Turn Type	custom	NA			NA		Split	NA				
Protected Phases		2 3			2 3		1	1				
Permitted Phases	2				2 3							
Detector Phase	2	2 3			2 3		1	1				
Switch Phase												
Minimum Initial (s)	6.0						7.0	7.0				
Minimum Split (s)	15.0						30.0	30.0				
Total Split (s)	31.0						40.0	40.0				
Total Split (%)	31.0%						40.0%	40.0%				
Maximum Green (s)	25.0						34.0	34.0				
Yellow Time (s)	3.5						3.5	3.5				
All-Red Time (s)	2.5						2.5	2.5				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjust (s)							0.0	0.0				
Total Lost Time (s)							6.0	6.0				
Lead/Lag	Lag						Lead	Lead				
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0						3.0	3.0				
Recall Mode	None						C-Max	C-Max				
Walk Time (s)							7.0	7.0				
Flash Dont Walk (s)							16.0	16.0				
Pedestrian Calls (#/hr)							0	0				
Act Effct Green (s)		54.0			54.0		34.0	34.0				
Actuated g/C Ratio		0.54			0.54		0.34	0.34				
v/c Ratio		0.38			0.31		0.40	0.34				
Control Delay		7.0			8.5		34.5	25.9				
Queue Delay		0.8			0.0		0.0	0.0				
Total Delay		7.8			8.5		34.5	25.9				
LOS		A			A		C	C				
Approach Delay		7.8			8.5			29.1				
Approach LOS		A			A			C				

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 51 (51%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 15.3 Intersection LOS: B
Intersection Capacity Utilization 40.3% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3044: Union & University

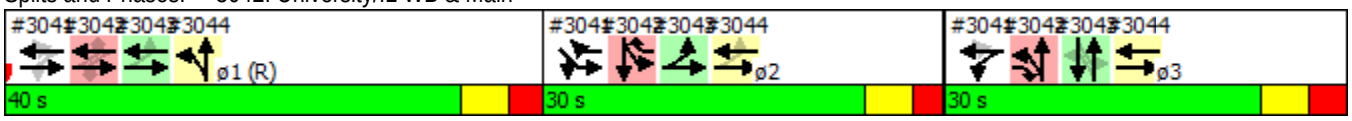


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	292	148	1	680	445	239	369	3	425	341	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	0		0	0		0	250		250
Storage Lanes	1		1	0		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	0.95	0.95	1.00	0.91	0.91	0.95	0.91	0.91	0.95
Frt		0.992	0.850			0.850		0.999			0.997	
Flt Protected	0.950						0.950	0.995		0.950	0.984	
Satd. Flow (prot)	1597	3036	1301	0	3312	1482	1579	3305	0	1507	3112	0
Flt Permitted	0.228				0.955		0.950	0.995		0.950	0.984	
Satd. Flow (perm)	383	3036	1301	0	3163	1482	1579	3305	0	1507	3112	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6	142			82		1			2	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		297			291			316			393	
Travel Time (s)		6.8			6.6			7.2			8.9	
Peak Hour Factor	0.87	0.87	0.87	0.90	0.90	0.90	0.81	0.81	0.81	0.92	0.92	0.92
Heavy Vehicles (%)	13%	13%	13%	9%	9%	9%	4%	4%	4%	9%	9%	9%
Adj. Flow (vph)	10	336	170	1	756	494	295	456	4	462	371	11
Shared Lane Traffic (%)			11%				17%			40%		
Lane Group Flow (vph)	10	355	151	0	757	494	245	510	0	277	567	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50	50	50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	50	50	50	50	50	50	50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Split	NA		Split	NA	
Protected Phases		1	3		1	2	3	3		2	2	
Permitted Phases	1		1	1		1						
Detector Phase	1	1	3	1	1	2	3	3		2	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	6.0	7.0	7.0	6.0	6.0	6.0		6.0	6.0	
Minimum Split (s)	30.0	30.0	15.0	30.0	30.0	15.0	15.0	15.0		15.0	15.0	
Total Split (s)	40.0	40.0	30.0	40.0	40.0	30.0	30.0	30.0		30.0	30.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	40.0%	40.0%	30.0%	40.0%	40.0%	30.0%	30.0%	30.0%		30.0%	30.0%	
Maximum Green (s)	34.0	34.0	23.5	34.0	34.0	24.0	23.5	23.5		24.0	24.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	2.5	2.5	3.0	2.5	2.5	2.5	3.0	3.0		2.5	2.5	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.5		6.0	6.0	6.5	6.5		6.0	6.0	
Lead/Lag	Lead	Lead		Lead	Lead	Lag				Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	None	C-Max	C-Max	None	None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0							
Flash Dont Walk (s)	16.0	16.0		16.0	16.0							
Pedestrian Calls (#/hr)	0	0		0	0							
Act Effct Green (s)	34.0	34.0	63.5		34.0	64.0	23.5	23.5		24.0	24.0	
Actuated g/C Ratio	0.34	0.34	0.64		0.34	0.64	0.24	0.24		0.24	0.24	
v/c Ratio	0.08	0.34	0.17		0.70	0.51	0.66	0.66		0.77	0.76	
Control Delay	23.8	23.4	5.5		9.0	4.9	38.8	33.7		51.1	42.7	
Queue Delay	0.0	0.0	0.0		0.2	2.4	1.0	0.7		0.0	0.0	
Total Delay	23.8	23.4	5.5		9.2	7.3	39.8	34.4		51.1	42.7	
LOS	C	C	A		A	A	D	C		D	D	
Approach Delay		18.2			8.4			36.2			45.4	
Approach LOS		B			A			D			D	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 38 (38%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 25.4	Intersection LOS: C
Intersection Capacity Utilization 64.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3042: University/IL WB & Main

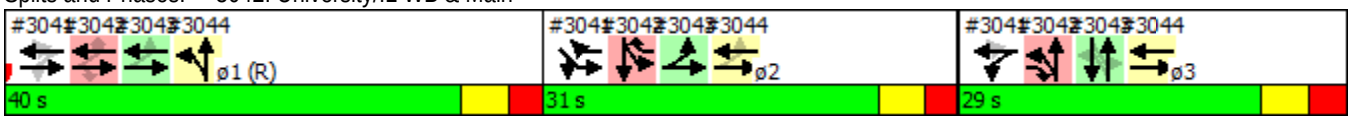


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	18	530	215	0	525	430	230	418	1	398	316	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	0		0	0		0	250		250
Storage Lanes	1		1	0		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	0.91	0.91	0.95	0.91	0.91	0.95
Frt		0.994	0.850			0.850					0.998	
Flt Protected	0.950						0.950	0.997		0.950	0.983	
Satd. Flow (prot)	1736	3305	1413	0	3438	1538	1610	3380	0	1595	3294	0
Flt Permitted	0.349						0.950	0.997		0.950	0.983	
Satd. Flow (perm)	638	3305	1413	0	3438	1538	1610	3380	0	1595	3294	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4	154			56					1	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		298			291			298			403	
Travel Time (s)		6.8			6.6			6.8			9.2	
Peak Hour Factor	0.83	0.83	0.83	0.93	0.93	0.93	0.84	0.84	0.84	0.85	0.85	0.85
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	2%	2%	2%	3%	3%	3%
Adj. Flow (vph)	22	639	259	0	565	462	274	498	1	468	372	6
Shared Lane Traffic (%)			10%				10%			41%		
Lane Group Flow (vph)	22	665	233	0	565	462	247	526	0	276	570	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1		1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50		50	50	50	50		50	50	
Trailing Detector (ft)	0	0	0		0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0		0	0	0	0		0	0	
Detector 1 Size(ft)	50	50	50		50	50	50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	Perm	NA	pm+ov		NA	pm+ov	Split	NA		Split	NA	
Protected Phases		1	3		1	2	3	3		2	2	
Permitted Phases	1		1			1						
Detector Phase	1	1	3		1	2	3	3		2	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	6.0		7.0	6.0	6.0	6.0		6.0	6.0	
Minimum Split (s)	30.0	30.0	15.0		30.0	15.0	15.0	15.0		15.0	15.0	
Total Split (s)	40.0	40.0	29.0		40.0	31.0	29.0	29.0		31.0	31.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	40.0%	40.0%	29.0%		40.0%	31.0%	29.0%	29.0%		31.0%	31.0%	
Maximum Green (s)	34.0	34.0	22.5		34.0	25.0	22.5	22.5		25.0	25.0	
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	2.5	2.5	3.0		2.5	2.5	3.0	3.0		2.5	2.5	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.5		6.0	6.0	6.5	6.5		6.0	6.0	
Lead/Lag	Lead	Lead			Lead	Lag				Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	None		C-Max	None	None	None		None	None	
Walk Time (s)	7.0	7.0			7.0							
Flash Dont Walk (s)	16.0	16.0			16.0							
Pedestrian Calls (#/hr)	0	0			0							
Act Effct Green (s)	34.0	34.0	62.5		34.0	65.0	22.5	22.5		25.0	25.0	
Actuated g/C Ratio	0.34	0.34	0.62		0.34	0.65	0.22	0.22		0.25	0.25	
v/c Ratio	0.10	0.59	0.25		0.48	0.45	0.68	0.69		0.69	0.69	
Control Delay	17.2	18.7	4.0		11.5	1.2	40.0	34.9		44.5	39.1	
Queue Delay	0.0	0.5	0.5		0.8	2.4	2.5	1.8		0.0	0.0	
Total Delay	17.2	19.2	4.5		12.2	3.7	42.5	36.8		44.5	39.1	
LOS	B	B	A		B	A	D	D		D	D	
Approach Delay		15.4			8.4			38.6			40.8	
Approach LOS		B			A			D			D	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 51 (51%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 24.4	Intersection LOS: C
Intersection Capacity Utilization 60.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3042: University/IL WB & Main

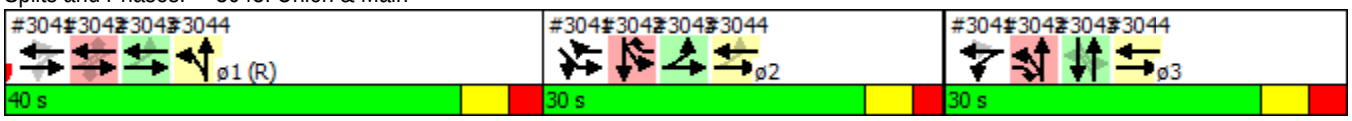


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	52	671	0	0	1034	24	4	88	105	29	0	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00
Frt					0.997			0.919			0.898	
Flt Protected	0.950						0.950				0.988	
Satd. Flow (prot)	1641	4715	0	0	4879	0	1597	2936	0	0	1492	0
Flt Permitted	0.137						0.664				0.871	
Satd. Flow (perm)	237	4715	0	0	4879	0	1116	2936	0	0	1315	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					4			115			100	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		291			715			361			297	
Travel Time (s)		6.6			16.3			8.2			6.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.91	0.91	0.91	0.88	0.88	0.88
Heavy Vehicles (%)	10%	10%	10%	6%	6%	6%	13%	13%	13%	13%	13%	13%
Adj. Flow (vph)	57	729	0	0	1124	26	4	97	115	33	0	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	729	0	0	1150	0	4	212	0	0	133	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1			1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50			50		50	50		50	50	
Trailing Detector (ft)	0	0			0		0	0		0	0	
Detector 1 Position(ft)	0	0			0		0	0		0	0	
Detector 1 Size(ft)	50	50			50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA			NA		Perm	NA		Perm	NA	
Protected Phases	2	1 2			1			3			3	
Permitted Phases	1 2						3			3		
Detector Phase	2	1 2			1		3	3		3	3	
Switch Phase												
Minimum Initial (s)	6.0				7.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	15.0				30.0		15.0	15.0		15.0	15.0	
Total Split (s)	30.0				40.0		30.0	30.0		30.0	30.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	30.0%				40.0%		30.0%	30.0%		30.0%	30.0%	
Maximum Green (s)	24.0				34.0		23.5	23.5		23.5	23.5	
Yellow Time (s)	3.5				3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.5				2.5		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0				0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0				6.0		6.5	6.5			6.5	
Lead/Lag	Lag				Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				3.0		3.0	3.0		3.0	3.0	
Recall Mode	None				C-Max		None	None		None	None	
Walk Time (s)					7.0							
Flash Dont Walk (s)					16.0							
Pedestrian Calls (#/hr)					0							
Act Effct Green (s)	58.0	64.0			34.0		23.5	23.5			23.5	
Actuated g/C Ratio	0.58	0.64			0.34		0.24	0.24			0.24	
v/c Ratio	0.12	0.24			0.69		0.02	0.27			0.35	
Control Delay	4.7	3.1			27.2		44.5	32.4			13.1	
Queue Delay	0.0	0.2			0.0		0.0	0.0			0.0	
Total Delay	4.7	3.3			27.2		44.5	32.4			13.1	
LOS	A	A			C		D	C			B	
Approach Delay		3.4			27.2			32.6			13.1	
Approach LOS		A			C			C			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 38 (38%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 18.7	Intersection LOS: B
Intersection Capacity Utilization 59.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3043: Union & Main



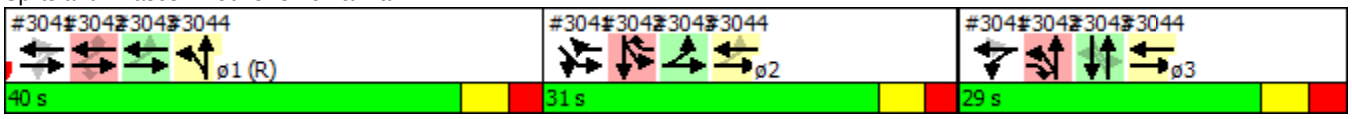
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	52	881	0	0	902	62	5	100	195	28	0	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	1.00	*0.60	0.91	1.00	0.95	0.95	1.00	1.00	1.00
Frt					0.990			0.901			0.915	
Flt Protected	0.950						0.950				0.982	
Satd. Flow (prot)	1752	5036	0	0	3256	0	1770	3189	0	0	1642	0
Flt Permitted	0.118						0.730				0.775	
Satd. Flow (perm)	218	5036	0	0	3256	0	1360	3189	0	0	1296	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					7			144			98	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		291			715			361			297	
Travel Time (s)		6.6			16.3			8.2			6.8	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.92	0.92	0.92	0.78	0.78	0.78
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	4%	4%	4%
Adj. Flow (vph)	59	1001	0	0	1025	70	5	109	212	36	0	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	1001	0	0	1095	0	5	321	0	0	98	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1			1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50			50		50	50		50	50	
Trailing Detector (ft)	0	0			0		0	0		0	0	
Detector 1 Position(ft)	0	0			0		0	0		0	0	
Detector 1 Size(ft)	50	50			50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA			NA		Perm	NA		Perm	NA	
Protected Phases	2	1 2			1			3			3	
Permitted Phases	1 2						3			3		
Detector Phase	2	1 2			1		3	3		3	3	
Switch Phase												
Minimum Initial (s)	6.0				7.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	15.0				30.0		15.0	15.0		15.0	15.0	
Total Split (s)	31.0				40.0		29.0	29.0		29.0	29.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	31.0%				40.0%		29.0%	29.0%		29.0%	29.0%	
Maximum Green (s)	25.0				34.0		22.5	22.5		22.5	22.5	
Yellow Time (s)	3.5				3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.5				2.5		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0				0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0				6.0		6.5	6.5			6.5	
Lead/Lag	Lag				Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				3.0		3.0	3.0		3.0	3.0	
Recall Mode	None				C-Max		None	None		None	None	
Walk Time (s)					7.0							
Flash Dont Walk (s)					16.0							
Pedestrian Calls (#/hr)					0							
Act Effct Green (s)	59.0	65.0			34.0		22.5	22.5			22.5	
Actuated g/C Ratio	0.59	0.65			0.34		0.22	0.22			0.22	
v/c Ratio	0.12	0.31			0.99		0.02	0.39			0.27	
Control Delay	2.8	1.8			50.4		47.8	34.8			8.7	
Queue Delay	0.0	0.2			0.0		0.0	0.0			0.0	
Total Delay	2.8	2.0			50.4		47.8	34.8			8.7	
LOS	A	A			D		D	C			A	
Approach Delay		2.0			50.4			35.0			8.7	
Approach LOS		A			D			D			A	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 51 (51%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 27.0	Intersection LOS: C
Intersection Capacity Utilization 58.7%	ICU Level of Service B
Analysis Period (min) 15	

* User Entered Value

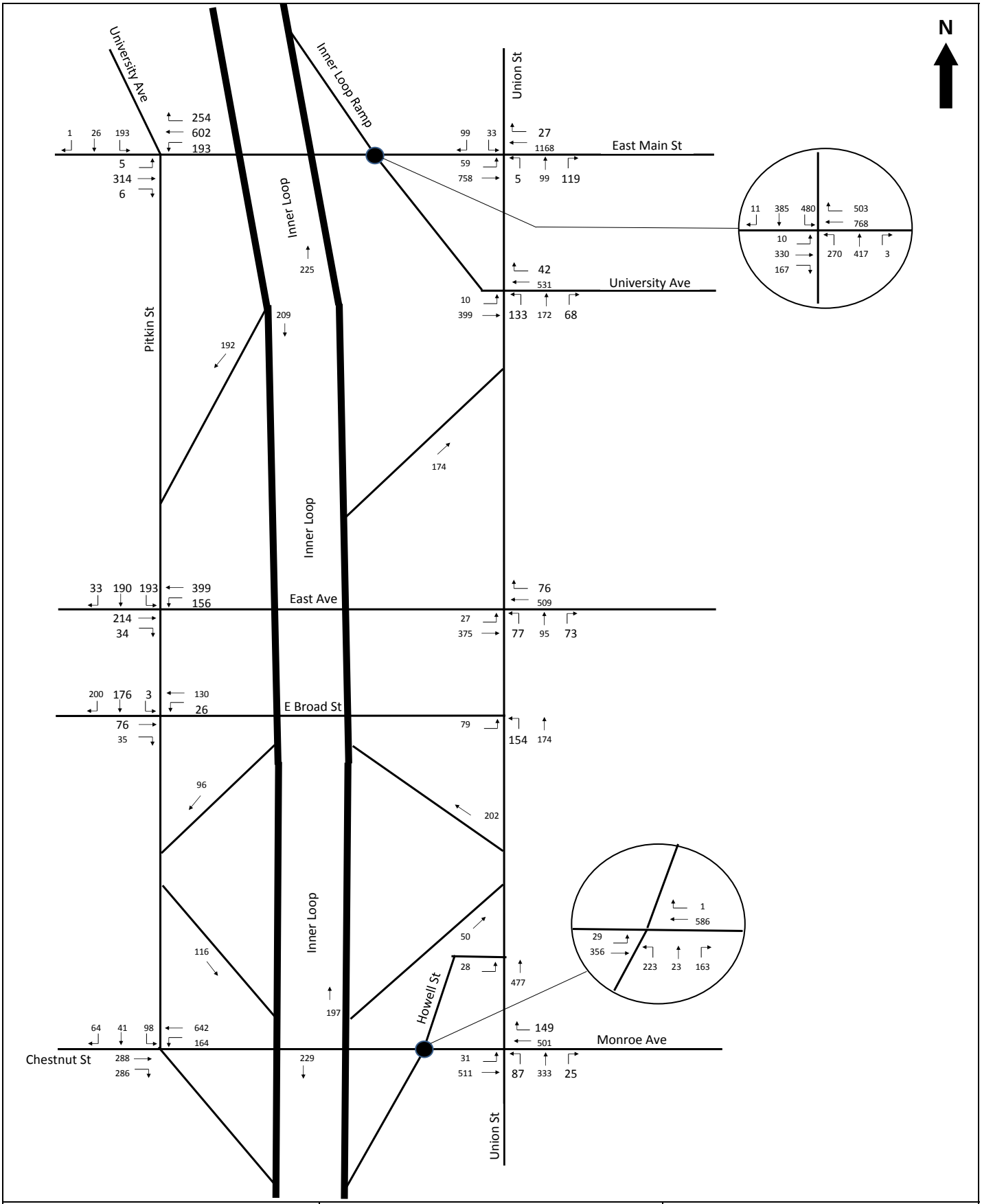
Splits and Phases: 3043: Union & Main



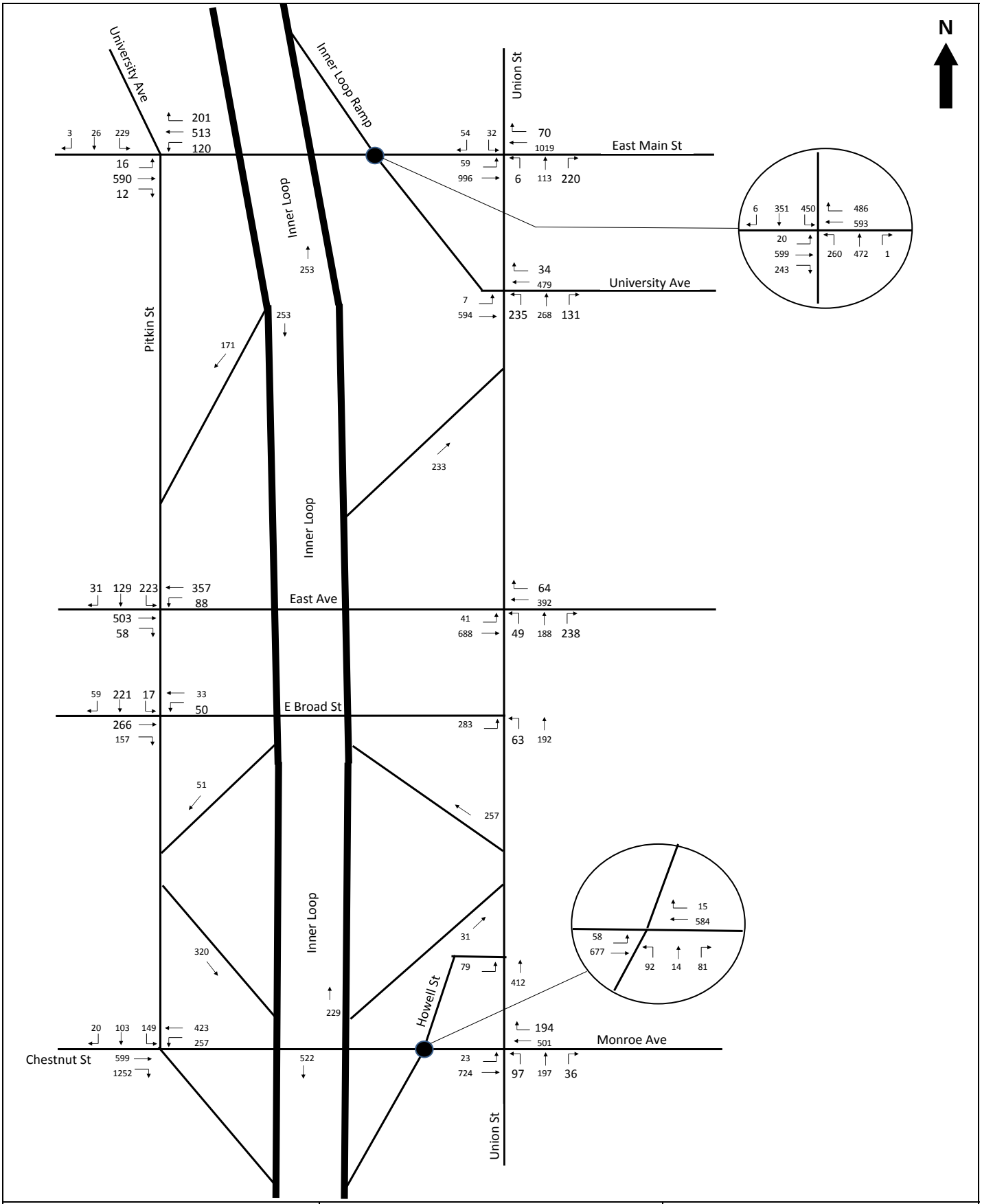
Appendix G – Traffic Analysis
Contents

2035 No Build Conditions

- **2035 No Build Traffic Volumes**
- **2035 No Build Capacity Analysis Printouts**
- **Synchro Files (available upon request)**



Stantec 61 Commercial Street Rochester, New York 14614 T: (585) 475-1440	**ROCHESTER INNER LOOP**	**2035 No Build Traffic Volumes** **AM Peak Hour (7:30 AM - 8:30 AM)**



Stantec 61 Commercial Street Rochester, New York 14614 T: (585) 475-1440	**ROCHESTER INNER LOOP**	**2035 No Build Traffic Volumes** **PM Peak Hour (4:30 AM - 5:30 AM)**

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	197	20	144	0	0	0	26	315	0	0	519	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	0		0	0		50
Storage Lanes	0		1	0		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95
Frt			0.850									
Flt Protected		0.957						0.996				
Satd. Flow (prot)	0	1715	1524	0	0	0	0	3525	0	0	3539	0
Flt Permitted		0.957						0.897				
Satd. Flow (perm)	0	1715	1524	0	0	0	0	3175	0	0	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			203									
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		768			258			174			411	
Travel Time (s)		17.5			5.9			4.0			9.3	
Peak Hour Factor	0.80	0.80	0.80	0.90	0.95	0.90	0.92	0.92	0.92	0.94	0.94	0.94
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Heavy Vehicles (%)	6%	6%	6%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	278	28	203	0	0	0	32	387	0	0	624	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	306	203	0	0	0	0	419	0	0	625	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1				1	2			2	
Detector Template	Left		Right				Left	Thru			Thru	
Leading Detector (ft)	20	50	20				20	100			100	
Trailing Detector (ft)	0	0	0				0	0			0	
Detector 1 Position(ft)	0	0	0				0	0			0	
Detector 1 Size(ft)	20	50	20				20	6			6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex				Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0				0.0	0.0			0.0	
Detector 1 Queue (s)	0.0	0.0	0.0				0.0	0.0			0.0	
Detector 1 Delay (s)	0.0	0.0	0.0				0.0	0.0			0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type	Split	NA	Perm				pm+pt	NA			NA	
Protected Phases	2	2					3	1 3			1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Permitted Phases			2				1 3				1	
Detector Phase	2	2	2				3	1 3			1	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0				3.0				3.0	
Minimum Split (s)	32.0	32.0	32.0				25.0				25.0	
Total Split (s)	32.0	32.0	32.0				25.0				28.0	
Total Split (%)	37.6%	37.6%	37.6%				29.4%				32.9%	
Maximum Green (s)	27.0	27.0	27.0				20.0				23.0	
Yellow Time (s)	4.0	4.0	4.0				4.0				4.0	
All-Red Time (s)	1.0	1.0	1.0				1.0				1.0	
Lost Time Adjust (s)		0.0	0.0								0.0	
Total Lost Time (s)		5.0	5.0								5.0	
Lead/Lag	Lag	Lag	Lag								Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0				3.0				3.0	
Recall Mode	Min	Min	Min				None				C-Max	
Walk Time (s)	7.0	7.0	7.0				5.0				5.0	
Flash Dont Walk (s)	18.0	18.0	18.0				15.0				15.0	
Pedestrian Calls (#/hr)	0	0	0				0				0	
Act Effct Green (s)		20.4	20.4					49.6			39.4	
Actuated g/C Ratio		0.24	0.24					0.58			0.46	
v/c Ratio		0.74	0.39					0.22			0.38	
Control Delay		40.6	5.8					7.5			17.4	
Queue Delay		0.0	0.0					0.3			0.0	
Total Delay		40.6	5.8					7.8			17.4	
LOS		D	A					A			B	
Approach Delay		26.7						7.8			17.4	
Approach LOS		C						A			B	

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 73 (86%), Referenced to phase 1:NWSE, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 17.9 Intersection LOS: B
Intersection Capacity Utilization 53.0% ICU Level of Service A
Analysis Period (min) 15

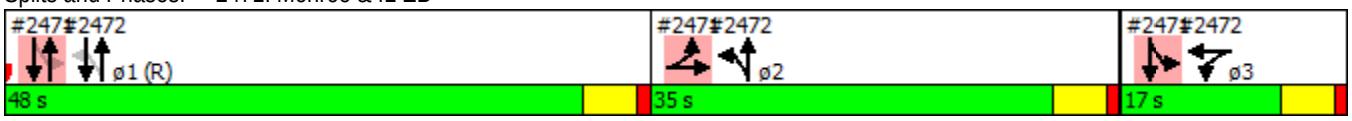
Splits and Phases: 2471: IL EB

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	81	12	72	0	0	0	0	517	13	51	599	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	0		0	0		50	0		0
Storage Lanes	1		0	0		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	1.00
Frt		0.871						0.996				
Flt Protected	0.950										0.996	
Satd. Flow (prot)	1787	1639	0	0	0	0	0	3525	0	0	3525	0
Flt Permitted	0.950										0.857	
Satd. Flow (perm)	1787	1639	0	0	0	0	0	3525	0	0	3033	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		102						3				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		324			342			409			178	
Travel Time (s)		7.4			7.8			9.3			4.0	
Peak Hour Factor	0.80	0.80	0.80	0.95	0.95	0.95	0.95	0.95	0.95	0.90	0.90	0.90
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	114	17	102	0	0	0	0	615	15	64	752	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	114	119	0	0	0	0	0	630	0	0	816	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1						1		1	1	
Detector Template												
Leading Detector (ft)	50	50						50		50	50	
Trailing Detector (ft)	0	0						0		0	0	
Detector 1 Position(ft)	0	0						0		0	0	
Detector 1 Size(ft)	50	50						50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex						Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0						0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0						0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0						0.0		0.0	0.0	
Turn Type	Split	NA						NA		pm+pt	NA	
Protected Phases	2	2						1		3	1 3	
Permitted Phases								1		1 3		
Detector Phase	2	2						1		3	1 3	
Switch Phase												
Minimum Initial (s)	6.0	6.0						7.0		6.0		
Minimum Split (s)	32.0	32.0						27.0		11.0		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	35.0	35.0						48.0		17.0		
Total Split (%)	35.0%	35.0%						48.0%		17.0%		
Maximum Green (s)	30.0	30.0						43.0		12.0		
Yellow Time (s)	4.0	4.0						4.0		4.0		
All-Red Time (s)	1.0	1.0						1.0		1.0		
Lost Time Adjust (s)	0.0	0.0						0.0				
Total Lost Time (s)	5.0	5.0						5.0				
Lead/Lag	Lag	Lag						Lead				
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0						2.0		3.0		
Recall Mode	Min	Min						C-Max		None		
Walk Time (s)	7.0	7.0						7.0				
Flash Dont Walk (s)	18.0	18.0						15.0				
Pedestrian Calls (#/hr)	0	0						0				
Act Effct Green (s)	13.7	13.7						55.6			71.3	
Actuated g/C Ratio	0.14	0.14						0.56			0.71	
v/c Ratio	0.47	0.38						0.32			0.36	
Control Delay	44.5	13.4						13.2			1.9	
Queue Delay	0.0	0.0						0.0			0.1	
Total Delay	44.5	13.4						13.3			2.0	
LOS	D	B						B			A	
Approach Delay		28.6						13.3			2.0	
Approach LOS		C						B			A	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 65 (65%), Referenced to phase 1:NBSB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 9.9	Intersection LOS: A
Intersection Capacity Utilization 55.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2471: Monroe & IL EB



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR
Lane Configurations										
Volume (vph)	0	0	0	87	36	57	255	253	145	568
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.91	0.97	0.88	1.00	0.95
Frt					0.952			0.850	0.912	0.850
Flt Protected					0.976		0.950		0.980	
Satd. Flow (prot)	0	0	0	0	4634	0	3433	2787	1665	1504
Flt Permitted					0.976		0.950		0.741	
Satd. Flow (perm)	0	0	0	0	4634	0	3433	2787	1259	1504
Right Turn on Red			Yes			Yes		Yes		
Satd. Flow (RTOR)					81			304		
Link Speed (mph)		30			30		30		30	
Link Distance (ft)		470			260		648		174	
Travel Time (s)		10.7			5.9		14.7		4.0	
Peak Hour Factor	0.90	0.90	0.90	0.80	0.80	0.80	0.94	0.94	0.88	0.88
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	2%	2%	2%	2%
Adj. Flow (vph)	0	0	0	123	51	81	307	304	186	729
Shared Lane Traffic (%)										36%
Lane Group Flow (vph)	0	0	0	0	255	0	307	304	448	467
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Right	Left	Right
Median Width(ft)		0			0		36		12	
Link Offset(ft)		0			0		0		0	
Crosswalk Width(ft)		16			16		16		16	
Two way Left Turn Lane										
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	30	25	15	9
Number of Detectors				1	2		1	1	1	1
Detector Template				Left	Thru		Left	Right	Left	Right
Leading Detector (ft)				20	100		20	20	20	20
Trailing Detector (ft)				0	0		0	0	0	0
Detector 1 Position(ft)				0	0		0	0	0	0
Detector 1 Size(ft)				20	6		20	20	20	20
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel										
Detector 1 Extend (s)				0.0	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)				0.0	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)				0.0	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(ft)					94					
Detector 2 Size(ft)					6					
Detector 2 Type					Cl+Ex					
Detector 2 Channel										
Detector 2 Extend (s)					0.0					
Turn Type				Split	NA		Prot	Free	D.P+P	pt+ov
Protected Phases				3	3		1		2	1 2
Permitted Phases								Free	1 2	
Detector Phase				3	3		1		2	1 2
Switch Phase										

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR
Minimum Initial (s)				3.0	3.0		3.0		3.0	
Minimum Split (s)				25.0	25.0		25.0		25.0	
Total Split (s)				25.0	25.0		25.0		25.0	
Total Split (%)				33.3%	33.3%		33.3%		33.3%	
Maximum Green (s)				20.0	20.0		20.0		20.0	
Yellow Time (s)				3.0	3.0		3.0		3.0	
All-Red Time (s)				2.0	2.0		2.0		2.0	
Lost Time Adjust (s)					0.0		0.0		0.0	
Total Lost Time (s)					5.0		5.0		5.0	
Lead/Lag							Lead		Lag	
Lead-Lag Optimize?										
Vehicle Extension (s)				3.0	3.0		3.0		3.0	
Recall Mode				None	None		C-Max		Max	
Walk Time (s)				5.0	5.0		5.0		5.0	
Flash Dont Walk (s)				15.0	15.0		15.0		15.0	
Pedestrian Calls (#/hr)				0	0		0		0	
Act Effct Green (s)					8.2		31.8	75.0	51.8	56.8
Actuated g/C Ratio					0.11		0.42	1.00	0.69	0.76
v/c Ratio					0.44		0.21	0.11	0.46	0.41
Control Delay					23.2		14.6	0.1	5.8	4.7
Queue Delay					0.0		0.0	0.0	3.9	10.2
Total Delay					23.2		14.6	0.1	9.7	14.9
LOS					C		B	A	A	B
Approach Delay					23.2		7.4		12.4	
Approach LOS					C		A		B	

Intersection Summary	
Area Type: Other	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 65 (87%), Referenced to phase 1:NWSBL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.46	
Intersection Signal Delay: 12.2	Intersection LOS: B
Intersection Capacity Utilization 48.4%	ICU Level of Service A
Analysis Period (min) 15	

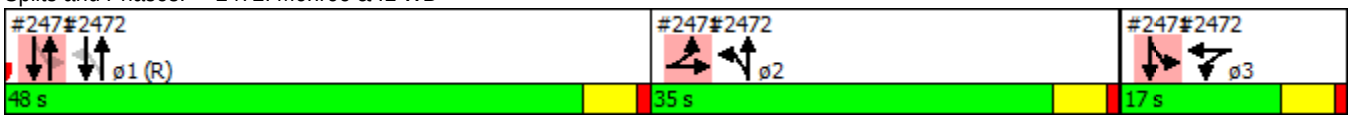
Splits and Phases: 571:

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	132	91	18	227	374	0	0	530	1108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.91	0.95	0.95	1.00	1.00	0.95	0.88
Frt					0.989							0.850
Flt Protected					0.973			0.981				
Satd. Flow (prot)	0	0	0	0	4894	0	0	3472	0	0	3539	2787
Flt Permitted					0.973			0.607				
Satd. Flow (perm)	0	0	0	0	4894	0	0	2148	0	0	3539	2787
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					10							1111
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		410			1028			178			627	
Travel Time (s)		9.3			23.4			4.0			14.3	
Peak Hour Factor	0.95	0.95	0.95	0.92	0.92	0.92	0.94	0.94	0.94	0.91	1.00	0.91
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	0	0	162	112	22	273	450	0	0	599	1376
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	296	0	0	723	0	0	599	1376
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		25
Number of Detectors				1	1		1	1			1	1
Detector Template												
Leading Detector (ft)				50	50		50	50			50	50
Trailing Detector (ft)				0	0		0	0			0	0
Detector 1 Position(ft)				0	0		0	0			0	0
Detector 1 Size(ft)				50	50		50	50			50	50
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0	0.0		0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0	0.0		0.0	0.0			0.0	0.0
Turn Type				Split	NA		pm+pt	NA			NA	Free
Protected Phases				3	3		2	1 2			1	
Permitted Phases							1 2					Free
Detector Phase				3	3		2	1 2			1	
Switch Phase												
Minimum Initial (s)				6.0	6.0		6.0				7.0	
Minimum Split (s)				11.0	11.0		32.0				27.0	
Total Split (s)				17.0	17.0		35.0				48.0	
Total Split (%)				17.0%	17.0%		35.0%				48.0%	
Maximum Green (s)				12.0	12.0		30.0				43.0	
Yellow Time (s)				4.0	4.0		4.0				4.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)				1.0	1.0		1.0				1.0	
Lost Time Adjust (s)					0.0						0.0	
Total Lost Time (s)					5.0						5.0	
Lead/Lag							Lag				Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0				2.0	
Recall Mode				None	None		Min				C-Max	
Walk Time (s)							7.0				7.0	
Flash Dont Walk (s)							18.0				15.0	
Pedestrian Calls (#/hr)							0				0	
Act Effct Green (s)					15.6			69.4			55.6	100.0
Actuated g/C Ratio					0.16			0.69			0.56	1.00
v/c Ratio					0.38			0.43			0.30	0.49
Control Delay					37.6			3.6			12.3	0.4
Queue Delay					0.0			0.0			0.0	0.0
Total Delay					37.6			3.6			12.3	0.4
LOS					D			A			B	A
Approach Delay					37.6			3.6			4.0	
Approach LOS					D			A			A	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 65 (65%), Referenced to phase 1:NBSB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 7.2	Intersection LOS: A
Intersection Capacity Utilization 56.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2472: Monroe & IL WB



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	27	452	0	0	443	132	77	295	22	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		50	250		250	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00
Frt					0.996	0.850		0.989				
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1719	1810	0	0	1729	1475	1752	3466	0	0	0	0
Flt Permitted	0.285						0.950					
Satd. Flow (perm)	516	1810	0	0	1729	1475	1752	3466	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					4	93		9				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		236			714			600			597	
Travel Time (s)		5.4			16.2			13.6			13.6	
Peak Hour Factor	0.85	0.85	0.85	0.90	0.90	0.90	0.90	0.90	0.90	0.95	0.95	0.90
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	36	601	0	0	556	166	97	370	28	0	0	0
Shared Lane Traffic (%)						10%						
Lane Group Flow (vph)	36	601	0	0	573	149	97	398	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2	1	1	1				
Detector Template	Left	Thru			Thru		Left					
Leading Detector (ft)	20	100			100	50	20	50				
Trailing Detector (ft)	0	0			0	0	0	0				
Detector 1 Position(ft)	0	0			0	0	0	0				
Detector 1 Size(ft)	20	6			6	50	20	50				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0	0.0				
Detector 2 Position(ft)		94			94							
Detector 2 Size(ft)		6			6							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type	D.Pm	NA			NA	Perm	Perm	NA				
Protected Phases					4			2				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4	4				4	2					
Detector Phase	4	4			4	4	2	2				
Switch Phase												
Minimum Initial (s)	3.0	3.0			3.0	3.0	9.0	9.0				
Minimum Split (s)	25.0	25.0			25.0	25.0	22.0	22.0				
Total Split (s)	54.0	54.0			54.0	54.0	26.0	26.0				
Total Split (%)	67.5%	67.5%			67.5%	67.5%	32.5%	32.5%				
Maximum Green (s)	49.0	49.0			49.0	49.0	21.0	21.0				
Yellow Time (s)	5.0	5.0			5.0	5.0	4.0	4.0				
All-Red Time (s)	0.0	0.0			0.0	0.0	1.0	1.0				
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0	0.0				
Total Lost Time (s)	5.0	5.0			5.0	5.0	5.0	5.0				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0			3.0	3.0	4.0	4.0				
Recall Mode	None	None			None	None	Max	Max				
Walk Time (s)	5.0	5.0			5.0	5.0	7.0	7.0				
Flash Dont Walk (s)	15.0	15.0			15.0	15.0	8.0	8.0				
Pedestrian Calls (#/hr)	0	0			0	0	0	0				
Act Effct Green (s)	31.5	31.5			31.5	31.5	21.6	21.6				
Actuated g/C Ratio	0.50	0.50			0.50	0.50	0.34	0.34				
v/c Ratio	0.14	0.67			0.67	0.19	0.16	0.34				
Control Delay	8.8	15.3			15.3	3.8	19.8	18.8				
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0				
Total Delay	8.8	15.3			15.3	3.8	19.8	18.8				
LOS	A	B			B	A	B	B				
Approach Delay		14.9			12.9			19.0				
Approach LOS		B			B			B				

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 63.5
Natural Cycle: 50
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.67
Intersection Signal Delay: 15.2 Intersection LOS: B
Intersection Capacity Utilization 47.7% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 246: Union & Monroe

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø2
Lane Configurations							
Volume (vph)	70	0	136	154	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0	0	200			0	
Storage Lanes	2	0	1			0	
Taper Length (ft)	25		25				
Lane Util. Factor	0.97	1.00	1.00	0.95	1.00	1.00	
Frt							
Flt Protected	0.950		0.950				
Satd. Flow (prot)	3367	0	1770	3539	0	0	
Flt Permitted	0.950		0.950				
Satd. Flow (perm)	3367	0	1770	3539	0	0	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)							
Link Speed (mph)	30			30	30		
Link Distance (ft)	136			556	451		
Travel Time (s)	3.1			12.6	10.3		
Peak Hour Factor	0.90	0.90	0.95	0.95	0.90	0.90	
Growth Factor	113%	113%	113%	113%	113%	113%	
Heavy Vehicles (%)	4%	2%	2%	2%	2%	2%	
Adj. Flow (vph)	88	0	162	183	0	0	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	88	0	162	183	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	24			12	12		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9	15			9	
Number of Detectors	1		1	1			
Detector Template							
Leading Detector (ft)	50		50	50			
Trailing Detector (ft)	0		0	0			
Detector 1 Position(ft)	0		0	0			
Detector 1 Size(ft)	50		50	50			
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex			
Detector 1 Channel							
Detector 1 Extend (s)	0.0		0.0	0.0			
Detector 1 Queue (s)	0.0		0.0	0.0			
Detector 1 Delay (s)	0.0		0.0	0.0			
Turn Type	Prot		Prot	NA			
Protected Phases	1		3	2 3			2
Permitted Phases							
Detector Phase	1		3	2 3			
Switch Phase							
Minimum Initial (s)	7.0		6.0				10.0
Minimum Split (s)	21.0		24.0				28.0

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø2
Total Split (s)	22.0		39.0				39.0
Total Split (%)	22.0%		39.0%				39%
Maximum Green (s)	16.0		34.0				34.0
Yellow Time (s)	4.0		4.0				4.0
All-Red Time (s)	2.0		1.0				1.0
Lost Time Adjust (s)	0.0		0.0				
Total Lost Time (s)	6.0		5.0				
Lead/Lag	Lead						Lag
Lead-Lag Optimize?							
Vehicle Extension (s)	2.0		4.0				3.0
Recall Mode	C-Max		None				None
Walk Time (s)	7.0						7.0
Flash Dont Walk (s)	8.0						15.0
Pedestrian Calls (#/hr)	0						0
Act Effct Green (s)	55.7		16.3	33.3			
Actuated g/C Ratio	0.56		0.16	0.33			
v/c Ratio	0.05		0.56	0.16			
Control Delay	1.4		45.2	22.3			
Queue Delay	0.4		0.0	0.0			
Total Delay	1.7		45.2	22.3			
LOS	A		D	C			
Approach Delay	1.7			33.0			
Approach LOS	A			C			

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 54 (54%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 26.7	Intersection LOS: C
Intersection Capacity Utilization 23.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2592: Union & Broad

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø2
Lane Configurations							
Volume (vph)	250	0	56	170	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0	0	200			0	
Storage Lanes	2	0	1			0	
Taper Length (ft)	25		25				
Lane Util. Factor	0.97	1.00	1.00	0.95	1.00	1.00	
Frt							
Flt Protected	0.950		0.950				
Satd. Flow (prot)	3433	0	1787	3574	0	0	
Flt Permitted	0.950		0.950				
Satd. Flow (perm)	3433	0	1787	3574	0	0	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)							
Link Speed (mph)	30			30	30		
Link Distance (ft)	175			499	451		
Travel Time (s)	4.0			11.3	10.3		
Peak Hour Factor	0.88	0.88	0.86	0.86	0.90	0.90	
Growth Factor	113%	113%	113%	113%	113%	113%	
Heavy Vehicles (%)	2%	2%	1%	1%	2%	2%	
Adj. Flow (vph)	321	0	74	223	0	0	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	321	0	74	223	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	24			12	12		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9	15			9	
Number of Detectors	1		1	1			
Detector Template							
Leading Detector (ft)	50		50	50			
Trailing Detector (ft)	0		0	0			
Detector 1 Position(ft)	0		0	0			
Detector 1 Size(ft)	50		50	50			
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex			
Detector 1 Channel							
Detector 1 Extend (s)	0.0		0.0	0.0			
Detector 1 Queue (s)	0.0		0.0	0.0			
Detector 1 Delay (s)	0.0		0.0	0.0			
Turn Type	Prot		Prot	NA			
Protected Phases	1		3	2 3			2
Permitted Phases							
Detector Phase	1		3	2 3			
Switch Phase							
Minimum Initial (s)	7.0		6.0				10.0
Minimum Split (s)	21.0		24.0				28.0

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø2
Total Split (s)	31.0		24.0				45.0
Total Split (%)	31.0%		24.0%				45%
Maximum Green (s)	25.0		19.0				40.0
Yellow Time (s)	4.0		4.0				4.0
All-Red Time (s)	2.0		1.0				1.0
Lost Time Adjust (s)	0.0		0.0				
Total Lost Time (s)	6.0		5.0				
Lead/Lag	Lead						Lag
Lead-Lag Optimize?							
Vehicle Extension (s)	2.0		4.0				3.0
Recall Mode	C-Max		None				None
Walk Time (s)	7.0						7.0
Flash Dont Walk (s)	8.0						15.0
Pedestrian Calls (#/hr)	0						0
Act Effct Green (s)	60.7		11.0	28.3			
Actuated g/C Ratio	0.61		0.11	0.28			
v/c Ratio	0.15		0.38	0.22			
Control Delay	3.4		45.7	26.8			
Queue Delay	0.4		0.0	0.0			
Total Delay	3.8		45.7	26.8			
LOS	A		D	C			
Approach Delay	3.8			31.5			
Approach LOS	A			C			

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 25 (25%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay: 17.1	Intersection LOS: B
Intersection Capacity Utilization 25.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2592: Union & Broad

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	67	31	23	115	0	0	0	0	3	156	177
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.91	0.91	0.91
Frt			0.850								0.921	
Flt Protected					0.992							
Satd. Flow (prot)	0	3471	1553	0	3511	0	0	0	0	0	4684	0
Flt Permitted					0.913							
Satd. Flow (perm)	0	3471	1553	0	3231	0	0	0	0	0	4684	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			76								244	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		786			136			477			435	
Travel Time (s)		17.9			3.1			10.8			9.9	
Peak Hour Factor	0.78	0.78	0.78	0.85	0.85	0.85	0.90	0.90	0.90	0.82	0.82	0.82
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	97	45	31	153	0	0	0	0	4	215	244
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	97	45	0	184	0	0	0	0	0	463	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		1	1	1	1					1	1	
Detector Template												
Leading Detector (ft)		50	50	50	50					50	50	
Trailing Detector (ft)		0	0	0	0					0	0	
Detector 1 Position(ft)		0	0	0	0					0	0	
Detector 1 Size(ft)		50	50	50	50					50	50	
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Turn Type		NA	Perm	D.P+P	NA					Split	NA	
Protected Phases		1		3	1 3					2	2	
Permitted Phases			1	1								
Detector Phase		1	1	3	1 3					2	2	
Switch Phase												
Minimum Initial (s)		7.0	7.0	6.0						10.0	10.0	
Minimum Split (s)		21.0	21.0	24.0						28.0	28.0	
Total Split (s)		22.0	22.0	39.0						39.0	39.0	
Total Split (%)		22.0%	22.0%	39.0%						39.0%	39.0%	
Maximum Green (s)		16.0	16.0	34.0						34.0	34.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)		4.0	4.0	4.0						4.0	4.0	
All-Red Time (s)		2.0	2.0	1.0						1.0	1.0	
Lost Time Adjust (s)		0.0	0.0								0.0	
Total Lost Time (s)		6.0	6.0								5.0	
Lead/Lag		Lead	Lead							Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0	4.0						3.0	3.0	
Recall Mode		C-Max	C-Max	None						None	None	
Walk Time (s)		7.0	7.0							7.0	7.0	
Flash Dont Walk (s)		8.0	8.0							15.0	15.0	
Pedestrian Calls (#/hr)		0	0							0	0	
Act Effct Green (s)		55.7	55.7		71.0						12.0	
Actuated g/C Ratio		0.56	0.56		0.71						0.12	
v/c Ratio		0.05	0.05		0.08						0.60	
Control Delay		7.0	3.4		0.6						10.6	
Queue Delay		0.0	0.0		0.2						0.0	
Total Delay		7.0	3.4		0.8						10.6	
LOS		A	A		A						B	
Approach Delay		5.9			0.8						10.6	
Approach LOS		A			A						B	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 54 (54%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 7.4	Intersection LOS: A
Intersection Capacity Utilization 34.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2591: Pitkin & Broad

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	235	139	44	29	0	0	0	0	15	196	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.91	0.91	0.91
Frt			0.850								0.970	
Flt Protected					0.971						0.997	
Satd. Flow (prot)	0	3539	1583	0	3437	0	0	0	0	0	4918	0
Flt Permitted					0.715						0.997	
Satd. Flow (perm)	0	3539	1583	0	2531	0	0	0	0	0	4918	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			209								71	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		750			175			248			439	
Travel Time (s)		17.0			4.0			5.6			10.0	
Peak Hour Factor	0.75	0.75	0.75	0.77	0.77	0.77	0.90	0.90	0.90	0.82	0.82	0.82
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Adj. Flow (vph)	0	354	209	65	43	0	0	0	0	21	270	72
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	354	209	0	108	0	0	0	0	0	363	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		1	1	1	1					1	1	
Detector Template												
Leading Detector (ft)		50	50	50	50					50	50	
Trailing Detector (ft)		0	0	0	0					0	0	
Detector 1 Position(ft)		0	0	0	0					0	0	
Detector 1 Size(ft)		50	50	50	50					50	50	
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Turn Type		NA	Perm	D.P+P	NA					Split	NA	
Protected Phases		1		3	1 3					2	2	
Permitted Phases			1	1								
Detector Phase		1	1	3	1 3					2	2	
Switch Phase												
Minimum Initial (s)		7.0	7.0	6.0						10.0	10.0	
Minimum Split (s)		21.0	21.0	24.0						28.0	28.0	
Total Split (s)		31.0	31.0	24.0						45.0	45.0	
Total Split (%)		31.0%	31.0%	24.0%						45.0%	45.0%	
Maximum Green (s)		25.0	25.0	19.0						40.0	40.0	
Yellow Time (s)		4.0	4.0	4.0						4.0	4.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)		2.0	2.0	1.0						1.0	1.0	
Lost Time Adjust (s)		0.0	0.0								0.0	
Total Lost Time (s)		6.0	6.0								5.0	
Lead/Lag		Lead	Lead							Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0	4.0						3.0	3.0	
Recall Mode		C-Max	C-Max	None						None	None	
Walk Time (s)		7.0	7.0							7.0	7.0	
Flash Dont Walk (s)		8.0	8.0							15.0	15.0	
Pedestrian Calls (#/hr)		0	0							0	0	
Act Effct Green (s)		60.7	60.7		70.7						12.3	
Actuated g/C Ratio		0.61	0.61		0.71						0.12	
v/c Ratio		0.16	0.20		0.06						0.55	
Control Delay		6.4	0.6		1.2						31.5	
Queue Delay		0.0	0.0		0.1						0.0	
Total Delay		6.4	0.6		1.3						31.5	
LOS		A	A		A						C	
Approach Delay		4.3			1.3						31.5	
Approach LOS		A			A						C	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 25 (25%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay: 13.5	Intersection LOS: B
Intersection Capacity Utilization 38.1%	ICU Level of Service A
Analysis Period (min) 15	

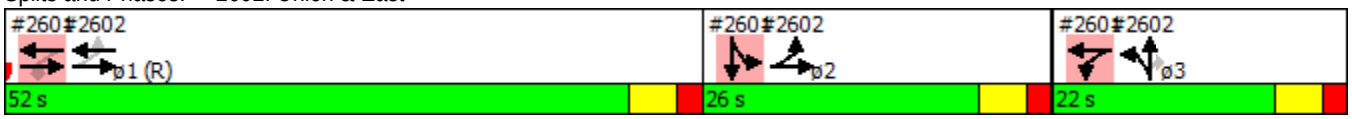
Splits and Phases: 2591: Pitkin & Broad

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	332	0	0	450	67	68	84	65	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Frt					0.981				0.850			
Flt Protected		0.997						0.978				
Satd. Flow (prot)	0	3461	0	0	3405	0	0	3362	1538	0	0	0
Flt Permitted		0.897						0.978				
Satd. Flow (perm)	0	3114	0	0	3405	0	0	3362	1538	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					22				87			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		123			667			451			780	
Travel Time (s)		2.8			15.2			10.3			17.7	
Peak Hour Factor	0.76	0.76	0.76	0.93	0.93	0.93	0.94	0.94	0.94	0.90	0.90	0.90
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	5%	5%	5%	2%	2%	2%
Adj. Flow (vph)	36	494	0	0	547	81	82	101	78	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	530	0	0	628	0	0	183	78	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1			1		1	1	1			
Detector Template												
Leading Detector (ft)	50	50			50		50	50	50			
Trailing Detector (ft)	0	0			0		0	0	0			
Detector 1 Position(ft)	0	0			0		0	0	0			
Detector 1 Size(ft)	50	50			50		50	50	50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Turn Type	pm+pt	NA			NA		Split	NA	Perm			
Protected Phases	2	1 2			1		3	3				
Permitted Phases	1 2								3			
Detector Phase	2	1 2			1		3	3	3			
Switch Phase												
Minimum Initial (s)	6.0				6.0		6.0	6.0	6.0			
Minimum Split (s)	23.0				23.0		22.0	22.0	22.0			
Total Split (s)	26.0				52.0		22.0	22.0	22.0			
Total Split (%)	26.0%				52.0%		22.0%	22.0%	22.0%			
Maximum Green (s)	20.5				46.5		16.5	16.5	16.5			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	3.5				3.5		3.5	3.5	3.5			
All-Red Time (s)	2.0				2.0		2.0	2.0	2.0			
Lost Time Adjust (s)					0.0			0.0	0.0			
Total Lost Time (s)					5.5			5.5	5.5			
Lead/Lag	Lag				Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				2.0		3.0	3.0	3.0			
Recall Mode	None				C-Max		None	None	None			
Walk Time (s)	7.0				7.0		7.0	7.0	7.0			
Flash Dont Walk (s)	9.0				10.0		9.0	9.0	9.0			
Pedestrian Calls (#/hr)	0				0		0	0	0			
Act Effct Green (s)		70.4			51.8			13.1	13.1			
Actuated g/C Ratio		0.70			0.52			0.13	0.13			
v/c Ratio		0.23			0.35			0.42	0.28			
Control Delay		1.5			6.9			33.8	9.6			
Queue Delay		0.5			0.0			0.0	0.0			
Total Delay		2.0			6.9			33.8	9.6			
LOS		A			A			C	A			
Approach Delay		2.0			6.9			26.6				
Approach LOS		A			A			C				

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 16 (16%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 8.7	Intersection LOS: A
Intersection Capacity Utilization 45.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2602: Union & East



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	609	0	0	347	57	43	166	211	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Frt					0.979				0.850			
Flt Protected		0.997						0.990				
Satd. Flow (prot)	0	3529	0	0	3431	0	0	3504	1583	0	0	0
Flt Permitted		0.907						0.990				
Satd. Flow (perm)	0	3210	0	0	3431	0	0	3504	1583	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					19				191			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		148			667			451			567	
Travel Time (s)		3.4			15.2			10.3			12.9	
Peak Hour Factor	0.86	0.86	0.86	0.87	0.87	0.87	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	47	800	0	0	451	74	54	208	265	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	847	0	0	525	0	0	262	265	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1			1		1	1	1			
Detector Template												
Leading Detector (ft)	50	50			50		50	50	50			
Trailing Detector (ft)	0	0			0		0	0	0			
Detector 1 Position(ft)	0	0			0		0	0	0			
Detector 1 Size(ft)	50	50			50		50	50	50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Turn Type	pm+pt	NA			NA		Split	NA	Perm			
Protected Phases	2	1 2			1		3	3				
Permitted Phases	1 2								3			
Detector Phase	2	1 2			1		3	3	3			
Switch Phase												
Minimum Initial (s)	6.0				6.0		6.0	6.0	6.0			
Minimum Split (s)	23.0				23.0		22.0	22.0	22.0			
Total Split (s)	36.0				35.0		29.0	29.0	29.0			
Total Split (%)	36.0%				35.0%		29.0%	29.0%	29.0%			
Maximum Green (s)	30.5				29.5		23.5	23.5	23.5			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	3.5				3.5		3.5	3.5	3.5			
All-Red Time (s)	2.0				2.0		2.0	2.0	2.0			
Lost Time Adjust (s)					0.0			0.0	0.0			
Total Lost Time (s)					5.5			5.5	5.5			
Lead/Lag	Lag				Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				2.0		3.0	3.0	3.0			
Recall Mode	None				C-Max		None	None	None			
Walk Time (s)	7.0				7.0		7.0	7.0	7.0			
Flash Dont Walk (s)	9.0				10.0		9.0	9.0	9.0			
Pedestrian Calls (#/hr)	0				0		0	0	0			
Act Effct Green (s)		68.0			45.4			15.5	15.5			
Actuated g/C Ratio		0.68			0.45			0.16	0.16			
v/c Ratio		0.38			0.34			0.48	0.65			
Control Delay		1.4			29.1			36.6	19.1			
Queue Delay		0.1			0.0			0.0	0.0			
Total Delay		1.5			29.1			36.6	19.1			
LOS		A			C			D	B			
Approach Delay		1.5			29.1			27.8				
Approach LOS		A			C			C				

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 94 (94%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 16.4 Intersection LOS: B
Intersection Capacity Utilization 53.4% ICU Level of Service A
Analysis Period (min) 15

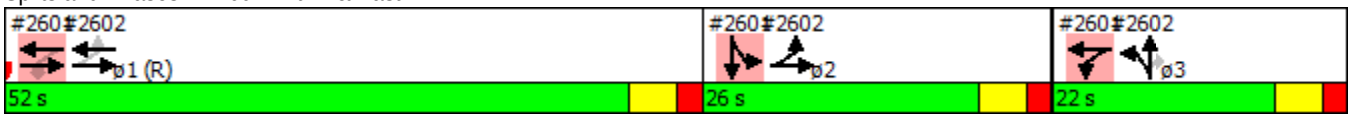
Splits and Phases: 2602: Union & East

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	189	30	138	353	0	0	0	0	171	168	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		125	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt			0.850								0.978	
Flt Protected					0.986					0.950		
Satd. Flow (prot)	0	3471	1553	0	3423	0	0	0	0	1736	3395	0
Flt Permitted					0.779					0.950		
Satd. Flow (perm)	0	3471	1553	0	2704	0	0	0	0	1736	3395	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			87								18	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		788			123			435			516	
Travel Time (s)		17.9			2.8			9.9			11.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.90	0.90	0.90	0.80	0.80	0.80
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	2%	2%	2%	4%	4%	4%
Adj. Flow (vph)	0	225	36	164	420	0	0	0	0	242	237	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	225	36	0	584	0	0	0	0	242	278	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		1	1	1	1					1	1	
Detector Template												
Leading Detector (ft)		50	50	50	50					50	50	
Trailing Detector (ft)		0	0	0	0					0	0	
Detector 1 Position(ft)		0	0	0	0					0	0	
Detector 1 Size(ft)		50	50	50	50					50	50	
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Turn Type		NA	Perm	pm+pt	NA					Split	NA	
Protected Phases		1		3	1 3					2	2	
Permitted Phases			1	1 3								
Detector Phase		1	1	3	1 3					2	2	
Switch Phase												
Minimum Initial (s)		6.0	6.0	6.0						6.0	6.0	
Minimum Split (s)		23.0	23.0	22.0						23.0	23.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)		52.0	52.0	22.0						26.0	26.0	
Total Split (%)		52.0%	52.0%	22.0%						26.0%	26.0%	
Maximum Green (s)		46.5	46.5	16.5						20.5	20.5	
Yellow Time (s)		3.5	3.5	3.5						3.5	3.5	
All-Red Time (s)		2.0	2.0	2.0						2.0	2.0	
Lost Time Adjust (s)		0.0	0.0							0.0	0.0	
Total Lost Time (s)		5.5	5.5							5.5	5.5	
Lead/Lag		Lead	Lead							Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0	3.0						3.0	3.0	
Recall Mode		C-Max	C-Max	None						None	None	
Walk Time (s)		7.0	7.0	7.0						7.0	7.0	
Flash Dont Walk (s)		10.0	10.0	9.0						9.0	9.0	
Pedestrian Calls (#/hr)		0	0	0						0	0	
Act Effct Green (s)		51.8	51.8		64.9					18.6	18.6	
Actuated g/C Ratio		0.52	0.52		0.65					0.19	0.19	
v/c Ratio		0.13	0.04		0.32					0.75	0.43	
Control Delay		13.4	2.2		1.2					52.5	34.6	
Queue Delay		0.0	0.0		0.2					0.0	0.0	
Total Delay		13.4	2.2		1.4					52.5	34.6	
LOS		B	A		A					D	C	
Approach Delay		11.8			1.4						42.9	
Approach LOS		B			A						D	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 16 (16%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 19.2	Intersection LOS: B
Intersection Capacity Utilization 45.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2601: Pitkin & East



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	445	51	78	316	0	0	0	0	197	114	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		125	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt			0.850								0.972	
Flt Protected					0.990					0.950		
Satd. Flow (prot)	0	3539	1583	0	3470	0	0	0	0	1770	3440	0
Flt Permitted					0.755					0.950		
Satd. Flow (perm)	0	3539	1583	0	2646	0	0	0	0	1770	3440	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			87								29	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		763			148			439			686	
Travel Time (s)		17.3			3.4			10.0			15.6	
Peak Hour Factor	0.92	0.92	0.92	0.93	0.93	0.93	0.90	0.90	0.90	0.89	0.89	0.89
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	547	63	95	384	0	0	0	0	250	145	34
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	547	63	0	479	0	0	0	0	250	179	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		1	1	1	1					1	1	
Detector Template												
Leading Detector (ft)		50	50	50	50					50	50	
Trailing Detector (ft)		0	0	0	0					0	0	
Detector 1 Position(ft)		0	0	0	0					0	0	
Detector 1 Size(ft)		50	50	50	50					50	50	
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Turn Type		NA	Perm	pm+pt	NA					Split	NA	
Protected Phases		1		3	1 3					2	2	
Permitted Phases			1	1 3								
Detector Phase		1	1	3	1 3					2	2	
Switch Phase												
Minimum Initial (s)		6.0	6.0	6.0						6.0	6.0	
Minimum Split (s)		23.0	23.0	22.0						23.0	23.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)		35.0	35.0	29.0						36.0	36.0	
Total Split (%)		35.0%	35.0%	29.0%						36.0%	36.0%	
Maximum Green (s)		29.5	29.5	23.5						30.5	30.5	
Yellow Time (s)		3.5	3.5	3.5						3.5	3.5	
All-Red Time (s)		2.0	2.0	2.0						2.0	2.0	
Lost Time Adjust (s)		0.0	0.0							0.0	0.0	
Total Lost Time (s)		5.5	5.5							5.5	5.5	
Lead/Lag		Lead	Lead							Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0	3.0						3.0	3.0	
Recall Mode		C-Max	C-Max	None						None	None	
Walk Time (s)		7.0	7.0	7.0						7.0	7.0	
Flash Dont Walk (s)		10.0	10.0	9.0						9.0	9.0	
Pedestrian Calls (#/hr)		0	0	0						0	0	
Act Effct Green (s)		45.4	45.4		60.9					22.6	22.6	
Actuated g/C Ratio		0.45	0.45		0.61					0.23	0.23	
v/c Ratio		0.34	0.08		0.28					0.62	0.22	
Control Delay		15.4	1.2		5.8					43.8	27.8	
Queue Delay		0.0	0.0		0.1					0.0	0.0	
Total Delay		15.4	1.2		5.9					43.8	27.8	
LOS		B	A		A					D	C	
Approach Delay		13.9			5.9						37.1	
Approach LOS		B			A						D	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 94 (94%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 18.0	Intersection LOS: B
Intersection Capacity Utilization 52.4%	ICU Level of Service A
Analysis Period (min) 15	

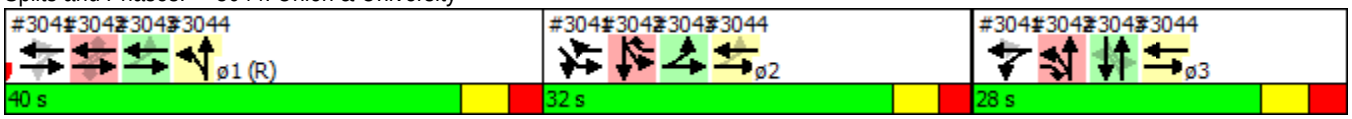
Splits and Phases: 2601: Pitkin & East

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	353	0	0	470	37	118	152	60	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00
Frt					0.989			0.958				
Flt Protected		0.999					0.950					
Satd. Flow (prot)	0	3468	0	0	3368	0	1703	3263	0	0	0	0
Flt Permitted		0.935					0.950					
Satd. Flow (perm)	0	3246	0	0	3368	0	1703	3263	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					12			63				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		316			584			383			361	
Travel Time (s)		7.2			13.3			8.7			8.2	
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.92	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Heavy Vehicles (%)	4%	4%	4%	6%	6%	6%	6%	6%	6%	2%	2%	2%
Adj. Flow (vph)	12	453	0	0	577	45	148	191	75	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	465	0	0	622	0	148	266	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1			1		1	1				
Detector Template												
Leading Detector (ft)	50	50			50		50	50				
Trailing Detector (ft)	0	0			0		0	0				
Detector 1 Position(ft)	0	0			0		0	0				
Detector 1 Size(ft)	50	50			50		50	50				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0				
Turn Type	custom	NA			NA		Split	NA				
Protected Phases		2 3			2 3		1	1				
Permitted Phases	2				2 3							
Detector Phase	2	2 3			2 3		1	1				
Switch Phase												
Minimum Initial (s)	6.0						7.0	7.0				
Minimum Split (s)	15.0						30.0	30.0				
Total Split (s)	32.0						40.0	40.0				
Total Split (%)	32.0%						40.0%	40.0%				
Maximum Green (s)	26.0						34.0	34.0				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	3.5						3.5	3.5				
All-Red Time (s)	2.5						2.5	2.5				
Lost Time Adjust (s)							0.0	0.0				
Total Lost Time (s)							6.0	6.0				
Lead/Lag	Lag						Lead	Lead				
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0						3.0	3.0				
Recall Mode	None						C-Max	C-Max				
Walk Time (s)							7.0	7.0				
Flash Dont Walk (s)							16.0	16.0				
Pedestrian Calls (#/hr)							0	0				
Act Effct Green (s)		54.0			54.0		34.0	34.0				
Actuated g/C Ratio		0.54			0.54		0.34	0.34				
v/c Ratio		0.27			0.34		0.26	0.23				
Control Delay		4.6			3.6		20.3	13.5				
Queue Delay		0.5			0.0		0.0	0.0				
Total Delay		5.1			3.7		20.3	13.5				
LOS		A			A		C	B				
Approach Delay		5.1			3.7			15.9				
Approach LOS		A			A			B				

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 38 (38%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 7.5	Intersection LOS: A
Intersection Capacity Utilization 35.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3044: Union & University

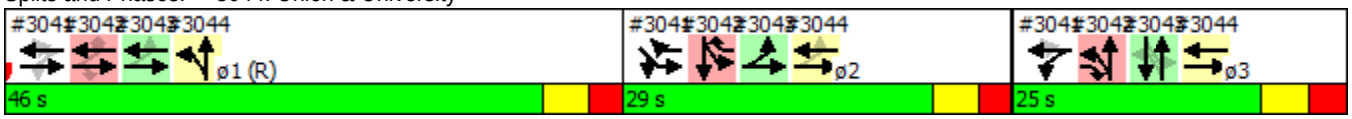


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	526	0	0	424	30	208	237	116	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00
Frt					0.990			0.951				
Flt Protected		0.999					0.950					
Satd. Flow (prot)	0	3536	0	0	3539	0	1787	3399	0	0	0	0
Flt Permitted		0.946					0.950					
Satd. Flow (perm)	0	3348	0	0	3539	0	1787	3399	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					10			99				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		298			584			576			361	
Travel Time (s)		6.8			13.3			13.1			8.2	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.86	0.86	0.86	0.90	0.90	0.90
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Adj. Flow (vph)	9	762	0	0	614	43	273	311	152	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	771	0	0	657	0	273	463	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1			1		1	1				
Detector Template												
Leading Detector (ft)	50	50			50		50	50				
Trailing Detector (ft)	0	0			0		0	0				
Detector 1 Position(ft)	0	0			0		0	0				
Detector 1 Size(ft)	50	50			50		50	50				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0				
Turn Type	custom	NA			NA		Split	NA				
Protected Phases		2 3			2 3		1	1				
Permitted Phases	2				2 3							
Detector Phase	2	2 3			2 3		1	1				
Switch Phase												
Minimum Initial (s)	6.0						7.0	7.0				
Minimum Split (s)	15.0						30.0	30.0				
Total Split (s)	29.0						46.0	46.0				
Total Split (%)	29.0%						46.0%	46.0%				
Maximum Green (s)	23.0						40.0	40.0				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	3.5						3.5	3.5				
All-Red Time (s)	2.5						2.5	2.5				
Lost Time Adjust (s)							0.0	0.0				
Total Lost Time (s)							6.0	6.0				
Lead/Lag	Lag						Lead	Lead				
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0						3.0	3.0				
Recall Mode	None						C-Max	C-Max				
Walk Time (s)							7.0	7.0				
Flash Dont Walk (s)							16.0	16.0				
Pedestrian Calls (#/hr)							0	0				
Act Effct Green (s)		48.0			48.0		40.0	40.0				
Actuated g/C Ratio		0.48			0.48		0.40	0.40				
v/c Ratio		0.48			0.39		0.38	0.33				
Control Delay		9.1			11.1		28.5	21.4				
Queue Delay		1.9			0.1		0.0	0.0				
Total Delay		11.0			11.2		28.5	21.4				
LOS		B			B		C	C				
Approach Delay		11.0			11.2			24.1				
Approach LOS		B			B			C				

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 51 (51%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 15.5	Intersection LOS: B
Intersection Capacity Utilization 44.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3044: Union & University

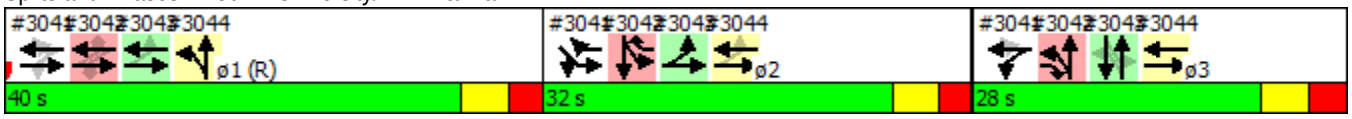


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	292	148	1	680	445	239	369	3	425	341	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	0		0	0		0	250		250
Storage Lanes	1		1	0		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	0.95	0.95	1.00	0.91	0.91	0.95	0.91	0.91	0.95
Frt		0.992	0.850			0.850		0.999			0.997	
Flt Protected	0.950						0.950	0.995		0.950	0.984	
Satd. Flow (prot)	1597	3036	1301	0	3312	1482	1579	3305	0	1507	3112	0
Flt Permitted	0.175				0.955		0.950	0.995		0.950	0.984	
Satd. Flow (perm)	294	3036	1301	0	3163	1482	1579	3305	0	1507	3112	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6	130			43		1			2	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		297			291			316			393	
Travel Time (s)		6.8			6.6			7.2			8.9	
Peak Hour Factor	0.87	0.87	0.87	0.90	0.90	0.90	0.81	0.81	0.81	0.92	0.92	0.92
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Heavy Vehicles (%)	13%	13%	13%	9%	9%	9%	4%	4%	4%	9%	9%	9%
Adj. Flow (vph)	12	379	192	1	854	559	333	515	4	522	419	12
Shared Lane Traffic (%)			11%				17%			40%		
Lane Group Flow (vph)	12	400	171	0	855	559	276	576	0	313	640	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50	50	50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	50	50	50	50	50	50	50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Split	NA		Split	NA	
Protected Phases		1	3		1	2	3	3		2	2	
Permitted Phases	1		1	1		1						
Detector Phase	1	1	3	1	1	2	3	3		2	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	6.0	7.0	7.0	6.0	6.0	6.0		6.0	6.0	
Minimum Split (s)	30.0	30.0	15.0	30.0	30.0	15.0	15.0	15.0		15.0	15.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	40.0	40.0	28.0	40.0	40.0	32.0	28.0	28.0		32.0	32.0	
Total Split (%)	40.0%	40.0%	28.0%	40.0%	40.0%	32.0%	28.0%	28.0%		32.0%	32.0%	
Maximum Green (s)	34.0	34.0	21.5	34.0	34.0	26.0	21.5	21.5		26.0	26.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	2.5	2.5	3.0	2.5	2.5	2.5	3.0	3.0		2.5	2.5	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.5		6.0	6.0	6.5	6.5		6.0	6.0	
Lead/Lag	Lead	Lead		Lead	Lead	Lag				Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	None	C-Max	C-Max	None	None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0							
Flash Dont Walk (s)	16.0	16.0		16.0	16.0							
Pedestrian Calls (#/hr)	0	0		0	0							
Act Effct Green (s)	34.0	34.0	61.5		34.0	66.0	21.5	21.5		26.0	26.0	
Actuated g/C Ratio	0.34	0.34	0.62		0.34	0.66	0.22	0.22		0.26	0.26	
v/c Ratio	0.12	0.39	0.20		0.80	0.56	0.81	0.81		0.80	0.79	
Control Delay	25.8	23.5	6.3		11.7	5.8	52.1	42.1		51.6	42.6	
Queue Delay	0.0	0.4	0.4		0.3	5.7	0.8	1.1		0.0	0.0	
Total Delay	25.8	23.8	6.7		12.0	11.5	52.9	43.2		51.6	42.6	
LOS	C	C	A		B	B	D	D		D	D	
Approach Delay		18.9			11.8			46.3			45.5	
Approach LOS		B			B			D			D	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 38 (38%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 29.1	Intersection LOS: C
Intersection Capacity Utilization 70.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3042: University/IL WB & Main

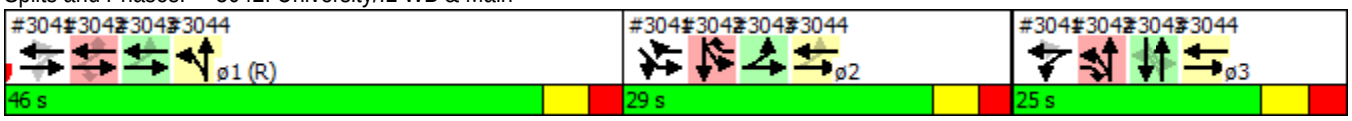


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	18	530	215	0	525	430	230	418	1	398	316	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	0		0	0		0	250		250
Storage Lanes	1		1	0		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	0.91	0.91	0.95	0.91	0.91	0.95
Frt		0.994	0.850			0.850					0.998	
Flt Protected	0.950						0.950	0.997		0.950	0.983	
Satd. Flow (prot)	1736	3305	1413	0	3438	1538	1610	3380	0	1595	3294	0
Flt Permitted	0.330						0.950	0.997		0.950	0.983	
Satd. Flow (perm)	603	3305	1413	0	3438	1538	1610	3380	0	1595	3294	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5	97			38					1	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		298			291			298			403	
Travel Time (s)		6.8			6.6			6.8			9.2	
Peak Hour Factor	0.83	0.83	0.83	0.93	0.93	0.93	0.84	0.84	0.84	0.85	0.85	0.85
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	2%	2%	2%	3%	3%	3%
Adj. Flow (vph)	25	722	293	0	638	522	309	562	1	529	420	7
Shared Lane Traffic (%)			10%				10%			41%		
Lane Group Flow (vph)	25	751	264	0	638	522	278	594	0	312	644	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1		1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50		50	50	50	50		50	50	
Trailing Detector (ft)	0	0	0		0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0		0	0	0	0		0	0	
Detector 1 Size(ft)	50	50	50		50	50	50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	Perm	NA	pm+ov		NA	pm+ov	Split	NA		Split	NA	
Protected Phases		1	3		1	2	3	3		2	2	
Permitted Phases	1		1			1						
Detector Phase	1	1	3		1	2	3	3		2	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	6.0		7.0	6.0	6.0	6.0		6.0	6.0	
Minimum Split (s)	30.0	30.0	15.0		30.0	15.0	15.0	15.0		15.0	15.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	46.0	46.0	25.0		46.0	29.0	25.0	25.0		29.0	29.0	
Total Split (%)	46.0%	46.0%	25.0%		46.0%	29.0%	25.0%	25.0%		29.0%	29.0%	
Maximum Green (s)	40.0	40.0	18.5		40.0	23.0	18.5	18.5		23.0	23.0	
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	2.5	2.5	3.0		2.5	2.5	3.0	3.0		2.5	2.5	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.5		6.0	6.0	6.5	6.5		6.0	6.0	
Lead/Lag	Lead	Lead			Lead	Lag				Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	None		C-Max	None	None	None		None	None	
Walk Time (s)	7.0	7.0			7.0							
Flash Dont Walk (s)	16.0	16.0			16.0							
Pedestrian Calls (#/hr)	0	0			0							
Act Effct Green (s)	40.0	40.0	64.5		40.0	69.0	18.5	18.5		23.0	23.0	
Actuated g/C Ratio	0.40	0.40	0.64		0.40	0.69	0.18	0.18		0.23	0.23	
v/c Ratio	0.10	0.57	0.28		0.46	0.49	0.94	0.95		0.85	0.85	
Control Delay	14.0	15.2	4.9		8.4	1.2	72.2	59.4		59.7	48.9	
Queue Delay	0.0	0.4	0.5		0.8	2.1	2.0	6.8		0.0	0.0	
Total Delay	14.0	15.7	5.3		9.2	3.3	74.3	66.2		59.7	48.9	
LOS	B	B	A		A	A	E	E		E	D	
Approach Delay		13.0			6.5			68.8			52.4	
Approach LOS		B			A			E			D	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 51 (51%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 32.6	Intersection LOS: C
Intersection Capacity Utilization 65.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3042: University/IL WB & Main

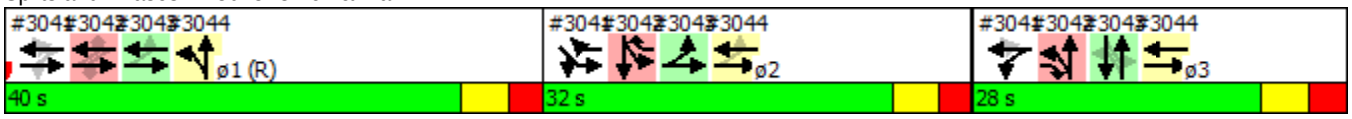


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	52	671	0	0	1034	24	4	88	105	29	0	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00
Frt					0.997			0.918			0.898	
Flt Protected	0.950						0.950				0.988	
Satd. Flow (prot)	1641	4715	0	0	4879	0	1597	2933	0	0	1492	0
Flt Permitted	0.118						0.625				0.855	
Satd. Flow (perm)	204	4715	0	0	4879	0	1051	2933	0	0	1291	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					4			130			113	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		291			715			361			297	
Travel Time (s)		6.6			16.3			8.2			6.8	
Peak Hour Factor	0.82	0.82	0.82	0.92	0.92	0.95	0.91	0.91	0.91	0.88	0.88	0.88
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Heavy Vehicles (%)	10%	10%	10%	6%	6%	6%	13%	13%	13%	13%	13%	13%
Adj. Flow (vph)	72	925	0	0	1270	29	5	109	130	37	0	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	72	925	0	0	1299	0	5	239	0	0	150	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1			1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50			50		50	50		50	50	
Trailing Detector (ft)	0	0			0		0	0		0	0	
Detector 1 Position(ft)	0	0			0		0	0		0	0	
Detector 1 Size(ft)	50	50			50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA			NA		Perm	NA		Perm	NA	
Protected Phases	2	1 2			1			3			3	
Permitted Phases	1 2						3			3		
Detector Phase	2	1 2			1		3	3		3	3	
Switch Phase												
Minimum Initial (s)	6.0				7.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	15.0				30.0		15.0	15.0		15.0	15.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	32.0				40.0		28.0	28.0		28.0	28.0	
Total Split (%)	32.0%				40.0%		28.0%	28.0%		28.0%	28.0%	
Maximum Green (s)	26.0				34.0		21.5	21.5		21.5	21.5	
Yellow Time (s)	3.5				3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.5				2.5		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0				0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0				6.0		6.5	6.5			6.5	
Lead/Lag	Lag				Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				3.0		3.0	3.0		3.0	3.0	
Recall Mode	None				C-Max		None	None		None	None	
Walk Time (s)					7.0							
Flash Dont Walk (s)					16.0							
Pedestrian Calls (#/hr)					0							
Act Effct Green (s)	60.0	66.0			34.0		21.5	21.5			21.5	
Actuated g/C Ratio	0.60	0.66			0.34		0.22	0.22			0.22	
v/c Ratio	0.15	0.30			0.78		0.02	0.33			0.41	
Control Delay	5.9	3.2			28.9		43.6	31.0			14.3	
Queue Delay	0.0	0.2			0.0		0.0	0.0			0.0	
Total Delay	5.9	3.5			28.9		43.6	31.0			14.3	
LOS	A	A			C		D	C			B	
Approach Delay		3.6			28.9			31.2			14.3	
Approach LOS		A			C			C			B	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 38 (38%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 19.0	Intersection LOS: B
Intersection Capacity Utilization 63.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3043: Union & Main

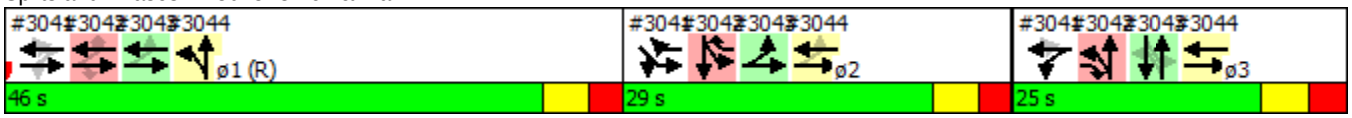


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	52	881	0	0	902	62	5	100	195	28	0	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	1.00	*0.60	0.91	1.00	0.95	0.95	1.00	1.00	1.00
Frt					0.990			0.901			0.915	
Flt Protected	0.950						0.950				0.982	
Satd. Flow (prot)	1752	5036	0	0	3256	0	1770	3189	0	0	1642	0
Flt Permitted	0.100						0.697				0.640	
Satd. Flow (perm)	184	5036	0	0	3256	0	1298	3189	0	0	1070	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					8			125			98	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		291			715			361			297	
Travel Time (s)		6.6			16.3			8.2			6.8	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.92	0.92	0.92	0.78	0.78	0.78
Growth Factor	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	4%	4%	4%
Adj. Flow (vph)	67	1131	0	0	1158	80	6	123	240	41	0	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	1131	0	0	1238	0	6	363	0	0	111	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1			1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50			50		50	50		50	50	
Trailing Detector (ft)	0	0			0		0	0		0	0	
Detector 1 Position(ft)	0	0			0		0	0		0	0	
Detector 1 Size(ft)	50	50			50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA			NA		Perm	NA		Perm	NA	
Protected Phases	2	1 2			1			3			3	
Permitted Phases	1 2						3			3		
Detector Phase	2	1 2			1		3	3		3	3	
Switch Phase												
Minimum Initial (s)	6.0				7.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	15.0				30.0		15.0	15.0		15.0	15.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	29.0				46.0		25.0	25.0		25.0	25.0	
Total Split (%)	29.0%				46.0%		25.0%	25.0%		25.0%	25.0%	
Maximum Green (s)	23.0				40.0		18.5	18.5		18.5	18.5	
Yellow Time (s)	3.5				3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.5				2.5		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0				0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0				6.0		6.5	6.5			6.5	
Lead/Lag	Lag				Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				3.0		3.0	3.0		3.0	3.0	
Recall Mode	None				C-Max		None	None		None	None	
Walk Time (s)					7.0							
Flash Dont Walk (s)					16.0							
Pedestrian Calls (#/hr)					0							
Act Effct Green (s)	63.0	69.0			40.0		18.5	18.5			18.5	
Actuated g/C Ratio	0.63	0.69			0.40		0.18	0.18			0.18	
v/c Ratio	0.14	0.33			0.95		0.03	0.53			0.40	
Control Delay	5.1	2.5			36.4		50.5	39.7			14.2	
Queue Delay	0.0	0.2			0.0		0.0	0.0			0.0	
Total Delay	5.1	2.7			36.4		50.5	39.7			14.2	
LOS	A	A			D		D	D			B	
Approach Delay		2.8			36.4			39.9			14.2	
Approach LOS		A			D			D			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 51 (51%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 22.2	Intersection LOS: C
Intersection Capacity Utilization 62.4%	ICU Level of Service B
Analysis Period (min) 15	
* User Entered Value	

Splits and Phases: 3043: Union & Main



Appendix G – Traffic Analysis
Contents

2035 Preferred Alternative

- **Preferred Alternative Traffic Volumes**
- **Preferred Alternative Level Of Service Summary**
- **Preferred Alternative Capacity Analysis Printouts**
- **Synchro Files (available upon request)**

EXHIBIT X
2035 PROPOSED CONDITION
INTERSECTION CAPACITY ANALYSIS RESULTS

		Recommended Operations					
		AM Peak Hour			PM Peak Hour		
Intersection	LANE GROUP	V/C Ratio	Delay	Level of Service	V/C Ratio	Delay	Level of Service
Howell Street & Chestnut Street/Monroe Avenue *Signalized*	EB-L	0.73	50.3	D	0.70	71.5	E
	EB-TR	0.60	19.2	B	0.53	25.1	C
	WB-TR	0.67	45.8	D	0.95	62.1	E
	NB-L	0.51	23.8	C	0.97	74.4	E
	NB-TR	0.63	24.7	C	0.41	18.6	B
	SB-L	0.27	35.2	D	0.11	24.6	C
	SB-T	0.59	39.6	D	0.92	54.5	D
	SB-R	0.20	0.3	A	0.85	6.6	A
	Intersection	-	28.1	C	-	33.9	C
Howell Street & Union Street *Signalized*	EB-LTR	0.54	17.6	B	0.76	28.1	C
	WB-LTR	0.02	10.2	B	0.02	13.8	B
	NB-LTR	0.79	21.5	C	0.50	17.6	B
	SB-LTR	0.66	6.3	A	0.93	22.7	C
	Intersection	-	15.2	B	-	22.6	C
Union Street & Monroe Avenue *Signalized*	EB-L	0.31	28.2	C	0.35	33.7	C
	EB-T	0.75	40.5	D	0.50	36.3	D
	WB-TR	0.06	6.2	A	0.12	9.0	A
	NB-L	0.67	30.3	C	0.86	39.9	D
	NB-T	0.02	5.3	A	0.02	15.5	B
	NB-R	0.43	6.7	A	0.54	19.5	B
	SB-LTR	0.63	13.7	B	0.64	13.1	B
	Intersection	-	18.9	B	-	21.2	C
Union Street & E Broad Street *Signalized*	EB-L	0.37	39.3	D	0.82	50.5	D
	EB-R	0.21	36.3	D	0.58	38.4	D
	NB-L	0.59	35.7	D	0.39	38.0	D
	NB-T	0.49	4.7	A	0.61	12.0	B
	SB-TR	0.91	27.8	C	0.82	20.4	C
	Intersection	-	19.7	B	-	24.5	C
Union Street & East Avenue *Signalized - 3 Lane Section*	EB-L	0.13	18.4	B	0.16	15.5	B
	EB-TR	0.56	34.8	C	0.99	65.2	E
	WB-L	0.51	25.2	C	0.50	23.6	C
	WB-TR	0.84	46.1	D	0.72	32.4	C
	NB-L	0.82	76.0	E	0.41	47.7	D
	NB-TR	0.59	22.2	C	0.95	43.2	D
	SB-L	0.58	19.2	B	0.93	60.7	E
	SB-TR	0.89	55.6	E	0.97	69.4	E
	Intersection	-	37.6	D	-	50.5	D
East Avenue & Pitkin Street *Unsignalized*	EB-T	0.15	0.0	A	0.39	0.0	A
	WB-T	0.32	0.0	A	0.29	0.0	A
	SB-LR	0.11	16.6	C	0.10	17.3	C
	Intersection	-	0.7	A	-	0.5	A
Charlotte Street	EB-LTR	0.15	17.6	C	0.24	20.9	C
	WB-LTR	0.20	17.0	C	0.32	20.8	C
	NB-LTR	0.20	0.6	A	0.28	0.8	A
	SB-LTR	0.02	0.4	A	0.03	0.7	A
	Intersection	-	1.6	A	-	2.4	A
Charlotte Street & Pitkin Street *Unsignalized*	EB-TR	0.03	0.0	A	0.04	0.0	A
	WB-LT	0.00	0.2	A	0.00	0.2	A
	SB-LTR	0.07	10.0	A	0.07	10.4	B
	Intersection	-	3.1	A	-	2.4	A
Union Street & Inner Loop/Richmond Street *Unsignalized*	EB-LR	0.66	18.6	C	0.74	23.3	C
	WB-R	0.03	10.2	B	0.04	11.7	B
	NB-L	0.28	9.0	A	0.35	9.0	A
	NB-T	0.18	0.0	A	0.32	0.0	A
	SB-TR	0.15	0.0	A	0.08	0.0	A
	Intersection	-	8.8	A	-	9.9	A
Union Street & University Avenue	EB-LTR	0.30	3.2	A	0.30	3.2	A
	WB-LTR	0.30	7.9	A	0.29	9.8	A

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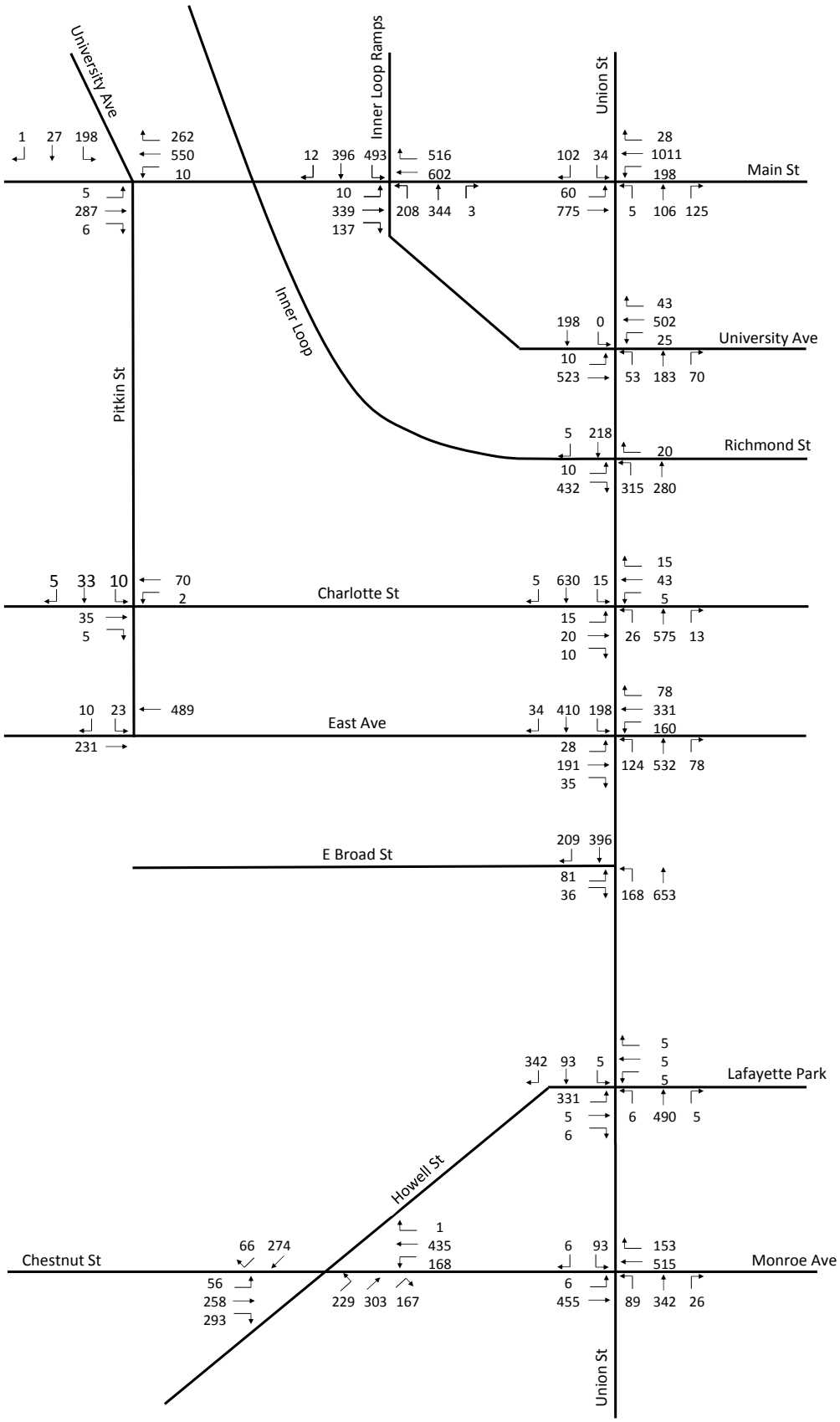
Signalized	**NB-LTR**	0.72	41.9	D	0.72	22.3	C
	SB-LTR	0.64	51.4	D	0.25	45.9	D
	Intersection	-	18.2	B	-	13.4	B
Union Street & Main Street *Signalized*	**EB-L**	0.13	2.3	A	0.01	1.0	A
	EB-TR	0.57	33.8	C	0.71	29.4	C
	WB-L	0.38	14.3	B	0.20	12.3	B
	WB-TR	0.76	33.0	C	0.72	31.3	C
	NB-LT	0.31	47.3	D	0.32	48.3	D
	NB-R	0.31	26.3	C	0.46	19.7	B
	SB-LTR	0.37	14.2	B	0.25	9.0	A
	Intersection	-	30.3	C	-	28.8	C
University Avenue/Inner Loop & Main Street *Signalized*	**EB-L**	0.17	29.3	C	0.31	27.5	C
	EB-TR	0.39	24.5	C	0.62	21.5	C
	EB-R	0.27	8.4	A	0.35	4.9	A
	WB-TR	0.92	8.3	A	0.70	3.8	A
	NB-L	0.58	36.4	D	0.49	45.7	D
	NB-LTR	0.56	32.1	C	0.48	42.5	D
	SB-L	0.73	41.4	D	0.70	40.6	D
	SB-LTR	0.72	35.9	D	0.70	36.0	D
	Intersection	-	23.5	C	-	22.6	C
University Avenue/Pitkin Street & Main Street *Signalized*	**EB-L**	0.09	26.8	C	0.27	36.3	D
	EB-TR	0.30	24.7	C	0.56	28.7	C
	WB-L	0.02	6.8	A	0.03	6.6	A
	WB-T	0.32	6.6	A	0.25	5.5	A
	WB-R	0.31	1.8	A	0.24	1.5	A
	SB-L	0.21	26.1	C	0.26	27.3	C
	SB-TR	0.06	23.2	C	0.06	22.6	C
	Intersection	-	12.9	B	-	17.4	B

v/c ratio = volume/capacity ratio
Source: Synchro 8/SimTraffic



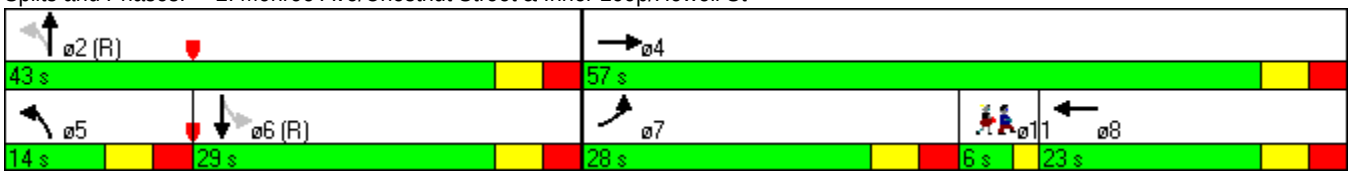
Stantec	61 Commercial Street Rochester, New York 14614 T: (585) 475-1440	**ROCHESTER INNER LOOP ALTERNATIVES ANALYSIS**	**EXHIBIT 3.6** **2035 Future BaseTraffic Volumes** **AM Peak Hour (7:30 AM - 8:30 AM)**

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	229	303	167	0	274	66	168	435	1	56	258	293
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	0		250	250		0	100		0
Storage Lanes	1		0	0		1	1		0	1		1
Taper Length (ft)	75			75			75			75		
Right Turn on Red			Yes			No			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		973			457			741			768	
Travel Time (s)		22.1			10.4			16.8			17.5	
Confl. Peds. (#/hr)	30		30	30		30	22		10	10		22
Confl. Bikes (#/hr)						20						
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
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	241	495	0	0	357	0	177	459	0	59	272	308
Turn Type	Prot	NA			NA		pm+pt	NA		Perm	NA	Free
Protected Phases	7	4			8		5	2			6	
Permitted Phases							2			6		Free
Detector Phase	7	4			8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	10.0			10.0		7.0	10.0		10.0	10.0	
Minimum Split (s)	13.5	22.5			22.5		13.5	23.5		23.5	23.5	
Total Split (s)	28.0	57.0			23.0		14.0	43.0		29.0	29.0	
Total Split (%)	28.0%	57.0%			23.0%		14.0%	43.0%		29.0%	29.0%	
Yellow Time (s)	3.5	3.5			3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.5	-1.5			-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead						Lead			Lag	Lag	
Lead-Lag Optimize?	Yes						Yes			Yes	Yes	
Recall Mode	None	Min			Min		None	C-Max		C-Max	C-Max	
Act Effct Green (s)	19.9	50.6			16.6		39.4	39.4		24.8	24.8	100.0
Actuated g/C Ratio	0.20	0.51			0.17		0.39	0.39		0.25	0.25	1.00
v/c Ratio	0.73	0.60			0.67		0.51	0.63		0.27	0.59	0.20
Control Delay	50.3	19.2			45.8		23.8	24.7		35.2	39.6	0.3
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	50.3	19.2			45.8		23.8	24.7		35.2	39.6	0.3
LOS	D	B			D		C	C		D	D	A
Approach Delay		29.4			45.8			24.4			20.2	
Approach LOS		C			D			C			C	
Queue Length 50th (ft)	143	190			112		51	134		31	155	0
Queue Length 95th (ft)	222	292			160		112	255		69	241	0
Internal Link Dist (ft)		893			377			661			688	
Turn Bay Length (ft)	200						250			100		
Base Capacity (vph)	384	851			574		347	733		215	462	1554
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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.63	0.58			0.62		0.51	0.63		0.27	0.59	0.20

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 28.1	Intersection LOS: C
Intersection Capacity Utilization 72.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: Monroe Ave/Chestnut Street & Inner Loop/Howell St



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø11
Lane Configurations							
Volume (vph)	81	36	168	653	396	209	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0	0	100			0	
Storage Lanes	1	1	1			0	
Taper Length (ft)	25		75				
Right Turn on Red		No				No	
Link Speed (mph)	30			30	30		
Link Distance (ft)	134			240	437		
Travel Time (s)	3.0			5.5	9.9		
Confl. Peds. (#/hr)		34	30			30	
Confl. Bikes (#/hr)						20	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	90	40	187	726	672	0	
Turn Type	NA	Perm	Prot	NA	NA		
Protected Phases	4		5	2	6		11
Permitted Phases		4					
Detector Phase	4	4	5	2	6		
Switch Phase							
Minimum Initial (s)	10.0	10.0	8.0	20.0	20.0		4.0
Minimum Split (s)	24.5	24.5	13.5	25.5	25.5		6.0
Total Split (s)	25.0	25.0	15.0	64.0	44.0		6.0
Total Split (%)	27.8%	27.8%	16.7%	71.1%	48.9%		7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		0.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5		
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		
Lead/Lag			Lead				Lag
Lead-Lag Optimize?			Yes				Yes
Recall Mode	None	None	None	C-Max	C-Max		Max
Act Effct Green (s)	12.6	12.6	16.5	73.3	40.0		
Actuated g/C Ratio	0.14	0.14	0.18	0.81	0.44		
v/c Ratio	0.37	0.21	0.59	0.49	0.91		
Control Delay	39.3	36.3	35.7	4.7	27.4		
Queue Delay	0.0	0.0	0.0	0.0	0.4		
Total Delay	39.3	36.3	35.7	4.7	27.8		
LOS	D	D	D	A	C		
Approach Delay	38.4			11.0	27.8		
Approach LOS	D			B	C		
Queue Length 50th (ft)	48	21	70	70	136		
Queue Length 95th (ft)	90	49	m153	272	m#478		
Internal Link Dist (ft)	54			160	357		
Turn Bay Length (ft)			100				
Base Capacity (vph)	405	326	318	1488	739		
Starvation Cap Reductn	0	0	0	0	5		
Spillback Cap Reductn	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø11
Reduced v/c Ratio	0.22	0.12	0.59	0.49	0.92		

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 88 (98%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 19.7 Intersection LOS: B
Intersection Capacity Utilization 67.2% 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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: S Union St & E Broad St

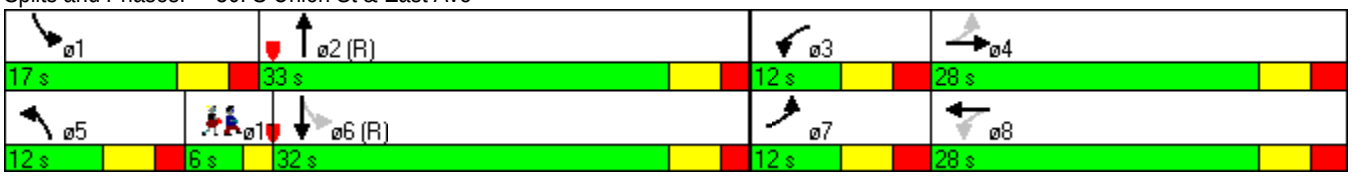
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	191	35	160	331	78	124	532	78	198	410	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	175		0	100		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	75			75			75			75		
Right Turn on Red			No			Yes			Yes			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		148			496			437			655	
Travel Time (s)		3.4			11.3			9.9			14.9	
Confl. Peds. (#/hr)	59		15	15		59	23		29	29		23
Confl. Bikes (#/hr)												20
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
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	5%	5%	5%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	31	251	0	178	455	0	138	678	0	220	494	0
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8						6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	20.0		6.0	20.0		6.0	20.0		6.0	20.0	
Minimum Split (s)	12.0	28.0		12.0	28.0		11.5	25.5		11.5	25.5	
Total Split (s)	12.0	28.0		12.0	28.0		12.0	33.0		17.0	32.0	
Total Split (%)	13.3%	31.1%		13.3%	31.1%		13.3%	36.7%		18.9%	35.6%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead					
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes					
Recall Mode	None	Min		None	Min		None	C-Max		None	C-Max	
Act Effct Green (s)	30.2	22.7		32.0	27.5		8.8	30.8		40.0	28.0	
Actuated g/C Ratio	0.34	0.25		0.36	0.31		0.10	0.34		0.44	0.31	
v/c Ratio	0.13	0.56		0.51	0.84		0.82	0.59		0.58	0.89	
Control Delay	18.4	34.8		25.2	46.1		76.0	22.2		19.2	49.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	5.8	
Total Delay	18.4	34.8		25.2	46.1		76.0	22.2		19.2	55.6	
LOS	B	C		C	D		E	C		B	E	
Approach Delay		33.0			40.2			31.3			44.4	
Approach LOS		C			D			C			D	
Queue Length 50th (ft)	11	123		67	250		69	166		66	265	
Queue Length 95th (ft)	28	199		115	#448		#187	247		110	#448	
Internal Link Dist (ft)		68			416			357			575	
Turn Bay Length (ft)				175			100			250		
Base Capacity (vph)	241	462		348	542		168	1151		397	556	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	36	
Storage Cap Reductn	0	0		0	0		0	0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.13	0.54		0.51	0.84		0.82	0.59		0.55	0.95	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green, Master Intersection
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 37.6 Intersection LOS: D
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: 30: S Union St & East Ave

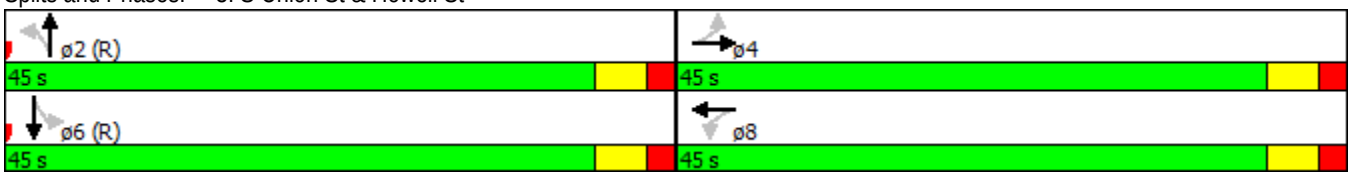


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	331	5	6	5	5	5	6	490	5	5	93	342
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	150		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			75		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			25			30			30	
Link Distance (ft)		339			304			503			434	
Travel Time (s)		7.7			8.3			11.4			9.9	
Confl. Peds. (#/hr)	10		22	22		10	30		12	12		30
Confl. Bikes (#/hr)						20						
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
Heavy Vehicles (%)	8%	8%	8%	0%	0%	0%	5%	5%	5%	3%	3%	8%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	359	0	0	15	0	0	527	0	0	463	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6	6	
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	19.5	19.5		19.5	19.5		22.5	22.5		22.5	22.5	
Total Split (s)	45.0	45.0		45.0	45.0		45.0	45.0		45.0	45.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.5			-1.5			-1.5			-1.5	
Total Lost Time (s)		4.0			4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)		48.6			48.6			33.4			33.4	
Actuated g/C Ratio		0.54			0.54			0.37			0.37	
v/c Ratio		0.54			0.02			0.79			0.66	
Control Delay		17.6			10.2			21.5			6.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		17.6			10.2			21.5			6.3	
LOS		B			B			C			A	
Approach Delay		17.6			10.2			21.5			6.3	
Approach LOS		B			B			C			A	
Queue Length 50th (ft)		183			3			111			52	
Queue Length 95th (ft)		m260			14			145			m55	
Internal Link Dist (ft)		259			224			423			354	
Turn Bay Length (ft)												
Base Capacity (vph)		663			877			819			805	
Starvation Cap Reductn		0			0			2			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.54			0.02			0.65			0.58	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 36 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 15.2	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: 3: S Union St & Howell St



Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	89	342	26	93	0	6	6	455	0	0	515	153
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	12	13	12	12	12	12	10	12	12	12	12
Storage Length (ft)	80		0	0		0	100		100	0		100
Storage Lanes	1		1	0		0	1		0	0		0
Taper Length (ft)	75			25			75			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		805			503			741			446	
Travel Time (s)		18.3			11.4			16.8			10.1	
Confl. Peds. (#/hr)	30		12	12		30	32		10	10		32
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
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	94	360	27	0	104	0	6	479	0	0	703	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA			NA	
Protected Phases		8			4			2			6	
Permitted Phases	8		8	4			2					
Detector Phase	8	8	8	4	4		2	2			6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		9.0	9.0			9.0	
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0		24.0	24.0			24.0	
Total Split (s)	33.0	33.0	33.0	33.0	33.0		57.0	57.0			57.0	
Total Split (%)	36.7%	36.7%	36.7%	36.7%	36.7%		63.3%	63.3%			63.3%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0			4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0			2.0	
Lost Time Adjust (s)	-1.5	-1.5	-1.5		-1.5		-1.5	-1.5			-1.5	
Total Lost Time (s)	4.5	4.5	4.5		4.5		4.5	4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Min	Min	Min	Min	Min		C-Max	C-Max			C-Max	
Act Effct Green (s)	23.8	23.8	23.8		23.8		57.2	57.2			57.2	
Actuated g/C Ratio	0.26	0.26	0.26		0.26		0.64	0.64			0.64	
v/c Ratio	0.31	0.75	0.06		0.67		0.02	0.43			0.63	
Control Delay	28.2	40.5	6.2		30.3		5.3	6.7			13.7	
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0			0.0	
Total Delay	28.2	40.5	6.2		30.3		5.3	6.7			13.7	
LOS	C	D	A		C		A	A			B	
Approach Delay		36.1			30.3			6.7			13.7	
Approach LOS		D			C			A			B	
Queue Length 50th (ft)	42	186	0		10		0	70			215	
Queue Length 95th (ft)	80	267	15		m#45		m2	137			378	
Internal Link Dist (ft)		725			423			661			366	
Turn Bay Length (ft)	80						100					
Base Capacity (vph)	358	573	501		179		334	1105			1110	
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	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Reduced v/c Ratio	0.26	0.63	0.05		0.58		0.02	0.43			0.63	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 75 (83%), Referenced to phase 2:NETL and 6:SWT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 18.9	Intersection LOS: B
Intersection Capacity Utilization 76.4%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 5: Monroe Ave & S Union St

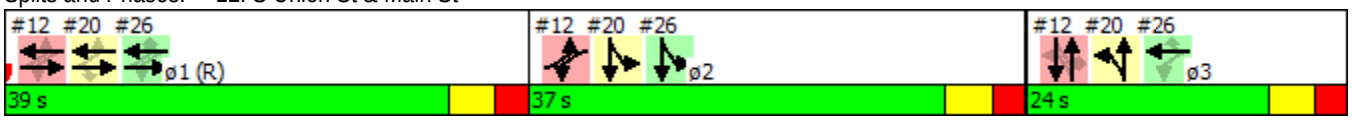
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	775	0	198	1011	28	5	106	125	34	0	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	13	10	10	10	12	12	12	12	12	12
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	40			75			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		279			1119			376			743	
Travel Time (s)		6.3			25.4			8.5			16.9	
Confl. Peds. (#/hr)	11		14	14		11	14		11	11		14
Confl. Bikes (#/hr)												20
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
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	861	0	220	1154	0	0	124	139	0	151	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	2	1		2	1			3			3	
Permitted Phases	1			1			3		3	3		
Detector Phase	2	1		2	1		3	3	3	3	3	
Switch Phase												
Minimum Initial (s)	6.0	7.0		6.0	7.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	15.0	31.0		15.0	31.0		15.0	15.0	15.0	15.0	15.0	
Total Split (s)	37.0	39.0		37.0	39.0		24.0	24.0	24.0	24.0	24.0	
Total Split (%)	37.0%	39.0%		37.0%	39.0%		24.0%	24.0%	24.0%	24.0%	24.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5			-1.5	-1.5		-1.5	
Total Lost Time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	
Lead/Lag	Lag	Lead		Lag	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	C-Max		None	C-Max		Max	Max	Max	Max	Max	
Act Effct Green (s)	64.5	34.5		64.5	34.5			22.0	22.0		22.0	
Actuated g/C Ratio	0.64	0.34		0.64	0.34			0.22	0.22		0.22	
v/c Ratio	0.13	0.57		0.38	0.76			0.31	0.31		0.37	
Control Delay	2.3	32.5		14.3	33.0			47.3	26.3		14.2	
Queue Delay	0.0	1.3		0.0	0.0			0.0	0.0		0.0	
Total Delay	2.3	33.8		14.3	33.0			47.3	26.3		14.2	
LOS	A	C		B	C			D	C		B	
Approach Delay		31.5			30.0			36.2			14.2	
Approach LOS		C			C			D			B	
Queue Length 50th (ft)	2	134		40	236			81	43		20	
Queue Length 95th (ft)	m6	184		65	291			142	93		77	
Internal Link Dist (ft)		199			1039			296			663	
Turn Bay Length (ft)	100			100								
Base Capacity (vph)	568	1518		624	1513			403	446		403	
Starvation Cap Reductn	0	421		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.12	0.78		0.35	0.76			0.31	0.31		0.37	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 44 (44%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 30.3 Intersection LOS: C
Intersection Capacity Utilization 57.3% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 12: S Union St & Main St



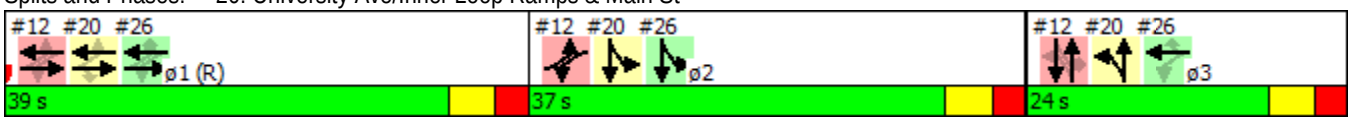
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	339	137	0	602	516	208	344	3	493	396	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	11	12	12	10	10	10
Storage Length (ft)	95		0	0		0	0		0	225		225
Storage Lanes	1		1	0		0	1		0	1		1
Taper Length (ft)	35			25			25			40		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			40	
Link Distance (ft)		323			279			291			431	
Travel Time (s)		7.3			6.3			6.6			7.3	
Confl. Peds. (#/hr)	30		12	12		30			6	6		
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
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)			10%				14%			40%		
Lane Group Flow (vph)	11	392	137	0	1242	0	199	417	0	329	672	0
Turn Type	Perm	NA	Perm		NA		Split	NA		Split	NA	
Protected Phases		1			1		3	3		2	2	
Permitted Phases	1		1									
Detector Phase	1	1	1		1		3	3		2	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0		7.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	31.0	31.0	31.0		31.0		15.0	15.0		15.0	15.0	
Total Split (s)	39.0	39.0	39.0		39.0		24.0	24.0		37.0	37.0	
Total Split (%)	39.0%	39.0%	39.0%		39.0%		24.0%	24.0%		37.0%	37.0%	
Yellow Time (s)	3.5	3.5	3.5		3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.5	2.5	2.5		2.5		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)	-1.5	-1.5	-1.5		-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lead	Lead		Lead					Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes		Yes					Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max		C-Max		Max	Max		None	None	
Act Effct Green (s)	34.5	34.5	34.5		34.5		22.0	22.0		30.0	30.0	
Actuated g/C Ratio	0.34	0.34	0.34		0.34		0.22	0.22		0.30	0.30	
v/c Ratio	0.17	0.39	0.27		0.92dr		0.58	0.56		0.73	0.72	
Control Delay	29.3	24.4	8.4		7.8		36.2	31.8		41.4	35.8	
Queue Delay	0.0	0.1	0.0		0.5		0.2	0.3		0.0	0.1	
Total Delay	29.3	24.5	8.4		8.3		36.4	32.1		41.4	35.9	
LOS	C	C	A		A		D	C		D	D	
Approach Delay		20.5			8.3			33.5			37.7	
Approach LOS		C			A			C			D	
Queue Length 50th (ft)	4	67	0		17		131	137		197	200	
Queue Length 95th (ft)	m12	90	25		36		#216	191		307	267	
Internal Link Dist (ft)		243			199			211			351	
Turn Bay Length (ft)	95									225		
Base Capacity (vph)	64	1007	508		1535		342	742		488	1010	
Starvation Cap Reductn	0	0	0		68		9	52		0	0	
Spillback Cap Reductn	0	68	0		0		0	0		0	24	
Storage Cap Reductn	0	0	0		0		0	0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.17	0.42	0.27		0.85		0.60	0.60		0.67	0.68	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 44 (44%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 23.5 Intersection LOS: C
Intersection Capacity Utilization 63.2% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 20: University Ave/Inner Loop Ramps & Main St

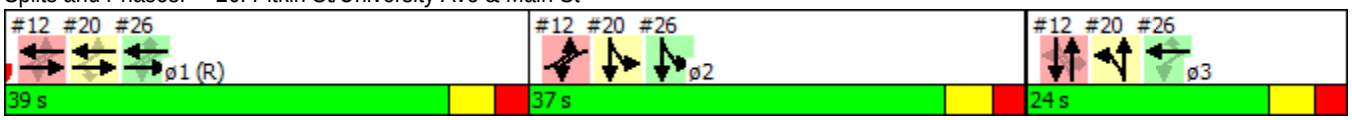


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	287	6	10	550	262	0	0	0	198	27	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	13	10	11	11	12	12	12	12	12	12
Storage Length (ft)	50		0	100		0	0		0	180		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			35			25			75		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		798			323			684			1114	
Travel Time (s)		18.1			7.3			18.7			25.3	
Confl. Peds. (#/hr)	13		11	11		13	5		12	12		5
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
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	6	326	0	11	611	291	0	0	0	220	31	0
Turn Type	Perm	NA		Perm	NA	Perm				Split	NA	
Protected Phases		1			1 3					2	2	
Permitted Phases	1			1 3		1 3						
Detector Phase	1	1		1 3	1 3	1 3				2	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0								6.0	6.0	
Minimum Split (s)	31.0	31.0								15.0	15.0	
Total Split (s)	39.0	39.0								37.0	37.0	
Total Split (%)	39.0%	39.0%								37.0%	37.0%	
Yellow Time (s)	3.5	3.5								3.5	3.5	
All-Red Time (s)	2.5	2.5								2.5	2.5	
Lost Time Adjust (s)	-1.5	-1.5								-1.5	-1.5	
Total Lost Time (s)	4.5	4.5								4.5	4.5	
Lead/Lag	Lead	Lead								Lag	Lag	
Lead-Lag Optimize?	Yes	Yes								Yes	Yes	
Recall Mode	C-Max	C-Max								None	None	
Act Effct Green (s)	34.5	34.5		61.0	61.0	61.0				30.0	30.0	
Actuated g/C Ratio	0.34	0.34		0.61	0.61	0.61				0.30	0.30	
v/c Ratio	0.09	0.30		0.02	0.32	0.31				0.21	0.06	
Control Delay	26.8	24.7		6.8	6.2	1.3				26.1	23.2	
Queue Delay	0.0	0.0		0.0	0.3	0.5				0.0	0.0	
Total Delay	26.8	24.7		6.8	6.6	1.8				26.1	23.2	
LOS	C	C		A	A	A				C	C	
Approach Delay		24.7			5.1						25.7	
Approach LOS		C			A						C	
Queue Length 50th (ft)	3	78		2	44	0				51	13	
Queue Length 95th (ft)	13	114		m2	m53	m6				80	34	
Internal Link Dist (ft)		718			243			604			1034	
Turn Bay Length (ft)	50			100						180		
Base Capacity (vph)	64	1091		537	1934	938				1115	602	
Starvation Cap Reductn	0	0		0	722	328				0	0	
Spillback Cap Reductn	0	0		0	0	0				0	0	
Storage Cap Reductn	0	0		0	0	0				0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.09	0.30		0.02	0.50	0.48				0.20	0.05	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 44 (44%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 12.9	Intersection LOS: B
Intersection Capacity Utilization 32.5%	ICU Level of Service A
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 26: Pitkin St/University Ave & Main St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	523	0	25	502	43	53	183	70	0	198	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		0.95			0.95			0.95			1.00	
Frpb, ped/bikes		1.00			1.00			0.99			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.99			0.97			1.00	
Flt Protected		1.00			1.00			0.99			1.00	
Satd. Flow (prot)		3536			3484			3369			1863	
Flt Permitted		0.94			0.91			0.70			1.00	
Satd. Flow (perm)		3333			3181			2385			1863	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	11	581	0	28	558	48	59	203	78	0	220	0
RTOR Reduction (vph)	0	0	0	0	5	0	0	32	0	0	0	0
Lane Group Flow (vph)	0	592	0	0	629	0	0	308	0	0	220	0
Confl. Peds. (#/hr)	6		8	8		6	1		6	6		1
Confl. Bikes (#/hr)												20
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		64.9			64.9			17.1			17.1	
Effective Green, g (s)		66.4			66.4			18.6			18.6	
Actuated g/C Ratio		0.66			0.66			0.19			0.19	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		2213			2112			443			346	
v/s Ratio Prot											0.12	
v/s Ratio Perm		0.18			c0.20			c0.13				
v/c Ratio		0.27			0.30			0.70			0.64	
Uniform Delay, d1		6.9			7.0			38.1			37.6	
Progression Factor		0.35			1.00			1.00			1.17	
Incremental Delay, d2		0.2			0.4			4.7			3.6	
Delay (s)		2.7			7.4			42.8			47.7	
Level of Service		A			A			D			D	
Approach Delay (s)		2.7			7.4			42.8			47.7	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	20	10	5	43	15	26	575	13	15	630	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	17	22	11	6	48	17	29	639	14	17	700	6
Pedestrians		30			29			10			10	
Lane Width (ft)		12.0			10.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			2			1			1	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								655			637	
pX, platoon unblocked	0.94	0.94	0.90	0.94	0.94	0.89	0.90			0.89		
vC, conflicting volume	1194	1506	743	1501	1502	366	736			682		
vC1, stage 1 conf vol	766	766		733	733							
vC2, stage 2 conf vol	428	740		768	769							
vCu, unblocked vol	746	1080	657	1074	1075	26	649			383		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.2			4.2		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	93	97	98	85	98	96			98		
cM capacity (veh/h)	333	330	354	267	318	899	800			1005		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	50	70	348	334	722
Volume Left	17	6	29	0	17
Volume Right	11	17	0	14	6
cSH	336	369	800	1700	1005
Volume to Capacity	0.15	0.19	0.04	0.20	0.02
Queue Length 95th (ft)	13	17	3	0	1
Control Delay (s)	17.6	17.0	1.2	0.0	0.4
Lane LOS	C	C	A		A
Approach Delay (s)	17.6	17.0	0.6		0.4
Approach LOS	C	C			

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	231	489	0	23	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	257	543	0	26	11
Pedestrians		22	15		57	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		2	1		5	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			148			
pX, platoon unblocked	0.72				0.72	0.72
vC, conflicting volume	600				872	622
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	246				625	277
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				92	98
cM capacity (veh/h)	894				304	513

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	257	543	37
Volume Left	0	0	26
Volume Right	0	0	11
cSH	1700	1700	347
Volume to Capacity	0.15	0.32	0.11
Queue Length 95th (ft)	0	0	9
Control Delay (s)	0.0	0.0	16.6
Lane LOS			C
Approach Delay (s)	0.0	0.0	16.6
Approach LOS			C

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	0	432	0	0	20	315	280	0	0	218	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	11	0	480	0	0	22	350	311	0	0	242	6
Pedestrians		30			6						10	
Lane Width (ft)		12.0			12.0						12.0	
Walking Speed (ft/s)		4.0			4.0						4.0	
Percent Blockage		3			1						1	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								974			318	
pX, platoon unblocked	0.91	0.91	0.89	0.91	0.91	0.97	0.89			0.97		
vC, conflicting volume	1318	1292	275	1742	1295	327	278			317		
vC1, stage 1 conf vol	275	275		1017	1017							
vC2, stage 2 conf vol	1043	1017		725	278							
vCu, unblocked vol	1229	1200	127	1697	1203	293	130			283		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	100	40	100	100	97	72			100		
cM capacity (veh/h)	184	214	803	21	205	720	1250			1226		

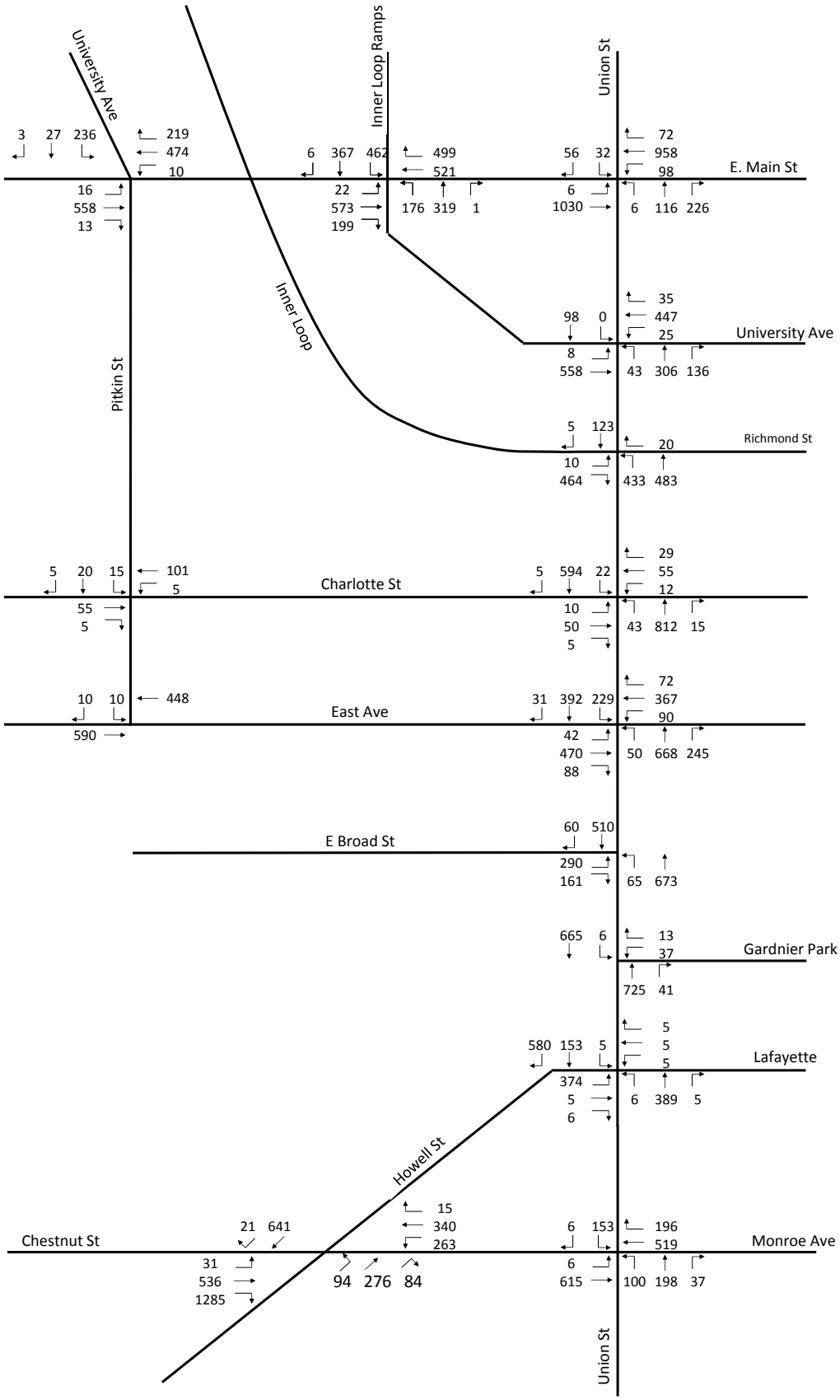
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	491	22	350	311	248
Volume Left	11	0	350	0	0
Volume Right	480	22	0	0	6
cSH	746	720	1250	1700	1700
Volume to Capacity	0.66	0.03	0.28	0.18	0.15
Queue Length 95th (ft)	125	2	29	0	0
Control Delay (s)	18.6	10.2	9.0	0.0	0.0
Lane LOS	C	B	A		
Approach Delay (s)	18.6	10.2	4.8		0.0
Approach LOS	C	B			

Intersection Summary				
Average Delay		8.8		
Intersection Capacity Utilization		74.2%	ICU Level of Service	D
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	35	5	2	70	0	0	0	0	10	33	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	0	39	6	2	78	0	0	0	0	11	37	6
Pedestrians		10			10			10			10	
Lane Width (ft)		12.0			12.0			0.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	88			54			168	144	62	144	147	98
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	88			54			168	144	62	144	147	98
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	99	95	99
cM capacity (veh/h)	1495			1551			754	744	1001	808	739	945

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	44	80	53
Volume Left	0	2	11
Volume Right	6	0	6
cSH	1700	1551	770
Volume to Capacity	0.03	0.00	0.07
Queue Length 95th (ft)	0	0	6
Control Delay (s)	0.0	0.2	10.0
Lane LOS		A	B
Approach Delay (s)	0.0	0.2	10.0
Approach LOS			B

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	24.7%	ICU Level of Service	A
Analysis Period (min)	15		



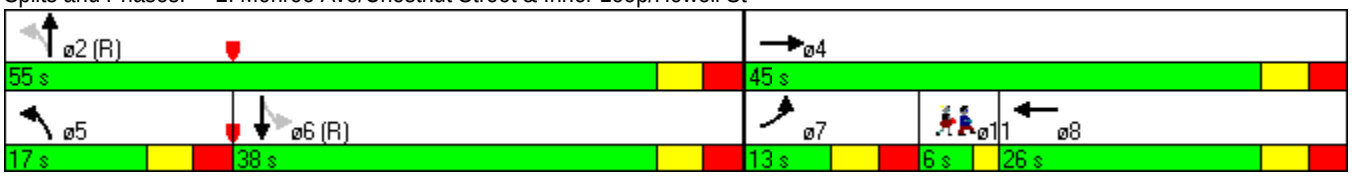
Stantec 61 Commercial Street Rochester, New York 14614 T: (585) 475-1440	**ROCHESTER INNER LOOP ALTERNATIVES ANALYSIS**	**EXHIBIT 3.7** **2035 Future BaseTraffic Volumes** **PM Peak Hour (4:30 PM - 5:30 PM)**

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	94	276	84	0	641	21	263	340	15	31	536	1285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	0		175	250		0	100		0
Storage Lanes	1		0	0		1	1		0	1		1
Taper Length (ft)	75			75			75			75		
Right Turn on Red			Yes			No			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		973			457			741			768	
Travel Time (s)		22.1			10.4			16.8			17.5	
Confl. Peds. (#/hr)	30		30	30		30	14		41	41		
Confl. Bikes (#/hr)						20						
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	99	379	0	0	697	0	277	374	0	33	564	1353
Turn Type	Prot	NA			NA		pm+pt	NA		Perm	NA	Free
Protected Phases	7	4			8		5	2			6	
Permitted Phases							2			6		Free
Detector Phase	7	4			8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	10.0			10.0		7.0	10.0		10.0	10.0	
Minimum Split (s)	10.5	22.5			22.5		13.5	23.5		23.5	23.5	
Total Split (s)	13.0	45.0			26.0		17.0	55.0		38.0	38.0	
Total Split (%)	13.0%	45.0%			26.0%		17.0%	55.0%		38.0%	38.0%	
Yellow Time (s)	3.5	3.5			3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.5	-1.5			-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead						Lead			Lag	Lag	
Lead-Lag Optimize?	Yes						Yes			Yes	Yes	
Recall Mode	None	Min			Min		None	C-Max		C-Max	C-Max	
Act Effct Green (s)	8.0	40.0			21.0		50.0	50.0		33.0	33.0	100.0
Actuated g/C Ratio	0.08	0.40			0.21		0.50	0.50		0.33	0.33	1.00
v/c Ratio	0.70	0.53			0.95		0.97	0.41		0.11	0.92	0.85
Control Delay	71.5	25.1			62.1		74.4	18.6		24.6	54.5	6.6
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	71.5	25.1			62.1		74.4	18.6		24.6	54.5	6.6
LOS	E	C			E		E	B		C	D	A
Approach Delay		34.7			62.1			42.3			20.7	
Approach LOS		C			E			D			C	
Queue Length 50th (ft)	63	172			232		153	126		15	343	0
Queue Length 95th (ft)	#142	262			#346		#297	257		38	#548	0
Internal Link Dist (ft)		893			377			661			688	
Turn Bay Length (ft)	200						250			100		
Base Capacity (vph)	141	711			737		286	922		307	614	1583
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	0.70	0.53			0.95		0.97	0.41		0.11	0.92	0.85

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 33.9	Intersection LOS: C
Intersection Capacity Utilization 83.1%	ICU Level of Service E
Analysis Period (min) 15	

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Monroe Ave/Chestnut Street & Inner Loop/Howell St



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø11
Lane Configurations							
Volume (vph)	290	161	65	673	510	60	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0	0	100			0	
Storage Lanes	1	1	1			0	
Taper Length (ft)	25		75				
Right Turn on Red		No				No	
Link Speed (mph)	30			30	30		
Link Distance (ft)	134			240	437		
Travel Time (s)	3.0			5.5	9.9		
Confl. Peds. (#/hr)		43	30			30	
Confl. Bikes (#/hr)						20	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	
Heavy Vehicles (%)	2%	2%	1%	1%	2%	2%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	337	187	76	783	663	0	
Turn Type	NA	Perm	Prot	NA	NA		
Protected Phases	4		5	2	6		11
Permitted Phases		4					
Detector Phase	4	4	5	2	6		
Switch Phase							
Minimum Initial (s)	10.0	10.0	8.0	20.0	20.0		3.0
Minimum Split (s)	24.5	24.5	13.5	25.5	25.5		6.0
Total Split (s)	26.0	26.0	14.0	64.0	44.0		6.0
Total Split (%)	28.9%	28.9%	15.6%	71.1%	48.9%		7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		0.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5		
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		
Lead/Lag			Lead				Lag
Lead-Lag Optimize?			Yes				Yes
Recall Mode	None	None	None	C-Max	C-Max		Max
Act Effct Green (s)	20.8	20.8	9.8	61.2	40.0		
Actuated g/C Ratio	0.23	0.23	0.11	0.68	0.44		
v/c Ratio	0.82	0.58	0.39	0.61	0.82		
Control Delay	50.5	38.4	38.0	12.0	20.0		
Queue Delay	0.0	0.0	0.0	0.0	0.4		
Total Delay	50.5	38.4	38.0	12.0	20.4		
LOS	D	D	D	B	C		
Approach Delay	46.2			14.3	20.4		
Approach LOS	D			B	C		
Queue Length 50th (ft)	179	93	43	232	149		
Queue Length 95th (ft)	#284	153	m69	340	m167		
Internal Link Dist (ft)	54			160	357		
Turn Bay Length (ft)			100				
Base Capacity (vph)	432	340	198	1278	805		
Starvation Cap Reductn	0	0	0	0	16		
Spillback Cap Reductn	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø11
Reduced v/c Ratio	0.78	0.55	0.38	0.61	0.84		

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 82 (91%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 24.5	Intersection LOS: C
Intersection Capacity Utilization 63.5%	ICU Level of Service B
Analysis Period (min) 15	

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

Splits and Phases: 23: S Union St & E Broad St

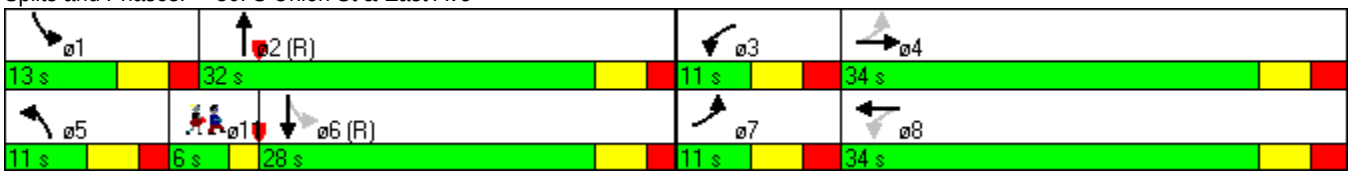
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	470	88	90	367	72	50	668	245	229	392	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	175		0	100		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	75			75			75			75		
Right Turn on Red			No			Yes			Yes			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		148			496			437			655	
Travel Time (s)		3.4			11.3			9.9			14.9	
Confl. Peds. (#/hr)	27		50	50		27	62		27	27		62
Confl. Bikes (#/hr)												20
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
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	620	0	100	488	0	56	1014	0	254	470	0
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8						6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	20.0		5.0	20.0		5.0	20.0		5.0	20.0	
Minimum Split (s)	11.0	28.0		11.0	28.0		10.5	25.5		10.5	25.5	
Total Split (s)	11.0	34.0		11.0	34.0		11.0	32.0		13.0	28.0	
Total Split (%)	12.2%	37.8%		12.2%	37.8%		12.2%	35.6%		14.4%	31.1%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead					
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes					
Recall Mode	None	Min		None	Min		None	C-Max		None	C-Max	
Act Effct Green (s)	36.9	31.7		37.8	33.9		7.0	28.0		33.0	24.0	
Actuated g/C Ratio	0.41	0.35		0.42	0.38		0.08	0.31		0.37	0.27	
v/c Ratio	0.16	0.99		0.50	0.72		0.41	0.95		0.93	0.97	
Control Delay	15.5	65.2		23.6	32.4		47.7	42.8		60.7	69.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.4		0.0	0.0	
Total Delay	15.5	65.2		23.6	32.4		47.7	43.2		60.7	69.4	
LOS	B	E		C	C		D	D		E	E	
Approach Delay		61.7			30.9			43.4			66.3	
Approach LOS		E			C			D			E	
Queue Length 50th (ft)	15	~392		32	248		30	190		89	264	
Queue Length 95th (ft)	34	#596		62	#414		m48	#319		#231	#459	
Internal Link Dist (ft)		68			416			357			575	
Turn Bay Length (ft)				175			100			250		
Base Capacity (vph)	289	628		201	679		137	1071		273	483	
Starvation Cap Reductn	0	0		0	0		0	5		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.16	0.99		0.50	0.72		0.41	0.95		0.93	0.97	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green, Master Intersection
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 50.5 Intersection LOS: D
Intersection Capacity Utilization 89.5% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 30: S Union St & East Ave

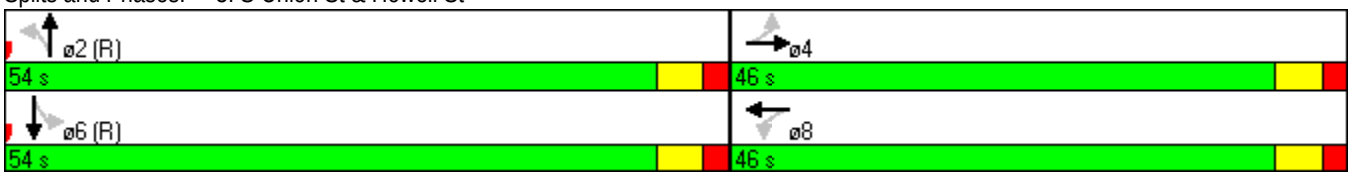


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	374	5	6	5	5	5	6	389	5	5	153	580
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	150		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			75		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			25			30			30	
Link Distance (ft)		339			304			503			434	
Travel Time (s)		7.7			8.3			11.4			9.9	
Confl. Peds. (#/hr)	41		14	14		41	30		52	52		30
Confl. Bikes (#/hr)												20
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	405	0	0	15	0	0	420	0	0	777	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6	6	
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	19.5	19.5		19.5	19.5		22.5	22.5		22.5	22.5	
Total Split (s)	46.0	46.0		46.0	46.0		54.0	54.0		54.0	54.0	
Total Split (%)	46.0%	46.0%		46.0%	46.0%		54.0%	54.0%		54.0%	54.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.5			-1.5			-1.5			-1.5	
Total Lost Time (s)		4.0			4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)		46.2			46.2			45.8			45.8	
Actuated g/C Ratio		0.46			0.46			0.46			0.46	
v/c Ratio		0.76			0.02			0.50			0.93	
Control Delay		28.1			13.8			17.4			22.7	
Queue Delay		0.0			0.0			0.3			0.0	
Total Delay		28.1			13.8			17.6			22.7	
LOS		C			B			B			C	
Approach Delay		28.1			13.8			17.6			22.7	
Approach LOS		C			B			B			C	
Queue Length 50th (ft)		268			4			116			92	
Queue Length 95th (ft)		m#408			16			158			#171	
Internal Link Dist (ft)		259			224			423			354	
Turn Bay Length (ft)												
Base Capacity (vph)		532			706			919			885	
Starvation Cap Reductn		0			0			120			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.76			0.02			0.53			0.88	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 19 (19%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 22.6	Intersection LOS: C
Intersection Capacity Utilization 83.7%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 3: S Union St & Howell St



Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	100	198	37	153	0	6	6	615	0	0	519	196
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	12	13	12	12	12	12	10	12	12	12	12
Storage Length (ft)	80		0	0		0	100		100	0		100
Storage Lanes	1		1	0		0	1		0	0		0
Taper Length (ft)	75			25			75			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		805			503			741			446	
Travel Time (s)		18.3			11.4			16.8			10.1	
Confl. Peds. (#/hr)			52	52			45		64	64		45
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
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	105	208	39	0	167	0	6	647	0	0	752	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA			NA	
Protected Phases		8			4			2			6	
Permitted Phases	8		8	4			2					
Detector Phase	8	8	8	4	4		2	2			6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		9.0	9.0			9.0	
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0		24.0	24.0			24.0	
Total Split (s)	36.0	36.0	36.0	36.0	36.0		64.0	64.0			64.0	
Total Split (%)	36.0%	36.0%	36.0%	36.0%	36.0%		64.0%	64.0%			64.0%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0			4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0			2.0	
Lost Time Adjust (s)	-1.5	-1.5	-1.5		-1.5		-1.5	-1.5			-1.5	
Total Lost Time (s)	4.5	4.5	4.5		4.5		4.5	4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max			C-Max	
Act Effct Green (s)	22.5	22.5	22.5		22.5		68.5	68.5			68.5	
Actuated g/C Ratio	0.22	0.22	0.22		0.22		0.68	0.68			0.68	
v/c Ratio	0.35	0.50	0.12		0.86		0.02	0.54			0.64	
Control Delay	33.7	36.3	9.0		40.6		10.8	13.1			13.1	
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0			0.0	
Total Delay	33.7	36.3	9.0		40.6		10.8	13.1			13.1	
LOS	C	D	A		D		B	B			B	
Approach Delay		32.5			40.6			13.1			13.1	
Approach LOS		C			D			B			B	
Queue Length 50th (ft)	56	115	0		42		1	139			230	
Queue Length 95th (ft)	93	165	24		m66		m2	m244			460	
Internal Link Dist (ft)		725			423			661			366	
Turn Bay Length (ft)	80						100					
Base Capacity (vph)	415	586	449		258		360	1202			1179	
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	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Reduced v/c Ratio	0.25	0.35	0.09		0.65		0.02	0.54			0.64	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 80 (80%), Referenced to phase 2:NETL and 6:SWT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 19.1	Intersection LOS: B
Intersection Capacity Utilization 73.2%	ICU Level of Service D
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 5: Monroe Ave & S Union St

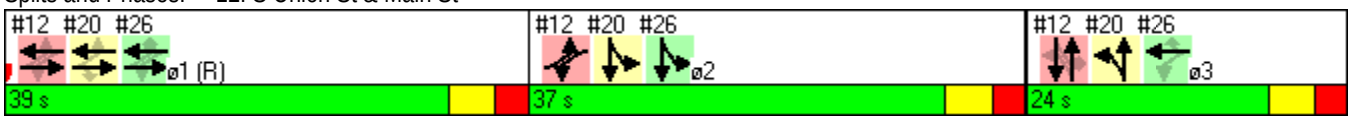
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	1030	0	98	958	72	6	116	226	32	0	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	13	10	10	10	12	12	12	12	12	12
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	40			75			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		279			1119			376			743	
Travel Time (s)		6.3			25.4			8.5			16.9	
Confl. Peds. (#/hr)	8		17	17		8	17		15	15		17
Confl. Bikes (#/hr)												20
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
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	1144	0	109	1144	0	0	136	251	0	98	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	2	1		2	1			3			3	
Permitted Phases	1			1			3		3	3		
Detector Phase	2	1		2	1		3	3	3	3	3	
Switch Phase												
Minimum Initial (s)	6.0	7.0		6.0	7.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	15.0	31.0		15.0	31.0		15.0	15.0	15.0	15.0	15.0	
Total Split (s)	37.0	39.0		37.0	39.0		24.0	24.0	24.0	24.0	24.0	
Total Split (%)	37.0%	39.0%		37.0%	39.0%		24.0%	24.0%	24.0%	24.0%	24.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5			-1.5	-1.5		-1.5	
Total Lost Time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	
Lead/Lag	Lag	Lead		Lag	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	C-Max		None	C-Max		Max	Max	Max	Max	Max	
Act Effct Green (s)	63.3	34.5		63.3	34.5			23.2	23.2		23.2	
Actuated g/C Ratio	0.63	0.34		0.63	0.34			0.23	0.23		0.23	
v/c Ratio	0.01	0.71		0.20	0.72			0.32	0.46		0.25	
Control Delay	1.0	27.2		12.3	31.3			48.3	19.2		9.0	
Queue Delay	0.0	2.3		0.0	0.0			0.0	0.5		0.0	
Total Delay	1.0	29.4		12.3	31.3			48.3	19.7		9.0	
LOS	A	C		B	C			D	B		A	
Approach Delay		29.3			29.6			29.7			9.0	
Approach LOS		C			C			C			A	
Queue Length 50th (ft)	0	137		20	227			65	64		0	
Queue Length 95th (ft)	m0	185		34	280			122	122		43	
Internal Link Dist (ft)		199			1039			296			663	
Turn Bay Length (ft)	100			100								
Base Capacity (vph)	609	1621		603	1594			426	547		393	
Starvation Cap Reductn	0	329		0	0			0	79		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.01	0.89		0.18	0.72			0.32	0.54		0.25	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 64 (64%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 28.8 Intersection LOS: C
Intersection Capacity Utilization 52.9% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 12: S Union St & Main St

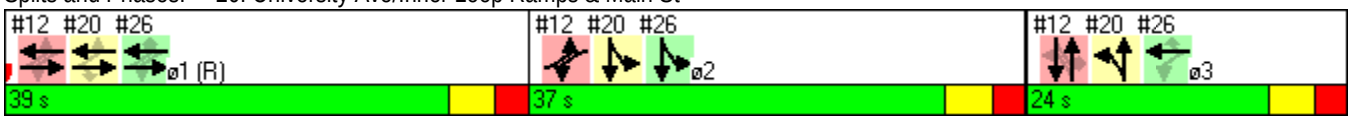


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	573	199	0	521	499	176	319	1	462	367	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	11	12	12	10	10	10
Storage Length (ft)	95		0	0		0	0		0	225		225
Storage Lanes	1		1	0		0	1		0	1		1
Taper Length (ft)	35			25			25			40		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			40	
Link Distance (ft)		323			279			291			431	
Travel Time (s)		7.3			6.3			6.6			7.3	
Confl. Peds. (#/hr)	23		26	26		23			10	10		
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
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)			10%				10%			41%		
Lane Group Flow (vph)	24	659	199	0	1133	0	176	375	0	303	625	0
Turn Type	Perm	NA	Perm		NA		Split	NA		Split	NA	
Protected Phases		1			1		3	3		2	2	
Permitted Phases	1		1									
Detector Phase	1	1	1		1		3	3		2	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0		7.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	31.0	31.0	31.0		31.0		15.0	15.0		15.0	15.0	
Total Split (s)	39.0	39.0	39.0		39.0		24.0	24.0		37.0	37.0	
Total Split (%)	39.0%	39.0%	39.0%		39.0%		24.0%	24.0%		37.0%	37.0%	
Yellow Time (s)	3.5	3.5	3.5		3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.5	2.5	2.5		2.5		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)	-1.5	-1.5	-1.5		-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lead	Lead		Lead					Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes		Yes					Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max		C-Max		Max	Max		None	None	
Act Effct Green (s)	34.5	34.5	34.5		34.5		23.2	23.2		28.8	28.8	
Actuated g/C Ratio	0.34	0.34	0.34		0.34		0.23	0.23		0.29	0.29	
v/c Ratio	0.31	0.62	0.35		0.70		0.49	0.48		0.70	0.70	
Control Delay	27.5	21.0	4.6		3.6		45.2	42.1		40.6	35.8	
Queue Delay	0.0	0.5	0.3		0.2		0.5	0.4		0.0	0.1	
Total Delay	27.5	21.5	4.9		3.8		45.7	42.5		40.6	36.0	
LOS	C	C	A		A		D	D		D	D	
Approach Delay		17.9			3.8			43.6			37.5	
Approach LOS		B			A			D			D	
Queue Length 50th (ft)	6	87	0		6		128	136		183	189	
Queue Length 95th (ft)	m12	108	23		4		203	187		280	246	
Internal Link Dist (ft)		243			199			211			351	
Turn Bay Length (ft)	95									225		
Base Capacity (vph)	78	1066	564		1618		361	785		488	1009	
Starvation Cap Reductn	0	90	96		86		33	119		0	0	
Spillback Cap Reductn	0	125	2		0		0	0		0	37	
Storage Cap Reductn	0	0	0		0		0	0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.31	0.70	0.43		0.74		0.54	0.56		0.62	0.64	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 64 (64%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 22.6	Intersection LOS: C
Intersection Capacity Utilization 58.7%	ICU Level of Service B
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 20: University Ave/Inner Loop Ramps & Main St

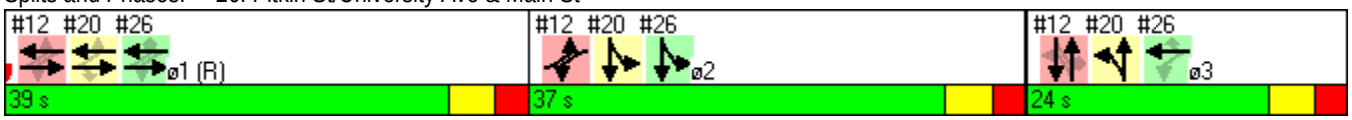


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	16	558	13	10	474	219	0	0	0	236	27	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	13	10	11	11	12	12	12	12	12	12
Storage Length (ft)	50		0	100		0	0		0	180		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			35			25			75		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		798			323			684			1114	
Travel Time (s)		18.1			7.3			18.7			25.3	
Confl. Peds. (#/hr)	7		27	27		7				22		21
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
Heavy Vehicles (%)	5%	5%	5%	2%	2%	2%	2%	2%	2%	1%	1%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	18	634	0	11	527	243	0	0	0	262	33	0
Turn Type	Perm	NA		Perm	NA	Perm				Split	NA	
Protected Phases		1			1 3					2	2	
Permitted Phases	1			1 3		1 3						
Detector Phase	1	1		1 3	1 3	1 3				2	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0								6.0	6.0	
Minimum Split (s)	31.0	31.0								15.0	15.0	
Total Split (s)	39.0	39.0								37.0	37.0	
Total Split (%)	39.0%	39.0%								37.0%	37.0%	
Yellow Time (s)	3.5	3.5								3.5	3.5	
All-Red Time (s)	2.5	2.5								2.5	2.5	
Lost Time Adjust (s)	-1.5	-1.5								-1.5	-1.5	
Total Lost Time (s)	4.5	4.5								4.5	4.5	
Lead/Lag	Lead	Lead								Lag	Lag	
Lead-Lag Optimize?	Yes	Yes								Yes	Yes	
Recall Mode	C-Max	C-Max								None	None	
Act Effct Green (s)	34.5	34.5		62.2	62.2	62.2				28.8	28.8	
Actuated g/C Ratio	0.34	0.34		0.62	0.62	0.62				0.29	0.29	
v/c Ratio	0.27	0.56		0.03	0.25	0.24				0.26	0.06	
Control Delay	36.3	28.7		6.6	5.3	1.2				27.3	22.6	
Queue Delay	0.0	0.0		0.0	0.2	0.4				0.0	0.0	
Total Delay	36.3	28.7		6.6	5.5	1.5				27.3	22.6	
LOS	D	C		A	A	A				C	C	
Approach Delay		28.9			4.3						26.8	
Approach LOS		C			A						C	
Queue Length 50th (ft)	8	170		1	26	0				64	13	
Queue Length 95th (ft)	31	226		m3	52	m8				94	35	
Internal Link Dist (ft)		718			243			604			1034	
Turn Bay Length (ft)	50			100						180		
Base Capacity (vph)	67	1142		433	2128	1010				1126	603	
Starvation Cap Reductn	0	0		0	876	390				0	0	
Spillback Cap Reductn	0	0		0	0	0				0	0	
Storage Cap Reductn	0	0		0	0	0				0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.27	0.56		0.03	0.42	0.39				0.23	0.05	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 64 (64%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 17.4	Intersection LOS: B
Intersection Capacity Utilization 33.4%	ICU Level of Service A
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 26: Pitkin St/University Ave & Main St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	8	558	0	25	447	35	49	306	136	0	98	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		0.95			0.95			0.95			1.00	
Frpb, ped/bikes		1.00			1.00			0.99			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.99			0.96			1.00	
Flt Protected		1.00			1.00			1.00			1.00	
Satd. Flow (prot)		3537			3488			3344			1863	
Flt Permitted		0.95			0.90			0.91			1.00	
Satd. Flow (perm)		3350			3158			3051			1863	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	9	620	0	28	497	39	54	340	151	0	109	0
RTOR Reduction (vph)	0	0	0	0	5	0	0	44	0	0	0	0
Lane Group Flow (vph)	0	629	0	0	559	0	0	501	0	0	109	0
Confl. Peds. (#/hr)	4		5	5		4	2		11	11		2
Confl. Bikes (#/hr)												20
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		60.2			60.2			21.8			21.8	
Effective Green, g (s)		61.7			61.7			23.3			23.3	
Actuated g/C Ratio		0.62			0.62			0.23			0.23	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		2066			1948			710			434	
v/s Ratio Prot											0.06	
v/s Ratio Perm		c0.19			0.18			c0.16				
v/c Ratio		0.30			0.29			0.70			0.25	
Uniform Delay, d1		9.0			8.9			35.2			31.2	
Progression Factor		0.27			1.00			0.57			1.48	
Incremental Delay, d2		0.3			0.4			2.5			0.3	
Delay (s)		2.7			9.3			22.5			46.7	
Level of Service		A			A			C			D	
Approach Delay (s)		2.7			9.3			22.5			46.7	
Approach LOS		A			A			C			D	

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	50	5	12	55	29	43	812	15	22	594	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	11	56	6	13	61	32	48	902	17	24	660	6
Pedestrians		30			27			10			10	
Lane Width (ft)		12.0			10.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			2			1			1	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								655			637	
pX, platoon unblocked	0.77	0.77	0.98	0.77	0.77	0.76	0.98			0.76		
vC, conflicting volume	1361	1783	703	1788	1778	496	696			946		
vC1, stage 1 conf vol	742	742		1033	1033							
vC2, stage 2 conf vol	619	1041		755	744							
vCu, unblocked vol	793	1340	685	1346	1333	0	678			301		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	81	98	94	78	96	94			97		
cM capacity (veh/h)	320	289	369	217	279	803	868			939		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	72	107	499	468	690
Volume Left	11	13	48	0	24
Volume Right	6	32	0	17	6
cSH	298	333	868	1700	939
Volume to Capacity	0.24	0.32	0.06	0.28	0.03
Queue Length 95th (ft)	23	34	4	0	2
Control Delay (s)	20.9	20.8	1.5	0.0	0.7
Lane LOS	C	C	A		A
Approach Delay (s)	20.9	20.8	0.8		0.7
Approach LOS	C	C			

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	590	448	0	10	20
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	656	498	0	11	22
Pedestrians		27	14		26	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		2	1		2	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			148			
pX, platoon unblocked	0.76				0.76	0.76
vC, conflicting volume	524				1193	551
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	212				1095	247
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				94	96
cM capacity (veh/h)	1007				174	575

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	656	498	33
Volume Left	0	0	11
Volume Right	0	0	22
cSH	1700	1700	325
Volume to Capacity	0.39	0.29	0.10
Queue Length 95th (ft)	0	0	8
Control Delay (s)	0.0	0.0	17.3
Lane LOS			C
Approach Delay (s)	0.0	0.0	17.3
Approach LOS			C

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	0	464	0	0	20	433	483	0	0	123	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	11	0	516	0	0	22	481	537	0	0	137	6
Pedestrians		30			11						10	
Lane Width (ft)		12.0			12.0						12.0	
Walking Speed (ft/s)		4.0			4.0						4.0	
Percent Blockage		3			1						1	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								974			318	
pX, platoon unblocked	0.83	0.83	0.96	0.83	0.83	0.81	0.96			0.81		
vC, conflicting volume	1701	1679	169	2165	1682	558	172			548		
vC1, stage 1 conf vol	169	169		1510	1510							
vC2, stage 2 conf vol	1531	1510		655	172							
vCu, unblocked vol	1631	1606	113	2192	1609	333	116			320		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	84	100	41	100	100	96	65			100		
cM capacity (veh/h)	71	93	879	8	92	562	1378			992		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	527	22	481	537	142
Volume Left	11	0	481	0	0
Volume Right	516	22	0	0	6
cSH	708	562	1378	1700	1700
Volume to Capacity	0.74	0.04	0.35	0.32	0.08
Queue Length 95th (ft)	168	3	40	0	0
Control Delay (s)	23.3	11.7	9.0	0.0	0.0
Lane LOS	C	B	A		
Approach Delay (s)	23.3	11.7	4.3		0.0
Approach LOS	C	B			

Intersection Summary			
Average Delay	9.9		
Intersection Capacity Utilization	80.9%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	55	5	2	101	0	0	0	0	10	33	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	0	61	6	2	112	0	0	0	0	11	37	6
Pedestrians		10			10			10			10	
Lane Width (ft)		12.0			12.0			0.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	122			77			224	201	84	201	203	132
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	122			77			224	201	84	201	203	132
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	99	95	99
cM capacity (veh/h)	1453			1522			690	692	973	742	688	904

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	67	114	53
Volume Left	0	2	11
Volume Right	6	0	6
cSH	1700	1522	717
Volume to Capacity	0.04	0.00	0.07
Queue Length 95th (ft)	0	0	6
Control Delay (s)	0.0	0.2	10.4
Lane LOS		A	B
Approach Delay (s)	0.0	0.2	10.4
Approach LOS			B

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	25.9%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX H

Accident Analysis

Memo

Inner Loop – *Accident History*

Stantec

Date:	December 17, 2008
To:	Bill Holthoff, Stantec
From:	Paula Benway, Stantec

Inner Loop Accident Data

The most recent available accident information was obtained for the section of the inner loop from the Rt. 490 interchange in the east to north of the East Main Street interchange. Information available represents a 39-month period between January 1, 2005 and March 7, 2008. The accident history identified a total of 49 accidents occurred along the Inner Loop in this area. The reportable accidents accounted for 30 (61%) of the total accidents and the non-reportable accidents accounted for 19 (39%) of the total accidents. The following list summarizes the types and number of reportable accidents. The rest of the assessment (analysis, rates and potential corrective action) will be related to the reportable type accidents that occurred in the corridor.

- Fixed Object – 17 (57%)
- Sideswipe – 5 (17%)
- Rear End – 4 (13%)
- Right Angle – 1 (3%)
- Head-on – 1 (3%)
- Unknown – 2 (7%)

The accident severity included 13 injuries (43%) and 17 (57%) property damage only. Fifty three percent of all accidents occurred during evening hours with 55% occurring on dry pavement conditions. Seventy percent of the vehicles involved were traveling in a westerly direction. As indicated above, 57% of the accidents involved collision with fixed objects (guide rail, curbing, abutment, debris). Only four of the 30 accidents occurred at a merge/diverge ramp location, with the majority of accidents occurring main line along the horizontal curve between East Main Street and East Avenue. The accident rate for the corridor was calculated and compared to statewide accident rates for Principal Arterial expressways. The current accident rate is 2.48 accidents per million vehicle miles (acc/mvm) which is below the statewide average of 2.72 acc/mvm.

Collision diagrams, detailed accident history, and rate calculations are attached.

Extended Study Area

An extended study area was also reviewed that included at grade adjacent corridors including: East Main Street, Monroe Avenue/Chestnut, Pitkin Street, Union Street, and a portion of Interstate 490. The following table summarizes the number of reportable accidents and the calculated accident rates for the corridor and intersections for each of these adjacent roadways.

ACCIDENT RATES

Intersection	Number of Accidents	State/County Rate	Actual Rate	
Intersection Rate (excludes midblock accidents)				
East Main Street @ *University/Pitkin*	7	0.26 / 0.46	0.33	ACC/MEV
East Main Street @ *Inner Loop/University*	40	0.26 / 0.46	**0.96**	ACC/MEV
East Main Street @ *Union Street*	23	0.26 / 0.46	**0.83**	ACC/MEV
Pitkin Street @ *East Ave*	8	0.34 / 0.22	**0.44**	ACC/MEV
Pitkin Street @ *Broad Street*	4	0.34 / 0.22	**0.66**	ACC/MEV
Union Street @ *University Ave*	14	0.34 / 0.22	**0.65**	ACC/MEV
Union Street @ *East Ave*	17	0.34 / 0.22	**1.13**	ACC/MEV
Union Street @ *Broad St*	3	0.19 / 0.22	**0.71**	ACC/MEV
Monroe Avenue @ *Inner Loop/ Pitkin St.*	7	0.34 / 0.22	**0.26**	ACC/MEV
Monroe Avenue @ *Howell St.*	5	0.34 / 0.22	**0.34**	ACC/MEV
Monroe Avenue @ *South Union St.*	20	0.34 / 0.22	**1.12**	ACC/MEV
Link Rate				
Inner Loop - 940T *Rt. 490-E. Main St.*	30	2.72	2.48	ACC/MVM
I-490 *W.of River -E. of Clinton*	47	2.72	1.08	ACC/MVM

Locations experiencing above state or county wide accident rates are highlighted in red. Both sections of the expressway system (Inner Loop and I-490) are experiencing accident occurrences below the average rates. Each of the adjacent corridors is further assessed below.

Corridor Breakdown

East Main Street corridor– 80 accidents occurred over a 41-month period from University Avenue in the west to Union Street in the east. There were 27(35%) rear-end accidents, 18(23%) sideswipe, 15(20%) right angle, 6(8%) overtaking, 7(8%) left turn, 2(2%) fixed object, 1 backing, 1 bicycle and 2(2%) unknown accidents that occurred at the three intersections along East Main Street. The severity of these accidents included 15(19%) injuries and 65(81%) property damage only. Seventy four percent of all accidents occurred during daylight hours with 70% occurring on dry pavement conditions. The East Main Street intersections with the Inner Loop/University Avenue and the Union Street intersection are experiencing accident rates above the state/county wide average rates.

Inner Loop/University Intersection – of the 40 accidents that occurred at this intersection, 13(33%) were vehicles sideswiping/overtaking in the left turn lanes on the Inner Loop ramp approach and the University Avenue approach. These accidents are attributable to driver confusion, inattention to turning maneuvers, unsafe lane change or possible narrow lane widths. The other major accident type occurring at this intersection is rear-end accidents 13 (33%) of the total; driver inattention is noted as a contributing factor.

North Union Street Intersection – of the 23 accidents that occurred at this intersection, 8(35%) were vehicles sideswiping/overtaking on the North Union Street northbound approach and the East Main Street westbound approach. These accidents are attributable to driver confusion, inattention to turning maneuvers, unsafe lane changes or possible narrow lane widths. The other major accident type occurring at this intersection is rear-end accidents 8 (35%) of the total; driver inattention is noted as a contributing factor.

Monroe Avenue/Chestnut corridor – 50 accidents occurred over a 41-month period along the section from Chestnut north of Inner Loop to South Union Street intersection to the south. There were 20 (40%) rear-end accidents, 11(22%) right angle, 6(12%) sideswipe, 4(8%) right turn, 3(6%) fixed object, 2(4%) left turn, 1(2%) head on, 1(2%) bicycle, 1(2%) driveway and 1 unknown accident. The severity of these accidents included 66% property damage only, 32% resulted in injuries and one fatality (motorcycle) did occur. Sixty two percent of the accidents occurred during daylight hours, and with 68% occurring on dry pavement conditions. The South Union intersection with Monroe Avenue is experiencing an accident rate above the state/county wide average.

South Union Intersection – of the 20 accidents that occurred at this intersection, 8(40%) were right angle accidents with the South Union approach. These accidents are attributable to driver inattention and visibility constraints. The other major accident type occurring at this intersection is rear-end accidents 7 (35%) of the total; driver inattention is noted as a contributing factor.

Pitkin Street corridor – 12 accidents occurred over a 29-month period. There were 5(42%) rear-end accidents, 3(25%) right angle, 1(8%) right turn, 1(8%) overtaking, 1(8%), pedestrian, 1(8%) unknown accident. Ninety two percent of the accidents involved property damage only, with 58% occurring during daylight hours, and with 58% occurring on dry pavement conditions. The East Avenue and Broad Street intersections with Pitkin Street are experiencing accident rates above the state/county wide average rates. Review of the accidents occurring at either intersection does not show a predominant accident pattern.

Union Street corridor – 61 accidents occurred over a 39-month period. There were 21(34%) right angle, 12(20%) rear-end, 10(16%) left turn, 4(6%) backing up, 3(5%) sideswipe, 3(5%) fixed object, 3(5%) right turn, 3(5%) unknown, 1 driveway and 1 overtaking accident. Eighty four percent of the accidents involved property damage only, and evenly distributed during daylight/evening hours, and with 74% occurred on dry pavement conditions. Further review of the actual reports suggests that the rear end accidents were primarily a result of following too closely. The University Avenue and East Avenue intersections with Union Street are experiencing accident rates above the state/county wide average rates.

University Avenue Intersection – of the 14 accidents that occurred at this intersection, 8(57%) were right angle accidents. These accidents are attributable to driver inattention

and possible visibility constraints.

East Avenue Intersection – of the 17 accidents that occurred at this intersection, 12(71%) were right angle accidents. These accidents are attributable to driver inattention and possible visibility constraints related to bridge railing over the Inner Loop and building on the southeast quadrant.

I-490 corridor – 47 accidents occurred over a 33-month period. The 47 accidents consisted of 18(38%) fixed object accidents, 16(34%) rear-end, 8(17%) overtaking, 3(6%) unknown, 1 head-on and 1 sideswipe accident. The accident severity included 16(34%) injuries and 31(66%) property damage only. Sixty six percent of the accidents occurred during daylight hours, and with 60% occurring on dry pavement conditions. The majority of fixed object accidents involved unsafe travel speeds for the conditions (wet, construction, grade, or curvature of road).

STANTEC CONSULTING SERVICES INC.

Attachments: Accident Rate Calculations, Collision Diagrams, Detailed Accident History

ACCIDENT RATE CALCULATIONS

Project Name: **Inner Loop**
Date: 12/10/2008

Intersection Rate

(excludes midblock accidents)

	# Accidents	x	Per Million Entering Vehicles			=		=		
East Main Street @ ***University Ave/Pitkin***	7	x	1,000,000			=	7000000	=	**0.33**	**ACC/MEV**
	16,950	x	3.4	x	365		21034950		0.26	Statewide Rate
	Vehicles/Day		*# of Years*		*Days/Year*				0.46	County Rate
Inner Loop/University	40	x	1,000,000			=	40000000	=	**0.96**	**ACC/MEV**
	33,450	x	3.4	x	365		41511450		0.26	Statewide Rate
	Vehicles/Day		*# of Years*		*Days/Year*				0.46	County Rate
Union Street	23	x	1,000,000			=	23000000	=	**0.83**	**ACC/MEV**
	22,350	x	3.4	x	365		27736350		0.26	Statewide Rate
	Vehicles/Day		*# of Years*		*Days/Year*				0.46	County Rate
Pitkin Street @ ***East Ave***	8	x	1,000,000			=	8000000	=	**0.44**	**ACC/MEV**
	16,450	x	3	x	365		18012750		0.34	Statewide Rate
	Vehicles/Day		*# of Years*		*Days/Year*				0.22	County Rate
Broad Street	4	x	1,000,000			=	4000000	=	**0.66**	**ACC/MEV**
	5,550	x	3	x	365		6077250		0.34	Statewide Rate
	Vehicles/Day		*# of Years*		*Days/Year*				0.22	County Rate
Union Street @ ***University Ave***	14	x	1,000,000			=	14000000	=	**0.65**	**ACC/MEV**
	19,600	x	3	x	365		21462000		0.34	Statewide Rate
	Vehicles/Day		*# of Years*		*Days/Year*				0.22	County Rate
East Ave	17	x	1,000,000			=	17000000	=	**1.13**	**ACC/MEV**
	13,700	x	3	x	365		15001500		0.34	Statewide Rate
	Vehicles/Day		*# of Years*		*Days/Year*				0.22	County Rate
Broad St	3	x	1,000,000			=	3000000	=	**0.71**	**ACC/MEV**
	3,850	x	3	x	365		4215750		0.19	Statewide Rate
	Vehicles/Day		*# of Years*		*Days/Year*				0.22	County Rate
Monroe Avenue @ ***Inner Loop/ Pitkin St.***	7	x	1,000,000			=	7000000	=	**0.26**	**ACC/MEV**
	21,310	x	3.4	x	365		26445710		0.34	Statewide Rate
	Vehicles/Day		*# of Years*		*Days/Year*				0.22	County Rate
Howell St.	5	x	1,000,000			=	5000000	=	**0.34**	**ACC/MEV**
	11,750	x	3.4	x	365		14581750		0.34	Statewide Rate
	Vehicles/Day		*# of Years*		*Days/Year*				0.22	County Rate
South Union St.	20	x	1,000,000			=	20000000	=	**1.12**	**ACC/MEV**
	14,400	x	3.4	x	365		17870400		0.34	Statewide Rate
	Vehicles/Day		*# of Years*		*Days/Year*				0.46	County Rate

Total Link Rate

(All midblock & intersection accidents)

Inner Loop - 940T
Rt. 490-E. Main St.

# Accidents	x	Per Million Entering Vehicles								
30	x	1,000,000					=	30000000	=	**2.48** **ACC/MVM**
1	x	10,200	x	3.25	x	365		12099750		
Length (miles)		*Vehicles/Day*		*# of Years*		*Days/Year*				2.72 Statewide Rate
										0.00 County Rate

I-490
W.of River -E. of Clinton

# Accidents	x	Per Million Entering Vehicles								
47	x	1,000,000					=	47000000	=	**1.08** **ACC/MVM**
0.5	x	86,970	x	2.75	x	365		43648069		
Length (miles)		*Vehicles/Day*		*# of Years*		*Days/Year*				2.72 Statewide Rate
										0.00 County Rate

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: Inner Loop

County of Monroe

Town of City of Rochester

Street Name: Inner Loop (Rt. 940T)

Route Number:

Location: Inner Loop

Milepost: E. Main St To: I-490

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 1

PERIOD STUDIED

From 1/1/2005

To: 3/7/2008

39 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
6001	6/5/2006	16:15		PDO	1	2	1	1	7,13	Side	V2 STRUCK V1 AT EXIT LANE FOR MONROE AVE. (7) Failure to Yield Right of Way (13) Passing or Lane Usage Improper
6004	12/16/2007	5:43		Inj	4	4	2	1	2,19	FixO	V1 STRUCK GUIDE RAIL,THEN STRUCK GUIDE RAIL WITH LEFT SIDE (2) Alcohol Involvement (19) Unsafe Speed
6005	2/9/2007	0:29		Inj	4	4	4	4	2,66	FixO	V1 SPUN OUT OF CONTROL, HITTING WALL & FLIPPING ONTO IT'S ROOF. (2) Alcohol Involvement (66) Pavement Slippery
6006	3/7/2008	21:30		Inj	4	6	4	4	66	FixO	V1 HIT ICY PATCH ON THE ROAD , SPUN OUT & HIT GUARD RAIL. (66) Pavement Slippery
6009	7/5/2007	1:00		PDO	4	1	1	1	2,13	FixO	V1 LEFT IT'S LANE & STRUCK GUARD RAIL (2) Alcohol Involvement (13) Passing or Lane Usage Improper
6011	6/10/2005	16:05		PDO	1	2	1	1	13	Side	V1 PASS V2, LOST CONTROL STRIKING V2 (13) Passing or Lane Usage Improper
6012	2/8/2006	16:16		Inj	1	1	1	2	9	REnd	Acc. Main St to Acc. E. Ave (9) Following Too Closely
6013	11/16/2006	18:29		PDO	4	5	2	3	66	FixO	Acc. Main St to Acc. E. Ave (66) Pavement Slippery
6016	6/2/2007	12:05		Inj	1	1	1	1	4	RAng	rmp from Main St (4) Driver Inattention
6017	9/22/2006	7:49		PDO	1	5	1	1	19,13	FixO	Acc. Main St to Acc. E. Ave (19) Unsafe Speed (13) Passing or Lane Usage Improper
6018	4/8/2007	14:23		Inj	1	5	1	1	9	REnd	Acc. Main St to Acc. E. Ave (9) Following Too Closely
6019	4/4/2005	22:40		Inj	4	1	1	2	20,19	Side	Acc. Main St to Acc. E. Ave (20) Unsafe Lane Changing (19) Unsafe Speed
6020	10/19/2006	19:00		Inj	4	4	2	3	19,66	FixO	Acc. Main St to Acc. E. Ave (19) Unsafe Speed (66) Pavement Slippery
6021	1/24/2007	1:40		Inj	4	5	2	2	13	FixO	Acc. Main St to Acc. E. Ave (13) Passing or Lane Usage Improper

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: Inner Loop

County of Monroe

Town of City of Rochester

Street Name: Inner Loop (Rt. 940T)

Route Number:

Location: Inner Loop

Milepost: E. Main St To: I-490

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 2

PERIOD STUDIED

From 1/1/2005

To: 3/7/2008

39 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
6022	1/26/2007	23:35		PDO	4	5	4	2	19,66	FixO	Acc. Main St to Acc. E. Ave (19) Unsafe Speed (66) Pavement Slippery
6023	2/15/2007	8:02		PDO	1	5	4	1	19,66	FixO	Acc. Main St to Acc. E. Ave (19) Unsafe Speed (66) Pavement Slippery
6024	2/15/2007	9:45		Inj	1	1	4	1	19,66	REnd	Acc. Main St to Acc. E. Ave (19) Unsafe Speed (66) Pavement Slippery
6025	7/5/2007	0:10		PDO	4	1	1	1	2,13	FixO	Acc. Main St to Acc. E. Ave (2) Alcohol Involvement (13) Passing or Lane Usage Improper
6026	10/19/2006	18:22		PDO	4	1	2	3	19,64	REnd	Main St Ramp (19) Unsafe Speed (64) Obstruction/Debris
6027	1/20/2005	8:04		PDO	1	1	4	4	19,66	FixO	Access E. Ave to Ramp Chapman St. (19) Unsafe Speed (66) Pavement Slippery
6028	2/16/2007	4:30		PDO	4	1	4	4	66	Side	Access E. Ave to Ramp Chapman St. (66) Pavement Slippery
6029	6/10/2005	16:05		PDO	1	1	1	1	13	Side	Access Ramp Chapman St to Access Buena St (13) Passing or Lane Usage Improper
6030	1/1/2005	4:24		Inj	4	1	1	2	2	FixO	Slip Ramp from Pitkin (2) Alcohol Involvement
6032	5/26/2007	11:25		PDO	1	6	1	1	19,47	FixO	Ramp Chapman St to Access Buena St (19) Unsafe Speed (47) Tire Failure/Inadequate
6033	12/20/2006	6:45		PDO	2	1	1	1	64	Unkn	Ramp to Buena St - V1 hit debris in the road (64) Obstruction/Debris
6034	7/27/2007	11:17		PDO	4	5	1	1	2,20	FixO	I-490East Ramp-crashed into attenuator at diverge pt. (2) Alcohol Involvement (20) Unsafe Lane Changing
6038	9/13/2006	22:45	1	PDO	4	1		2	60	Unkn	I-490East Ramp - truck on fire in construction zone (60) Other Vehicular
6039	5/26/2007	11:25	1	PDO	1	6	1	1	19,47	FixO	South overpass - going straight, hit curb, unsafe speed (19) Unsafe Speed (47) Tire Failure/Inadequate

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: Inner Loop

County of Monroe

Town of City of Rochester

Street Name: Inner Loop (Rt. 940T)

Route Number:

Location: Inner Loop

Milepost: E. Main St To: I-490

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 3

PERIOD STUDIED

From 1/1/2005

To: 3/7/2008

39 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
6040	1/5/2008	2:18	2	Inj	4	1	1	2	17,20	H-On	E. Clinton Overpass- wrong way on Inner loop (17) Traffic Control Disregarded (20) Unsafe Lane Changing
6041	1/11/2008	6:31	1	Inj	2	4	2	3	19,66	FixO	W of Clinton overpass - unsafe speed, pavement slippery (19) Unsafe Speed (66) Pavement Slippery

Location: Inner Loop

Town: City of Rochester

13-Jan-09

County: Monroe

Milepost: E. Main St **To:** I-490

Time of Day	No. of Accidents	% of Total
6 AM - 10 AM	6	20
10:00 AM - 4 PM	5	17
4 PM - 7 PM	6	20
7 PM - 12 MID	5	17
12 MID - 6 AM	8	27
Unspecified	0	0
Total	30	

Direction	# Veh	% of Total
North:	0	0
South:	1	2.3
East:	8	19
West:	30	70
Unknown:	0	0

Direction	# Veh	% of Total
NorthEast:	0	0
NorthWest:	1	2.3
SouthEast:	3	7
SouthWest:	0	0
Total	43	

Weather	No. of Accidents	
Clear:	15	50
Cloudy:	7	23
Fog:	0	0
Rain:	4	13
Sleet:	0	0
Snow:	4	13
Unknown:	0	0
Total	30	

Acc. Type	# Veh	% of Total
Sideswipe:	5	17
Rear End:	4	13
Right Angle:	1	3.3
Left Turn:	0	0
Pedestrian:	0	0
Fixed Object:	17	57
Head on:	1	3.3

Acc. Type	# Veh	% of Total
Bicycle:	0	0
Right Turn:	0	0
Driveway:	0	0
Backing:	0	0
Overtaking:	0	0
Unknown:	2	6.7
Total	30	

Pavement	No. of Accidents	
Dry:	16	55
Muddy:	0	0
Other:	0	0
Slush:	0	0
Snow/Ice:	7	24
Wet:	6	21
Unknown:	0	0
Total	29	

Accident Severity	No. of Accidents	% of Total
Fatal:	0	0
Non-Fatal Injury:	13	43
Property damage only:	17	57
Non-reportable:	0	0
Total	30	

Type of Vehicle	No. of Accidents	% of Total
Passenger Cars:	43	98
Commercial Vehicles:	1	2.3
Total	44	

Time of Year	No. of Accidents	
Winter (Dec-Feb)	13	43
Spring (Mar-May)	5	17
Summer (Jun-Aug)	7	23
Fall (Sep-Nov)	5	17
Total	30	

Light Condition	No. of Accidents	% of Total
Dark Road-Lighted:	16	53
Dark Road-Unlighted:	0	0
Dawn:	2	6.7
Daylight:	12	40
Dusk:	0	0
Unknown:	0	0
Total	30	

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: East Main

County of Monroe

Town of City of Rochester

Street Name: East Main St Corridor

Route Number:

Location: East Main St

Milepost: University Ave To: Union Street

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 1

PERIOD STUDIED

From 1/1/2005

To: 5/10/200

41 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
1019	10/2/2005	11:50	2	PDO	1	1	1	1	4,9	REnd	V1 rear-ended v2 while V2 was stopped in traffic. (4) Driver Inattention (9) Following Too Closely
1021	9/19/2006	12:03	2	PDO	1	1	1	1	18,20	Side	Vehicles turning left in adjoining lanes when v1 veered into v2. (18) Turning Improperly (20) Unsafe Lane Changing
1023	5/23/2007	13:40	2	PDO	1	1	1	1	4	Side	V1 sideswiped the parked v2. (4) Driver Inattention
1033	1/3/2006	16:20	2	PDO	1	1	1	2	69,7	RAng	V1 was allowed to enter by v2 stopped vehicles in Lanes 1 & 2 but entering lane 3 struck V2 (69) View Obstructed/Limited (7) Failure to Yield Right of Way
1034	9/9/2005	13:38	2	PDO	1	1	1	1	9	REnd	(9) Following Too Closely
1035	3/28/2006	9:10	2	Inj	1	2	1	1		Left	V2 in intersection when light turned red. V1 started before V2 cleared
1037	3/2/2007	22:50	2	PDO	4	1	1	1	, 18	Left	V2 turned into the path of V1 (18) Turning Improperly
1038	6/2/2007	12:05	2	Inj	1	1	1	1	4	RAng	V1 struck v2. (4) Driver Inattention
1039	4/4/2007	8:06	2	PDO	1	1	2	3	, 18,13	Side	V2 was sideswiped by v1. (18) Turning Improperly (13) Passing or Lane Usage Improper
1040	3/6/2007	22:11	2	PDO	4	1	4	2	, 7	Left	(7) Failure to Yield Right of Way
1041	3/26/2006	13:35	2	PDO	1	1	1	2	17	RAng	(17) Traffic Control Disregarded
1042	6/10/2005	13:33	2	PDO	1	1	2	2	4,20	Side	V1 clipped mirror on V2 while goig around a third unvolved vehicle. (4) Driver Inattention (20) Unsafe Lane Changing
1043	7/6/2005	1:16	2	PDO	1	1	2	3	7,17	RAng	V1 ran red light and struck V2 (7) Failure to Yield Right of Way (17) Traffic Control Disregarded
1044	9/17/2005	15:29	2	PDO	1	1	1	1	, 17	RAng	V1 struck V2 who had failed to stop for the red light. (17) Traffic Control Disregarded

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: East Main

County of Monroe

Town of City of Rochester

Street Name: East Main St Corridor

Route Number:

Location: East Main St

Milepost: University Ave To: Union Street

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 2

PERIOD STUDIED

From 1/1/2005

To: 5/10/200

41 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
1045	9/26/2005	21:52	2	PDO	4	4	1	1	4	Over	(4) Driver Inattention
1046	10/22/2005	20:06	2	Inj	4	1	2	3	, 17	RAng	V2 ran a red light and was struck by V1 (17) Traffic Control Disregarded
1047	10/25/2005	7:35	2	Inj	1	1	2	3	17	RAng	V1 & 2 colided in the intersection and claim both had a green light. (17) Traffic Control Disregarded
1048	12/7/2005	7:45	2	PDO	1	1	2	2	, 26	REnd	V2 stopped quickly to avoid vehicle running a red light and was rearended by V2 (26) Reaction to Other Univolved Vehicle
1049	12/27/2005	17:12	2	PDO	4	1	1	2	3	Back	V1 backed into V2 (3) Backing Unsafely
1050	3/27/2006	13:50	2	PDO	1	1	1	1	4	REnd	(4) Driver Inattention
1051	5/19/2006		3	PDO	1	1	2	3	17	RAng	V1 ran the red light and was struck by v2 and V3. (17) Traffic Control Disregarded
1052	8/12/2006	9:05		PDO	1	1	1	1	4	REnd	(4) Driver Inattention
1054	11/2/2006	12:33	2	Inj	1	1	1	1	17, 17,7	RAng	V1&2 struck each other. Both drivers claimed that they had a green light. (17) Traffic Control Disregarded (17) Traffic Control Disregarded (7) Failure to Yield Right of Way
1055	1/2/2007	16:06	2	PDO	3	4	1	1	18	Side	V1 straight in a left turnlane and struck v2, in a left turnlane (18) Turning Improperly
1056	5/3/2007	23:35	2	PDO	4	1	1	2	2,20	Side	V1 sideswiped V2 and left the scene (2) Alcohol Involvement (20) Unsafe Lane Changing
1057	5/29/2007	18:15	2	PDO	1	1	1		4	REnd	(4) Driver Inattention
1058	6/28/2007	17:15	2	PDO	1	1	1	1	4	REnd	(4) Driver Inattention
1059	7/27/2007	17:16	2	PDO	1	1	1	1	13	Side	Both vehicles were turning left and V2 drifted into v1's lane. (13) Passing or Lane Usage Improper

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: East Main

County of Monroe

Town of City of Rochester

Street Name: East Main St Corridor

Route Number:

Location: East Main St

Milepost: University Ave To: Union Street

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 3

PERIOD STUDIED

From 1/1/2005

To: 5/10/200

41 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
1060	8/29/2007	13:59	2	PDO	1	4	1	1	7,20	Over	V1 U-turn from the right lane and turned infront of V2 (7) Failure to Yield Right of Way (20) Unsafe Lane Changing
1061	4/22/2008	9:00	2	PDO	1	1	1	1	13	Side	V1 struck V2 with its trailer while they were both turning left (13) Passing or Lane Usage Improper
1062	5/6/2008	16:02	2	PDO	1	1	1	2	13	Over	(13) Passing or Lane Usage Improper
1063	5/10/2008	13:34	3	PDO	1	1	1	1	17,4	RAng	V1 tried to make the light and Struck V2&3 (17) Traffic Control Disregarded (4) Driver Inattention
1068	9/8/2006	22:40	2	PDO	4	1	1	2	13	Over	V1 merge to right lane and struck v2 (13) Passing or Lane Usage Improper
1071	7/2/2007	10:32	2	PDO	1	1	1	1	9	REnd	(9) Following Too Closely
1072	7/2/2007	10:32	2	PDO	1	1	1	2	9	REnd	(9) Following Too Closely
1074	11/20/2007	16:30	3	PDO	1	1	1	1	9	REnd	V3 sudden stop causing V2 to stop. V1 hit v2 which caused V2 ot hit V3 (9) Following Too Closely
1075	12/11/2007	13:00	2	PDO	1	1	2	3	9	REnd	(9) Following Too Closely
1076	1/11/2008	10:02	2	PDO	1	1	2	2	26	Side	V1 avoiding another vehicle struck v2 who was the right lane. (26) Reaction to Other Univolved Vehicle
1077	1/21/2008	19:05	2	PDO	4	1	1	2	13	Over	V1 drove by V2 and struck V1's mirror. (13) Passing or Lane Usage Improper
1078	2/9/2008	13:35	2	PDO	1	1	4	2	4,9	REnd	V2 stopped suddenly to let a NYS Trooper by and v1 struck V2 (4) Driver Inattention (9) Following Too Closely
1079	3/7/2008	8:30	3	Inj	1	1	2	2	69, 7,69	Left	V1 struck V2 as it made a left turn causing it to spin out and hit a parked car (69) View Obstructed/Limited (7) Failure to Yield Right of Way (69) View Obstructed/Limited
1081	7/12/2005	8:10	2	PDO	1	1	1	1	7	Left	(7) Failure to Yield Right of Way

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: East Main

County of Monroe

Town of City of Rochester

Street Name: East Main St Corridor

Route Number:

Location: East Main St

Milepost: University Ave To: Union Street

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 4

PERIOD STUDIED

From 1/1/2005

To: 5/10/200

41 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
1082	9/1/2005	16:06	2	PDO	1	1	1	1	45	Unkn	V1's mirror struck V2 (45) Oversized Vehicle
1084	2/1/2006	14:56	2	PDO	1	1	2	2		REnd	V2 stopped and V1 tried to go around it but clipped the back of V2
1091	8/29/2007	19:27	1	PDO	1	1	1	1		FixO	V1 swerved into pole
1093	2/2/2006	1:09	1	PDO	4	1	1	1	2	FixO	(2) Alcohol Involvement
1094	1/17/2007		2	PDO	0	1	1	1		REnd	E. Main St. @ Union St
1095	4/14/2006	21:14	2	Inj	4	1	1	1		Unkn	E. Main St. @ Union St.
1097	1/1/2005	18:32	2	Inj	4	1	1	1	2	RAng	E. Main St. @ Pitkin St (2) Alcohol Involvement
1099	10/25/2005	7:35	2	Inj	1	1	2	3	17,17	RAng	E. Main St. @ Pitkin St (17) Traffic Control Disregarded (17) Traffic Control Disregarded
1100	5/3/2007	23:50		PDO	4	2	1	1	2,9	REnd	V2 stopped at red light, v1 RE v2, then backed up and sideswiped v2 as it passed it (2) Alcohol Involvement (9) Following Too Closely
1101	2/9/2007	13:45		Inj	1	2	2	2	9	REnd	V2 stopped at light, V1 RE V2 following too closely (9) Following Too Closely
1102	2/27/2007	9:20		PDO	1	2	1	1	4	REnd	V2 stopped, V1 lost control, spun around RE v2 (4) Driver Inattention
1103	2/27/2008	9:00		PDO	1	2	4	2	19,66	REnd	V2 stopped, V1 RE V2, unsafe speed, pavement slippery (19) Unsafe Speed (66) Pavement Slippery
1104											Add Accidents under: University Ave + Union St Corridors

Location: East Main St

Town: City of Rochester

12-Jan-09

County: Monroe

Milepost: University Ave **To:** Union Street

Time of Day	No. of Accidents	% of Total
6 AM - 10 AM	11	21
10:00 AM - 4 PM	19	37
4 PM - 7 PM	10	19
7 PM - 12 MID	10	19
12 MID - 6 AM	2	3.8
Unspecified	0	0
Total	52	

Direction	# Veh	% of Total
North:	10	9.3
South:	19	18
East:	21	20
West:	49	46
Unknown:	0	0

Direction	# Veh	% of Total
NorthEast:	1	0.9
NorthWest:	1	0.9
SouthEast:	5	4.7
SouthWest:	1	0.9
Total	107	

Weather	No. of Accidents	
Clear:	29	55
Cloudy:	17	32
Fog:	0	0
Rain:	7	13
Sleet:	0	0
Snow:	0	0
Unknown:	0	0
Total	53	

Acc. Type	# Veh	% of Total
Sideswipe:	9	17
Rear End:	18	33
Right Angle:	12	22
Left Turn:	5	9.3
Pedestrian:	0	0
Fixed Object:	2	3.7
Head on:	0	0

Acc. Type	# Veh	% of Total
Bicycle:	0	0
Right Turn:	0	0
Driveway:	0	0
Backing:	1	1.9
Overtaking:	5	9.3
Unknown:	2	3.7
Total	54	

Pavement	No. of Accidents	
Dry:	38	70
Muddy:	0	0
Other:	0	0
Slush:	0	0
Snow/Ice:	3	5.6
Wet:	13	24
Unknown:	0	0
Total	54	

Accident Severity	No. of Accidents	% of Total
Fatal:	0	0
Non-Fatal Injury:	10	19
Property damage only:	44	81
Non-reportable:	0	0
Total	54	

Type of Vehicle	No. of Accidents	% of Total
Passenger Cars:	108	100
Commercial Vehicles:	0	0
Total	108	

Time of Year	No. of Accidents	
Winter (Dec-Feb)	15	28
Spring (Mar-May)	16	30
Summer (Jun-Aug)	11	20
Fall (Sep-Nov)	12	22
Total	54	

Light Condition	No. of Accidents	% of Total
Dark Road-Lighted:	12	22
Dark Road-Unlighted:	0	0
Dawn:	0	0
Daylight:	40	74
Dusk:	1	1.9
Unknown:	1	1.9
Total	54	

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: University

County of Monroe

Town of City of Rochester

Street Name: University Ave Corridor

Route Number:

Location: University Ave

Milepost: E. Main St To: Union St

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 1

PERIOD STUDIED

From 4/2/2005

To: 4/9/2008

37 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
2002	7/19/2005	13:15		PDO	1	1	1	2	4,20	Side	V1 changed lanes and struck V2 (4) Driver Inattention (20) Unsafe Lane Changing
2003	8/15/2005	12:39		PDO	1	1	1	1	17	REnd	V1 struck V2 after V2 stopped for an emergency vehicle. (17) Traffic Control Disregarded
2004	1/5/2006	13:40		PDO	1	4	2	2	20,13	Over	(20) Unsafe Lane Changing (13) Passing or Lane Usage Improper
2005	1/18/2006	7:57		PDO	1	1	2	2	4	REnd	V1 was cut off and stopped when struck by V2 (4) Driver Inattention
2006	6/21/2006	21:12		PDO	4	1	1	1	7	Over	V1 merged over and struck V2. (7) Failure to Yield Right of Way
2007	7/20/2006	8:49		PDO	1	1	1	1	9	REnd	V2 stopped for pedestrians and V1 rear-ended V 2. (9) Following Too Closely
2008	8/23/2006	14:40		PDO	1	1	1	2	4	Bike	V2 was struck by Bicycle as v2 was turning left (4) Driver Inattention
2009	12/29/2006	23:55		PDO	4	1	1	2	9	REnd	(9) Following Too Closely
2010	2/6/2007	16:13		PDO	1	1	1	2	, 9	REnd	V1 stopped abruptly and V2 rearended it, and V3 rear ended Vehicle 2. (9) Following Too Closely
2011	3/24/2007	18:49		Inj	1	1	2	3	9,4	REnd	(9) Following Too Closely (4) Driver Inattention
2012	4/7/2007	22:20		PDO	4	4	2	4	18,4	Over	V1 in the left lane andwent straight, v2 turned left from middle lane. V1 hit V2 on the left side. (18) Turning Improperly (4) Driver Inattention
2013	7/9/2006	12:01		PDO	1	1	1	1	, 17	RAng	(17) Traffic Control Disregarded
2014	1/13/2007	10:13		Inj	1	1	2	3	4,17	RAng	(4) Driver Inattention (17) Traffic Control Disregarded
2015	3/3/2007	8:20		PDO	1	1	1	1	, 17	RAng	V2 ran red light and struck V1 (17) Traffic Control Disregarded

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: University

County of Monroe

Town of City of Rochester

Street Name: University Ave Corridor

Route Number:

Location: University Ave

Milepost: E. Main St To: Union St

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 2

PERIOD STUDIED

From 4/2/2005

To: 4/9/2008

37 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
2016	10/4/2007	14:48		PDO	1	1	1	1	, 7	Left	(7) Failure to Yield Right of Way
2017	11/3/2007	14:25		Inj	1	1	1	1	, 20,7	RAng	(20) Unsafe Lane Changing (7) Failure to Yield Right of Way
2018	12/18/2007	21:47		PDO	4	1	4	1		RAng	
2019	4/9/2008	17:28		PDO	1	1	1	1	7	RAng	(7) Failure to Yield Right of Way
2020	4/2/2005	22:40		Inj	4	1	1	1		Left	16648 rmp W. Main St. to NY940T E. Main St
2021	4/4/2007	8:00		PDO	1	1	2	3		Over	16648 rmp W. Main St. to NY940T E. Main St
2022											Add Accidents under: E. Main Street + Union St. Corridors

Location: University Ave

Town: City of Rochester

13-Jan-09

County: Monroe

Milepost: E. Main St **To:** Union St

Time of Day	No. of Accidents	% of Total
6 AM - 10 AM	4	20
10:00 AM - 4 PM	8	40
4 PM - 7 PM	3	15
7 PM - 12 MID	5	25
12 MID - 6 AM	0	0
Unspecified	0	0
Total	20	

Direction	# Veh	% of Total
North:	25	63
South:	3	7.5
East:	0	0
West:	9	23
Unknown:	0	0

Direction	# Veh	% of Total
NorthEast:	1	2.5
NorthWest:	1	2.5
SouthEast:	1	2.5
SouthWest:	0	0
Total	40	

Weather	No. of Accidents	
Clear:	10	50
Cloudy:	6	30
Fog:	0	0
Rain:	3	15
Sleet:	0	0
Snow:	1	5
Unknown:	0	0
Total	20	

Acc. Type	# Veh	% of Total
Sideswipe:	1	5
Rear End:	6	30
Right Angle:	6	30
Left Turn:	2	10
Pedestrian:	0	0
Fixed Object:	0	0
Head on:	0	0

Acc. Type	# Veh	% of Total
Bicycle:	1	5
Right Turn:	0	0
Driveway:	0	0
Backing:	0	0
Overtaking:	4	20
Unknown:	0	0
Total	20	

Pavement	No. of Accidents	
Dry:	13	65
Muddy:	0	0
Other:	0	0
Slush:	0	0
Snow/Ice:	1	5
Wet:	6	30
Unknown:	0	0
Total	20	

Accident Severity	No. of Accidents	% of Total
Fatal:	0	0
Non-Fatal Injury:	4	20
Property damage only:	16	80
Non-reportable:	0	0
Total	20	

Type of Vehicle	No. of Accidents	% of Total
Passenger Cars:	41	
Commercial Vehicles:		
Total		

Time of Year	No. of Accidents	
Winter (Dec-Feb)	6	30
Spring (Mar-May)	6	30
Summer (Jun-Aug)	6	30
Fall (Sep-Nov)	2	10
Total	20	

Light Condition	No. of Accidents	% of Total
Dark Road-Lighted:	5	25
Dark Road-Unlighted:	0	0
Dawn:	0	0
Daylight:	15	75
Dusk:	0	0
Unknown:	0	0
Total	20	

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: East Ave/U

County of Monroe

Town of City of Rochester

Street Name: East Ave Corridor

Route Number:

Location: East Ave/Union St

Milepost: To: Union St.

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 1

PERIOD STUDIED

From 9/13/200

To: 4/2/2008

32 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
3011	8/5/2006	2:38		PDO	4	1	1	1	17	Left	(17) Traffic Control Disregarded
3012	7/21/2006	20:01	2	Inj	1	1	1	1		REnd	V1 stopped abruptly rear ended by V2.
3018	9/13/2005	8:06		PDO	1	1	1	1	4,18	Rght	V1 was turning right and turned into V2 (4) Driver Inattention (18) Turning Improperly
3019	9/15/2005	18:03		PDO	1	1	1	1	7,4	Unkn	V3 stopped to let V 1 into traffic, V2 struck V1 making a left (7) Failure to Yield Right of Way (4) Driver Inattention
3020	9/16/2005	22:10		PDO	4	1	1	1		RAng	
3021	10/2/2005	4:00		PDO	4	1	1	1	4	RAng	V1 went the wrong way on N. Union, entered intersection and struck V2 (4) Driver Inattention
3022	1/6/2006	22:45		PDO	4	1	4	4		RAng	
3023	6/3/2006	20:59		Inj	4	1	2	3	64,7	Left	(64) Obstruction/Debris (7) Failure to Yield Right of Way
3024	6/5/2006	11:53		Inj	1	1	1	1		RAng	
3025	6/7/2006	20:10		PDO	1	1	1	1	, 17	RAng	(17) Traffic Control Disregarded
3026	8/24/2006	15:43		PDO	1	1	1	1	17	RAng	(17) Traffic Control Disregarded
3027	8/22/2006	16:21		PDO	1	1	1	2	7	Rght	(7) Failure to Yield Right of Way
3028	11/20/2006	10:15		PDO	1	1	2	2	17	RAng	(17) Traffic Control Disregarded
3029	12/17/2006	20:14		PDO	4	1	2	2	, 17	RAng	(17) Traffic Control Disregarded

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: East Ave/U

County of Monroe

Town of City of Rochester

Street Name: East Ave Corridor

Route Number:

Location: East Ave/Union St

Milepost: To: Union St.

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 2

PERIOD STUDIED

From 9/13/200

To: 4/2/2008

32 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Lght Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
3030	12/23/2006	10:23	6	Inj	1	1	1	2	,17	RAng	V1 hit V2, force V2 over the curb , hit parked V3&4 (17) Traffic Control Disregarded
3031	1/4/2007	11:21		Inj	1	1	1	1	17,7	RAng	V1 & 2 collided and caused V1 to spin out and strike parked V3 & 4. (17) Traffic Control Disregarded (7) Failure to Yield Right of Way
3032	1/12/2007	18:12		PDO	4	1	2	3	, 7,69	RAng	(7) Failure to Yield Right of Way (69) View Obstructed/Limited
3033	5/8/2007	11:51		PDO	1	1	1	1	7,17	RAng	(7) Failure to Yield Right of Way (17) Traffic Control Disregarded
3034	4/2/2008	20:23		PDO	3	1	1	1	7,69	Left	v2 It out of drive, view obstructed by parked veh; was struck by V1 westbound (7) Failure to Yield Right of Way (69) View Obstructed/Limited
3035	11/2/2005	21:57		PDO	4	1	1	1	18	Left	East Ave @ Union St (18) Turning Improperly
3036	4/22/2006	21:57		PDO	4	1	1	1	,17	RAng	East Ave @ Union St (17) Traffic Control Disregarded
3037	6/7/2006	20:10		PDO	1	1	1	1	17	RAng	East Ave @ N. Union St (17) Traffic Control Disregarded
3038											Add acidents found: Pitkin St. corridor

Location: East Ave/Union

Town: City of Rochester

13-Jan-09

County: Monroe

Milepost:

To: Union St.

Time of Day	No. of Accidents	% of Total
6 AM - 10 AM	1	4.5
10:00 AM - 4 PM	6	27
4 PM - 7 PM	3	14
7 PM - 12 MID	10	45
12 MID - 6 AM	2	9.1
Unspecified	0	0
Total	22	

Direction	# Veh	% of Total
North:	17	34
South:	5	10
East:	12	24
West:	14	28
Unknown:	0	0

Direction	# Veh	% of Total
NorthEast:	1	2
NorthWest:	1	2
SouthEast:	0	0
SouthWest:	0	0
Total	50	

Weather	No. of Accidents	
Clear:	15	68
Cloudy:	4	18
Fog:	0	0
Rain:	2	9.1
Sleet:	0	0
Snow:	1	4.5
Unknown:	0	0
Total	22	

Acc. Type	# Veh	% of Total
Sideswipe:	0	0
Rear End:	1	4.5
Right Angle:	14	64
Left Turn:	4	18
Pedestrian:	0	0
Fixed Object:	0	0
Head on:	0	0

Acc. Type	# Veh	% of Total
Bicycle:	0	0
Right Turn:	2	9.1
Driveway:	0	0
Backing:	0	0
Overtaking:	0	0
Unknown:	1	4.5
Total	22	

Pavement	No. of Accidents	
Dry:	17	77
Muddy:	0	0
Other:	0	0
Slush:	0	0
Snow/Ice:	1	4.5
Wet:	4	18
Unknown:	0	0
Total	22	

Accident Severity	No. of Accidents	% of Total
Fatal:	0	0
Non-Fatal Injury:	5	23
Property damage only:	17	77
Non-reportable:	0	0
Total	22	

Type of Vehicle	No. of Accidents	% of Total
Passenger Cars:	50	94
Commercial Vehicles:	3	5.7
Total	53	

Time of Year	No. of Accidents	
Winter (Dec-Feb)	5	23
Spring (Mar-May)	3	14
Summer (Jun-Aug)	8	36
Fall (Sep-Nov)	6	27
Total	22	

Light Condition	No. of Accidents	% of Total
Dark Road-Lighted:	9	41
Dark Road-Unlighted:	0	0
Dawn:	0	0
Daylight:	12	55
Dusk:	1	4.5
Unknown:	0	0
Total	22	

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: Union St.

County of Monroe

Town of City of Rochester

Street Name: Union St. Corridor

Route Number:

Location: Union St.

Milepost: S. Union St To: E. Main St

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 1

PERIOD STUDIED

From 3/17/200

To: 5/31/200

39 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Lght Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
4001	10/28/2006	2:27		PDO	4	1	2	3	20	Over	V1 ENTERED V2'S LANE AND STRUCK V2 (20) Unsafe Lane Changing
4002	7/23/2006	8:48		PDO	1	1	1	2	18	Unkn	V1 TURNED IN FRON OF V2 IN AN ATTEMPT TO TURN INTO A DRIVEWAY (18) Turning Improperly
4004	12/16/2006	0:50		PDO	4	1	1	1	18	Drvy	V1 EXITING LOT STRUCK V2 ENTERING PARKING LOT (18) Turning Improperly
4005	6/13/2006	16:15		PDO	1	1	1	1	4	FixO	V1 STRUCK PARKING SIGN (4) Driver Inattention
4006	6/11/2006	0:00		Inj	4	1	1	1	26	Rght	V1 (MOTORCYCLE) STOPPED TO turn RIGHT INTO PARKING LOT (26) Reaction to Other Univolved Vehicle
4008	5/15/2007	8:10		PDO	1	1	2	2		RAng	V2 STRUCK V1 AS V1 WAS MAKING LEFT TURN
4009	6/12/2007	8:47		PDO	1	1	1	1	7	RAng	V1 FAILED TO STOP FOR RED LIGHT & STRUCK V2 (7) Failure to Yield Right of Way
4010	7/28/2007	2:20		PDO	4	1	1	1	13,17	Left	V2 TURNED LEFT IN FRONT OF V1. V1 STRUCK V2 (13) Passing or Lane Usage Improper (17) Traffic Control Disregarded
4011	11/30/2007	23:45		PDO	4	1	1	2	18,20	Left	V2 TURNED LEFT IN FRONT OF V1, V1 STRUCK V2 (18) Turning Improperly (20) Unsafe Lane Changing
4012	12/1/2007	13:36		PDO	1	1	1	1	7	RAng	V2 RAN RED LIGHT & STRUCK V1. V2 FLED SCENE (7) Failure to Yield Right of Way
4013	4/20/2008	10:54		PDO	1	1	1	2	17	RAng	V1 WENT THRU RED LIGHT & STRUCK V2 (17) Traffic Control Disregarded
4015	10/9/2006	21:00		PDO	4	1	1	2		Back	V1 BACKED INTO V2 WHILE V2 WAS PARKED
4016	11/3/2006	22:34		PDO	4	1	1	2	13	Left	V2 TURN LEFT, V1 STRUCK V2 BOTH IN LEFT LANES (13) Passing or Lane Usage Improper
4018	5/3/2007	17:25		PDO	1	4		1	26	FixO	V1 SWERVED TO AVOID V2, STRUCK CURB (26) Reaction to Other Univolved Vehicle

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: Union St.

County of Monroe

Town of City of Rochester

Street Name: Union St. Corridor

Route Number:

Location: Union St.

Milepost: S. Union St To: E. Main St

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 2

PERIOD STUDIED

From 3/17/200

To: 5/31/200

39 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
4019	5/5/2006	8:45		PDO	1	1	1	1	4	Side	V1 STARTED TO SWITCH LANES & SIDESWIPED V2 (4) Driver Inattention
4021	3/31/2006	11:07		Inj	1	1	1	1	9	REnd	V2 STOPPED & V1 REAR-ENDED V2 (9) Following Too Closely
4022	10/30/2005	1:30		PDO	4	1	1	1	4	Back	V1 WAS PARKED & V2 WAS STOPPED AT CORNER. V1 BACKED INTO V2 (4) Driver Inattention
4023	12/10/2005	17:18		PDO	4	1	1	1	4	REnd	V2 STOPPED & TRAFFIC LIGHT & V1 REAR-ENDED V2 (4) Driver Inattention
4025	5/31/2006	23:50		PDO	4	1	1	2	4	Side	V2 PARKED. V1 TURNED RIGHT INTO THE PARK LOT STRUCK V2 (4) Driver Inattention
4026	1/22/2008	10:52		PDO	1	1	1	2	3	Back	V1 BACKING INTO DRIVEWAY & STRUCK V2 STOPPED IN TRAFFIC (3) Backing Unsafely
4027	10/12/2007	14:32		Inj	1	1	1	1	4	REnd	V1 (RTS BUS) REAR-ENDED V2. (4) Driver Inattention
4028	8/12/2007	2:41		PDO	4	1	1	1	7,17	RAng	V2 STRUCK BY V1 WHICH THEN FLED SCENE (7) Failure to Yield Right of Way (17) Traffic Control Disregarded
4029	2/16/2007	2:25		PDO	4	1	4	4	2,19	Unkn	V1 HIGH RATE OF SPEED, SLID ICY ROAD, CURB (2) Alcohol Involvement (19) Unsafe Speed
4031	5/20/2006	1:02		PDO	4	1	2	3	9,26	REnd	V2 AVOID UNKNOWN VEHICLE, REAR-ENDED BY V1 (9) Following Too Closely (26) Reaction to Other Univolved Vehicle
4032	11/17/2005	0:30		PDO	4	1	1	2	2	FixO	V1 SWERVED OFF ROAD, OVER CURB,STRUCK TREE (2) Alcohol Involvement
4033	4/4/2008	8:40		PDO	1	1	2	3	20,7	Side	V1 CHANGED LANES & struck v2 (20) Unsafe Lane Changing (7) Failure to Yield Right of Way
4035	6/9/2006	14:00		PDO	1	1	1	2	20	Left	V1 WAS CHANGING LANES WHEN IT STRUCK V2 (20) Unsafe Lane Changing
4036	8/26/2005	1:49		PDO	1	1	1	2	2,3	Left	V1 BACKING DOWN STREET INTO V2. (2) Alcohol Involvement (3) Backing Unsafely

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: Union St.

County of Monroe

Town of City of Rochester

Street Name: Union St. Corridor

Route Number:

Location: Union St.

Milepost: S. Union St To: E. Main St

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 3

PERIOD STUDIED

From 3/17/200

To: 5/31/200

39 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
4037	4/29/2006	1:34		PDO	4	1	1	1	2,19	Left	V1 TURNED LEFT, WRONG WAY,ONE WAY ST. SIDESWIPING V2 & V3 (2) Alcohol Involvement (19) Unsafe Speed
4038	3/11/2008	15:43		PDO	1	1	5	1	9	REnd	V2 PARKED WHEN V1 SWERVED V1 REAR-ENDED V2 (9) Following Too Closely
4041	5/31/2008	4:32		PDO	4	4	1	1	5	RAng	v1 VEHICLE WOULD NOT TURN & STRuCK CURB (5) Driver Inexperience
4043	3/31/2006	11:07		Inj	1	1	1	1	9	REnd	V1 EXITED INNER LOOP & STRUCK V2 (9) Following Too Closely
4044	1/2/2006	22:55		PDO	4	1	2	2	2,47	REnd	V1 REAR-ENDED V2 PARKED. (2) Alcohol Involvement (47) Tire Failure/Inadequate
4045	4/5/2008	2:45		PDO	4	1	2	2	9,66	REnd	V1 ATTEMPTED TO STOP & REAR-ENDED V2 (9) Following Too Closely (66) Pavement Slippery
4046	3/15/2008	13:50		PDO	1	1	1	2		RAng	V2 ENTERED INTERSECTION & WAS STRUCK BY V1.
4047	12/12/2007	17:59		PDO	4	1	2	4	26	REnd	V2 STOPPED TO AVOID ANOTHER V & WAS REAR-ENDED BY V1 (26) Reaction to Other Univolved Vehicle
4049	2/22/2008	19:15		PDO	4	1	2	2	4	REnd	V2 STOPPED AT RED LIGHT AND WAS REAR-ENDED BY V1. (4) Driver Inattention
4050	3/17/2005	23:41		PDO	4	1	1	1	2,3	Back	V1 TURNED THE WRONG WAY ONTO ONE-WAY STREET, THEN BACKED UP & STRUCK V2 (2) Alcohol Involvement (3) Backing Unsafely
4051	3/31/2006	11:07		Inj	1	1	1	1	9	REnd	S. Union St @ Grifith St (9) Following Too Closely
4052											Add accidents found: E. Main+ University+East Ave+Broad+Monroe corridors

Location: Union St.

Town: City of Rochester

13-Jan-09

County: Monroe

Milepost: S. Union St **To:** E. Main St

Time of Day	No. of Accidents	% of Total
6 AM - 10 AM	5	13
10:00 AM - 4 PM	10	26
4 PM - 7 PM	4	10
7 PM - 12 MID	7	18
12 MID - 6 AM	13	33
Unspecified	0	0
Total	39	

Direction	# Veh	% of Total
North:	41	56
South:	9	12
East:	6	8.2
West:	6	8.2
Unknown:	0	0

Direction	# Veh	% of Total
NorthEast:	4	5.5
NorthWest:	5	6.8
SouthEast:	2	2.7
SouthWest:	0	0
Total	73	

Weather	No. of Accidents	
Clear:	19	49
Cloudy:	15	38
Fog:	0	0
Rain:	3	7.7
Sleet:	0	0
Snow:	2	5.1
Unknown:	0	0
Total	39	

Acc. Type	# Veh	% of Total
Sideswipe:	3	7.7
Rear End:	11	28
Right Angle:	7	18
Left Turn:	6	15
Pedestrian:	0	0
Fixed Object:	3	7.7
Head on:	0	0

Acc. Type	# Veh	% of Total
Bicycle:	0	0
Right Turn:	1	2.6
Driveway:	1	2.6
Backing:	4	10
Overtaking:	1	2.6
Unknown:	2	5.1
Total	39	

Pavement	No. of Accidents	
Dry:	28	74
Muddy:	0	0
Other:	0	0
Slush:	1	2.6
Snow/Ice:	1	2.6
Wet:	8	21
Unknown:	0	0
Total	38	

Accident Severity	No. of Accidents	% of Total
Fatal:	0	0
Non-Fatal Injury:	5	13
Property damage only:	34	87
Non-reportable:	0	0
Total	39	

Type of Vehicle	No. of Accidents	% of Total
Passenger Cars:	73	
Commercial Vehicles:		
Total		

Time of Year	No. of Accidents	
Winter (Dec-Feb)	8	21
Spring (Mar-May)	16	41
Summer (Jun-Aug)	8	21
Fall (Sep-Nov)	7	18
Total	39	

Light Condition	No. of Accidents	% of Total
Dark Road-Lighted:	21	54
Dark Road-Unlighted:	0	0
Dawn:	0	0
Daylight:	18	46
Dusk:	0	0
Unknown:	0	0
Total	39	

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: Monroe Av

County of Monroe

Town of City of Rochester

Street Name: Monroe Ave Corridor

Route Number:

Location: Monroe Ave

Milepost: Chestnut To: Alexander St.

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 1

PERIOD STUDIED

From 1/4/2005

To: 5/28/200

41 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
5001	5/18/2006	13:44		PDO	1	1	2	2	7	RAng	V1 WENT THRU RED LIGHT & STRUCK V2 (7) Failure to Yield Right of Way
5002	7/8/2006	12:22		PDO	1	1	1	1	9	REnd	V2 STOPPED IN TRAFFIC & WAS REAR-ENDED BY V1 (9) Following Too Closely
5003	11/7/2007	22:45		PDO	4	1	1	2	17	RAng	V1 WENT THRU A RED LIGHT & WAS STRUCK BY V2 (17) Traffic Control Disregarded
5004	5/28/2008	22:59		PDO	4	1	1	1	7,18	RAng	V1 MAKE A WRONG TURN ON A ONE WAY ST. V1 THEN MADE A U-TURN & STRUCK V2 (7) Failure to Yield Right of Way (18) Turning Improperly
5005	6/3/2006	19:52		Inj	1	1	2	2	17	RAng	V2 WENT THRU RED LIGHT & WAS STRUCK BY V1. V2 THEN STRUCK V3 (17) Traffic Control Disregarded
5006	1/4/2005	10:15		PDO	1	1	1	2	4,7	RAng	V2 ATTEMPTED TO MAKE A LEFT TURN & WAS STRUCK BY V1 (4) Driver Inattention (7) Failure to Yield Right of Way
5007	6/22/2006	8:48		PDO	1	1	1	2	4	REnd	V2 STOPPED, V1 LIGHT TURN GREEN & THOUGHT V2 HAD STARTED TO MOVE (4) Driver Inattention
5008	7/28/2006	23:05		Inj	4	1	1	1	4	REnd	V2 STOPPED TO MAKE A LEFT TURN WHEN V1 REAR-ENDED V2 (4) Driver Inattention
5009	7/5/2005	15:00		PDO	1	1	2	2	7	Side	V1 ATTEMPTED TO ENTER TRAFFIC & STRUCK V2 (7) Failure to Yield Right of Way
5010	12/31/2005	19:43		Inj	4	1	1	1	4,7	REnd	V2 STOPPED TO turn LEFT, V1 REAR-ENDED V2 (4) Driver Inattention (7) Failure to Yield Right of Way
5011	9/25/2005	15:21		PDO	1	1	1	1	17,7	RAng	V2 ran A RED LIGHT & STRUCK BY V1 (17) Traffic Control Disregarded (7) Failure to Yield Right of Way
5012	12/22/2005	0:06		PDO	4	1	2	2	18,69	Drvy	V1 EXITED PARKING LOT INTO PATH OF V2 (18) Turning Improperly (69) View Obstructed/Limited
5013	2/24/2006	9:02		PDO	1	1	2	2	7	Rght	V2 TURNED IN FRONT OF V1 & WAS STRUCK BY V1 (7) Failure to Yield Right of Way
5014	6/22/2007	17:51		PDO	1	1	1	1		Rght	V1 TURNED RIGHT & STRUCK PARKEd V2, PUSHING IT INTO V3

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: Monroe Av

County of Monroe

Town of City of Rochester

Street Name: Monroe Ave Corridor

Route Number:

Location: Monroe Ave

Milepost: Chestnut To: Alexander St.

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 2

PERIOD STUDIED

From 1/4/2005

To: 5/28/200

41 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
5015	3/28/2007	17:25		PDO	1	1	1	1	9	REnd	V1 REAR-ENDED V2 (9) Following Too Closely
5016	3/31/2008	14:33		PDO	1	1	1	2	26,26	REnd	V1 REAR-ENDED V2 (26) Reaction to Other Univolved Vehicle (26) Reaction to Other Univolved Vehicle
5017	7/22/2005	16:47		PDO	1	1	1	1	7	Side	V1 PULLED INTO TRAFFIC FROM CURB & STRUCK V2 (7) Failure to Yield Right of Way
5019	9/28/2007	0:15		PDO	4	1	1	1		Side	V2 PARKED , STRUCK BY ANOTHER VEHICLE
5020	4/5/2008			PDO		1			13	Side	V1 (UNKNOWN) SIDESWIPED V2 & V3 AS both PARKED (13) Passing or Lane Usage Improper
5023	3/14/2008	14:08		Inj	1	1	1	2	9,42	REnd	V2 SLOWED FOR TRAFFIC, V1 REAR-ENDED V2. (9) Following Too Closely (42) Brakes Defective
5024	3/14/2008	14:08		Inj	1	1	1	2	9,42	REnd	V2 SLOWED FOR TRAFFIC, V1 REAR-ENDED V2. (9) Following Too Closely (42) Brakes Defective
5025	7/13/2007	2:11		Inj	4	1	2	3	4	Rght	V1 WRONG WAY-ONE WAY ST.,TURNED RIGHT & STRUCK PEDESTRIAN (4) Driver Inattention
5026	6/13/2005	14:36		PDO	1	1	1	1	9	REnd	V2 STOPPED IN TRAFFIC & WAS REAR-ENDED BY V1 (9) Following Too Closely
5028	7/8/2005	2:08		PDO	4	1	1	1	2,13	REnd	V2 PARKED. V1 REAR-ENDED V2, THEN STRUCK SIGN & WALL (2) Alcohol Involvement (13) Passing or Lane Usage Improper
5029	12/21/2005	15:49		Inj	1	1	2	2	9	REnd	V2 STOPPED FOR LIGHT WHEN LIGHT TURNED GREEN, V1 REAR-ENDED V2 (9) Following Too Closely
5031	2/19/2006	1:58		PDO	4	1	2	1		REnd	V2 PARKED. V1 STRUCK V2 & FLED SCENE.
5032	9/27/2005	1:10		PDO	4	1	1	1		FixO	V1 OVER CURB & STRUCK TREE
5033	10/7/2005	13:20		PDO	1	1	2	3	7	Rght	V1 PULLED FROM CURB INTO TRAFFIC & STRUCK V2 (7) Failure to Yield Right of Way

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: Monroe Av

County of Monroe

Town of City of Rochester

Street Name: Monroe Ave Corridor

Route Number:

Location: Monroe Ave

Milepost: Chestnut To: Alexander St.

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 3

PERIOD STUDIED

From 1/4/2005

To: 5/28/200

41 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
5034	2/18/2007	7:30		Inj	1	1	1	1	66	Unkn	V1 SLIDE ON SLIPPERY PAVEMENT & STRUCK GUIDE RAIL. (66) Pavement Slippery
5035	5/25/2007	9:58		Inj	1	1	1	1	7,7	RAng	V1 STRUCK V2 WHICH WAS IN THE INTERSECTION. (7) Failure to Yield Right of Way (7) Failure to Yield Right of Way
5036	4/8/2007	19:06		PDO	1	1	1	2	60,13	Side	V1 STOPPED MAKE A LEFT TURN. V2 PASS V1 ON LEFT. V1 THEN STRUCK V2 (60) Other Vehicular (13) Passing or Lane Usage Improper
5037	8/20/2007	14:13		PDO	1	1	2	3	17	RAng	V2 STOPPED, WHEN LIGHT CHANGED V2 ENTERED INTERSECTION & STRUCK BY V1 (17) Traffic Control Disregarded
5038	8/17/2007	17:26		PDO	1	1	2	3	9,66	REnd	V1 REAR-ENDED V2, PUSHING IT INTO V3 (9) Following Too Closely (66) Pavement Slippery
5040	3/19/2006	2:30		PDO	4	4	1	1	13	FixO	D1 STRUCK THE MEDIAN and sign (13) Passing or Lane Usage Improper
5041	7/3/2006	1:56		Fat	4	4	1	1		FixO	V1 (MOTORCYCLE) LOST CONTROL & HIT CURB, LIGHT POLE
5042	9/5/2006	20:08		Inj	4	1	1	2	17	RAng	V1 WENT THRU A RED LIGHT & STRUCK V2 (17) Traffic Control Disregarded
5044	9/19/2006	10:07		PDO	1	1	1	1	17	RAng	V1 (BUS) ENTERED THE INTERSECTION & STRUCK V2. (17) Traffic Control Disregarded
5047	12/27/2005	17:34		Inj	4	1	1	2	,7	Left	Ref. Mrkr. 31 4303 2042 (7) Failure to Yield Right of Way
5048	10/26/2007	15:54		Inj	1	1	2	3		REnd	Ref. Mrkr. 31 4303 2042
5049	12/3/2007	11:40		Inj	1	1	2	4	4,4	RAng	Ref. Mrkr. 31 4303 2042 (4) Driver Inattention (4) Driver Inattention
5051	3/16/2007	21:20		PDO	4	1	4	4	18,60	REnd	V1 was parallel parking and struck V2, turning improperly, other vehicular (18) Turning Improperly (60) Other Vehicular
5052	5/30/2006	11:22		Inj	1	1	1	1	,14	Bike	Monroe Ave @ Linwood Pl (14) Pedestrian's Error/Confusion

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: Monroe Av

County of Monroe

Town of City of Rochester

Street Name: Monroe Ave Corridor

Route Number:

Location: Monroe Ave

Milepost: Chestnut To: Alexander St.

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 4

PERIOD STUDIED

From 1/4/2005

To: 5/28/200

41 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
5053	5/21/2007	15:00		PDO	1	1	1	1	4,7	REnd	V1 stoped at signal then drove forward and struck V2, inattatention, failure to yield (4) Driver Inattention (7) Failure to Yield Right of Way
5054	11/3/2005	0:15		PDO	4	1	1	1	4	H-On	V1 struck median and sign post, driver inattention (4) Driver Inattention
5055	7/4/2006	23:14		PDO	4	1	1	1	42	REnd	V1 rear ended V2 who was stopped at light. V1 states breaks defective (42) Brakes Defective
5056											Additional Accidents on Union Street summary

Location: Monroe Ave

Town: City of Rochester

13-Jan-09

County: Monroe

Milepost: Chestnut

To: Alexander St.

Time of Day	No. of Accidents	% of Total
6 AM - 10 AM	4	9.1
10:00 AM - 4 PM	17	39
4 PM - 7 PM	5	11
7 PM - 12 MID	9	20
12 MID - 6 AM	9	20
Unspecified	0	0
Total	44	

Direction	# Veh	% of Total
North:	9	11
South:	13	16
East:	39	48
West:	12	15
Unknown:	0	0

Direction	# Veh	% of Total
NorthEast:	2	2.4
NorthWest:	4	4.9
SouthEast:	2	2.4
SouthWest:	1	1.2
Total	82	

Weather	No. of Accidents	
Clear:	22	50
Cloudy:	15	34
Fog:	0	0
Rain:	5	11
Sleet:	0	0
Snow:	2	4.5
Unknown:	0	0
Total	44	

Acc. Type	# Veh	% of Total
Sideswipe:	5	11
Rear End:	17	38
Right Angle:	11	24
Left Turn:	1	2.2
Pedestrian:	0	0
Fixed Object:	3	6.7
Head on:	1	2.2

Acc. Type	# Veh	% of Total
Bicycle:	1	2.2
Right Turn:	4	8.9
Driveway:	1	2.2
Backing:	0	0
Overtaking:	0	0
Unknown:	1	2.2
Total	45	

Pavement	No. of Accidents	
Dry:	30	68
Muddy:	0	0
Other:	0	0
Slush:	0	0
Snow/Ice:	1	2.3
Wet:	13	30
Unknown:	0	0
Total	44	

Accident Severity	No. of Accidents	% of Total
Fatal:	1	2.2
Non-Fatal Injury:	14	31
Property damage only:	30	67
Non-reportable:	0	0
Total	45	

Type of Vehicle	No. of Accidents	% of Total
Passenger Cars:	87	
Commercial Vehicles:		
Total		

Time of Year	No. of Accidents	
Winter (Dec-Feb)	9	20
Spring (Mar-May)	13	29
Summer (Jun-Aug)	14	31
Fall (Sep-Nov)	9	20
Total	45	

Light Condition	No. of Accidents	% of Total
Dark Road-Lighted:	17	39
Dark Road-Unlighted:	0	0
Dawn:	0	0
Daylight:	27	61
Dusk:	0	0
Unknown:	0	0
Total	44	

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: East Broad

County of Monroe

Town of City of Rochester

Street Name: E. Broad St Corridor

Route Number:

Location: East Broad St

Milepost: Savanah St To: Union St

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 1

PERIOD STUDIED

From 10/23/20

To: 5/23/200

32 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Light Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
7004	5/4/2007	4:05		PDO	4	1	1	1	17	FixO	V1 TURNED LEFT & DROVE OVER MEDIAN & SIGN. (17) Traffic Control Disregarded
7005	11/4/2006	23:39		PDO	4	1	1	1	13	FixO	V1 FAILED TO STOP AT STOP SIGN, WENT ACROSS INTERSECTION & HIT THE FIRE HYDRANT (13) Passing or Lane Usage Improper
7006	10/23/2005	14:05		PDO	1	1	2	3	4,20	Side	V1 SIDESWIPED V2. V2 DROVE OVER MEDIAN & OVER A STREET SIGN (4) Driver Inattention (20) Unsafe Lane Changing
7007	2/19/2006	2:55		PDO	4	1	4	1	66	Unkn	V1 SLID ON BLACK ICE INTO CURB (66) Pavement Slippery
7008	10/15/2007	14:05		PDO	1	1	1	1	17, 17	RAng	(17) Traffic Control Disregarded (17) Traffic Control Disregarded
7009	5/23/2008	12:40		PDO	1	1	1	1	17,13	Left	V1 making left out of lot went wrong way down browd st hit v2 going EB (17) Traffic Control Disregarded (13) Passing or Lane Usage Improper
7010											Add accidents found: Pitkin St + Union St Corridors

Location: East Broad St

Town: City of Rochester

13-Jan-09

County: Monroe

Milepost: Savanah St **To:** Union St

Time of Day	No. of Accidents	% of Total
6 AM - 10 AM	0	0
10:00 AM - 4 PM	3	50
4 PM - 7 PM	0	0
7 PM - 12 MID	1	17
12 MID - 6 AM	2	33
Unspecified	0	0
Total	6	

Direction	# Veh	% of Total
North:	1	11
South:	1	11
East:	5	56
West:	2	22
Unknown:	0	0

Direction	# Veh	% of Total
NorthEast:	0	0
NorthWest:	0	0
SouthEast:	0	0
SouthWest:	0	0
Total	9	

Weather	No. of Accidents	
Clear:	5	83
Cloudy:	0	0
Fog:	0	0
Rain:	1	17
Sleet:	0	0
Snow:	0	0
Unknown:	0	0
Total	6	

Acc. Type	# Veh	% of Total
Sideswipe:	1	17
Rear End:	0	0
Right Angle:	1	17
Left Turn:	1	17
Pedestrian:	0	0
Fixed Object:	2	33
Head on:	0	0

Acc. Type	# Veh	% of Total
Bicycle:	0	0
Right Turn:	0	0
Driveway:	0	0
Backing:	0	0
Overtaking:	0	0
Unknown:	1	17
Total	6	

Pavement	No. of Accidents	
Dry:	4	67
Muddy:	0	0
Other:	0	0
Slush:	0	0
Snow/Ice:	1	17
Wet:	1	17
Unknown:	0	0
Total	6	

Accident Severity	No. of Accidents	% of Total
Fatal:	0	0
Non-Fatal Injury:	0	0
Property damage only:	6	100
Non-reportable:	0	0
Total	6	

Type of Vehicle	No. of Accidents	% of Total
Passenger Cars:	9	
Commercial Vehicles:		
Total		

Time of Year	No. of Accidents	
Winter (Dec-Feb)	1	17
Spring (Mar-May)	2	33
Summer (Jun-Aug)	0	0
Fall (Sep-Nov)	3	50
Total	6	

Light Condition	No. of Accidents	% of Total
Dark Road-Lighted:	3	50
Dark Road-Unlighted:	0	0
Dawn:	0	0
Daylight:	3	50
Dusk:	0	0
Unknown:	0	0
Total	6	

DETAILS OF ACCIDENT HISTORY

Sear-Brown Group

Diagram: Pitkin St

County of Monroe

Town of City of Rochester

Street Name: Pitkin St

Route Number:

Location: Pitkin St

Milepost: E. Main St To: Chestnut/Mon

Date of Report: 1/13/200

P.I.N. _____

Case No. _____

File _____

By _____

Page Number 1

PERIOD STUDIED

From 10/23/20

To: 5/23/200

32 Months

(1) No.	(2) Date	(3) Time	(4) Vehicles	(5) Severity	(6) Lght Cond	(7) Road Cond	(8) Surf Cond	(9) Weather	(10) Apparent Contributing Factors	(11) Acc. Type	(12) Description
7004	5/4/2007	4:05		PDO	4	1	1	1	17	FixO	V1 TURNED LEFT & DROVE OVER MEDIAN & SIGN. (17) Traffic Control Disregarded
7005	11/4/2006	23:39		PDO	4	1	1	1	13	FixO	V1 FAILED TO STOP AT STOP SIGN, WENT ACROSS INTERSECTION & HIT THE FIRE HYDRANT (13) Passing or Lane Usage Improper
7006	10/23/2005	14:05		PDO	1	1	2	3	4,20	Side	V1 SIDESWIPED V2. V2 DROVE OVER MEDIAN & OVER A STREET SIGN (4) Driver Inattention (20) Unsafe Lane Changing
7007	2/19/2006	2:55		PDO	4	1	4	1	66	Unkn	V1 SLID ON BLACK ICE INTO CURB (66) Pavement Slippery
7008	10/15/2007	14:05		PDO	1	1	1	1	17, 17	RAng	(17) Traffic Control Disregarded (17) Traffic Control Disregarded
7009	5/23/2008	12:40		PDO	1	1	1	1	17,13	Left	V1 making left out of lot went wrong way down browd st hit v2 going EB (17) Traffic Control Disregarded (13) Passing or Lane Usage Improper
7010											Add accidents found: Pitkin St + Union St Corridors

Location: Pitkin St

Town: City of Rochester

13-Jan-09

County: Monroe

Milepost: E. Main St

To: Chestnut/Monro

Time of Day	No. of Accidents	% of Total
6 AM - 10 AM	2	17
10:00 AM - 4 PM	5	42
4 PM - 7 PM	1	8.3
7 PM - 12 MID	3	25
12 MID - 6 AM	1	8.3
Unspecified	0	0
Total	12	

Direction	# Veh	% of Total
North:	0	0
South:	10	43
East:	3	13
West:	9	39
Unknown:	0	0

Direction	# Veh	% of Total
NorthEast:	0	0
NorthWest:	0	0
SouthEast:	0	0
SouthWest:	1	4.3
Total	23	

Weather	No. of Accidents	
Clear:	5	42
Cloudy:	3	25
Fog:	0	0
Rain:	2	17
Sleet:	0	0
Snow:	2	17
Unknown:	0	0
Total	12	

Acc. Type	# Veh	% of Total
Sideswipe:	0	0
Rear End:	5	42
Right Angle:	3	25
Left Turn:	0	0
Pedestrian:	1	8.3
Fixed Object:	0	0
Head on:	0	0

Acc. Type	# Veh	% of Total
Bicycle:	0	0
Right Turn:	1	8.3
Driveway:	0	0
Backing:	0	0
Overtaking:	1	8.3
Unknown:	1	8.3
Total	12	

Pavement	No. of Accidents	
Dry:	7	58
Muddy:	0	0
Other:	0	0
Slush:	0	0
Snow/Ice:	2	17
Wet:	3	25
Unknown:	0	0
Total	12	

Accident Severity	No. of Accidents	% of Total
Fatal:	0	0
Non-Fatal Injury:	1	8.3
Property damage only:	11	92
Non-reportable:	0	0
Total	12	

Type of Vehicle	No. of Accidents	% of Total
Passenger Cars:	23	
Commercial Vehicles:		
Total		

Time of Year	No. of Accidents	
Winter (Dec-Feb)	4	33
Spring (Mar-May)	4	33
Summer (Jun-Aug)	2	17
Fall (Sep-Nov)	2	17
Total	12	

Light Condition	No. of Accidents	% of Total
Dark Road-Lighted:	5	42
Dark Road-Unlighted:	0	0
Dawn:	0	0
Daylight:	7	58
Dusk:	0	0
Unknown:	0	0
Total	12	

ACCIDENT SYMBOLS LEGEND

	V	VEHICLE		FI	FATAL INJURY		FO	FIXED OBJECT
	MV	MOVING VEHICLE	-P-	P	PEDESTRIAN		SP	SIGN POST
	BV	BACKING VEHICLE	-B-	B	BICYCLE		TR	TREE
	PV	PARKED VEHICLE	-M-	M	MOTORCYCLE		UP	UTILITY POLE
	SV	STOPPED VEHICLE	-D-	D	DEER		GR	GUIDE RAIL
	NFI	NON-FATAL INJURY	-BB-	BB	BLACK BEAR		CB	CONCRETE BARRIER

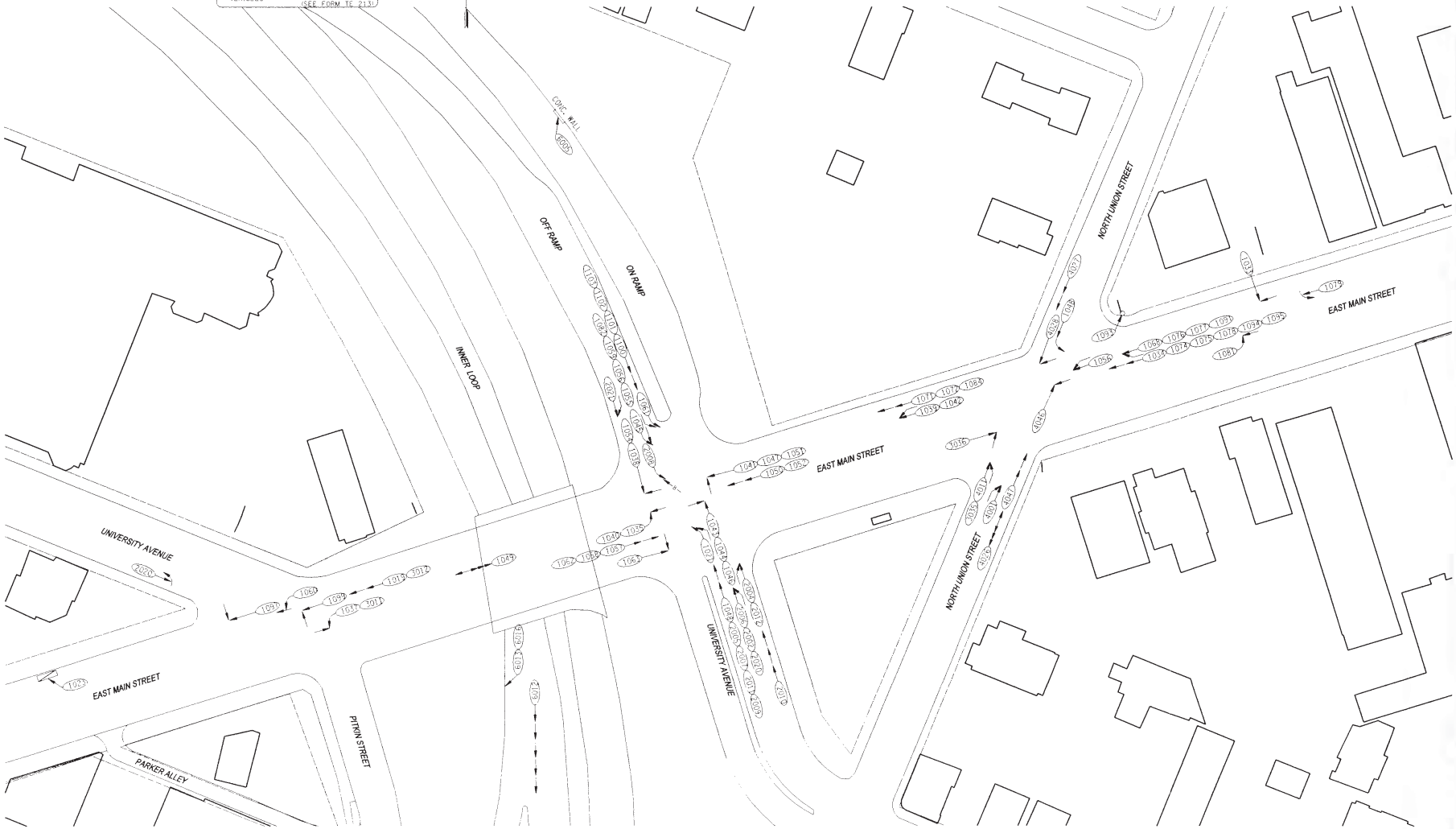
RT	LT	LT5	RANG	SS	HOSS
RT1	LT1	LT6	VFO	SKID	RE
RT2	LT2	OOC	VSP	VGR	DSS
RT3	LT3	OT	VTR	VUP	VCB
RT4	LT4	HO			

ACCIDENT DETAIL

TYPE OF ACCIDENT (SEE LEGEND)

NUMBER OF VEHICLES

NUMBER OF ACCIDENTS (SEE FORM TE 213)



PROJECT ENGINEER	K. STETTNER
PROJECT MANAGER	J. HOFMANN
DRAWN BY	
SCALE	
PRINT DATE	7/18/2008

6		
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0	REVISIONS	DATE

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2253 Brighton-Henrietta Tl. RD
Rochester, N.Y. 14623-2708
Tel (585) 475-1440
Fax (585) 427-9124
www.stantec.com

Project: INNER LOOP IMPROVEMENT PROJECT SCIO STREET TO CLINTON AVENUE
CITY OF ROCHESTER, NEW YORK

Title (as shown): ACCIDENT COLLISION DIAGRAM PLAN

PROJECT NO. 192500170

DRAWING NO. 1

SHEET 1 OF 9

ANSI D - 22" X 34"

ACCIDENT SYMBOLS LEGEND

	V	VEHICLE		FI	FATAL INJURY		FO	FIXED OBJECT
	MV	MOVING VEHICLE	-P-	P	PEDESTRIAN		SP	SIGN POST
	BV	BACKING VEHICLE	-B-	B	BICYCLE		TR	TREE
	PV	PARKED VEHICLE	-M-	M	MOTORCYCLE		UP	UTILITY POLE
	SV	STOPPED VEHICLE	-D-	D	DEER		GR	GUIDE RAIL
	NFI	NON-FATAL INJURY	-BB-	BB	BLACK BEAR		CB	CONCRETE BARRIER

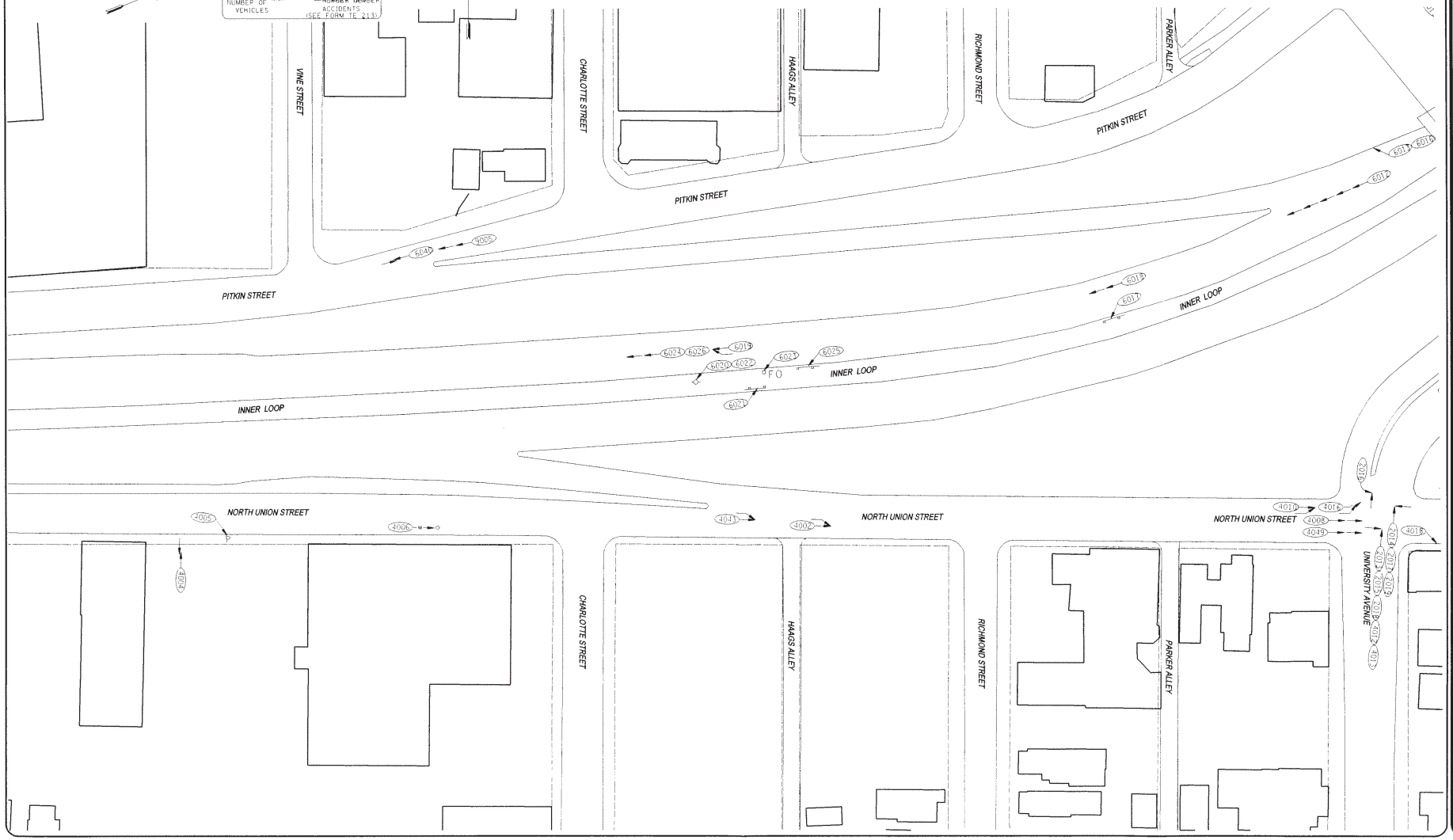
RT	LT	LT5	RANG	SS	HOSS
RT1	LT1	LT6	VFO	SKID	RE
RT2	LT2	OOC	VSP	VGR	DSS
RT3	LT3	OT	VTR	VUP	VCB
RT4	LT4	HO			

ACCIDENT DETAIL

TYPE OF ACCIDENT (SEE LEGEND)

NUMBER OF VEHICLES

ROBBER DEMBER ACCIDENTS (SEE FORM TE 213)



	DATE	BY
6		
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0	REVISIONS	

PROJECT ENGINEER/ARCHITECT: K. STETTNER

PROJECT MANAGER: J. HOFMANN

DRAWN BY: T. SCHNUTZE

FIRST ISSUE DATE: 10/31/2008

SCALE: 1"=40'

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PROJECT: INNER LOOP IMPROVEMENT PROJECT SCIO STREET TO CLINTON AVENUE CITY OF ROCHESTER, NEW YORK

TITLE OF DRAWING: ACCIDENT COLLISION DIAGRAM PLAN

PROJECT NO. 192500170

DRAWING NO. 2

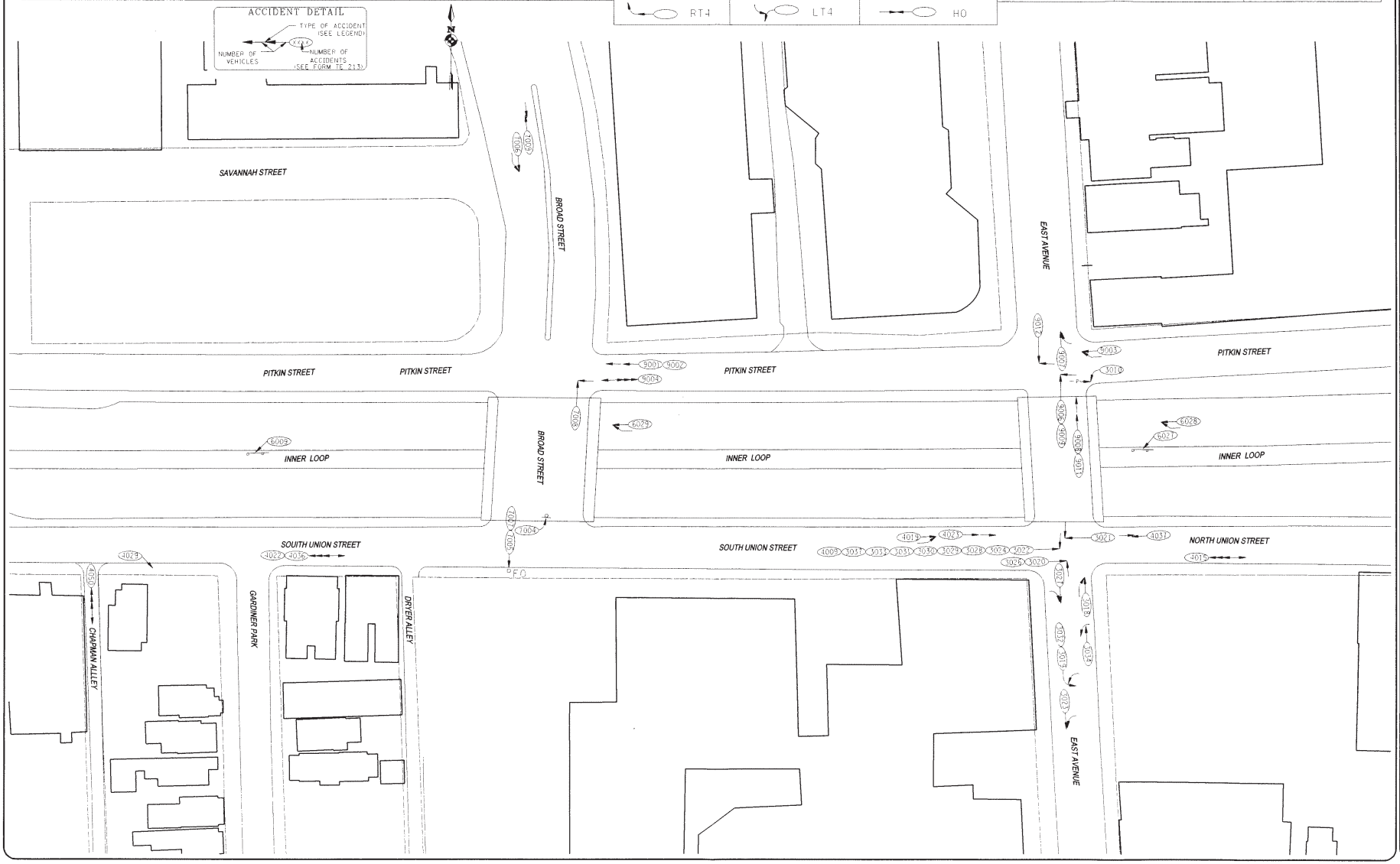
SHEET 2 OF 9

ANSI D - 22" X 34"

ACCIDENT SYMBOLS LEGEND

	V	VEHICLE		FI	FATAL INJURY		FO	FIXED OBJECT
	MV	MOVING VEHICLE	-P-	P	PEDESTRIAN		SP	SIGN POST
	BV	BACKING VEHICLE	-B-	B	BICYCLE		TR	TREE
	PV	PARKED VEHICLE	-M-	M	MOTORCYCLE		UP	UTILITY POLE
	SV	STOPPED VEHICLE	-D-	D	DEER		GR	GUIDE RAIL
	NFI	NON-FATAL INJURY	-BB-	BB	BLACK BEAR		CB	CONCRETE BARRIER

RT	LT	LT5	RANG	SS	HOSS
RT1	LT1	LT6	VFO	SKID	RE
RT2	LT2	OOC	VSP	VGR	DSS
RT3	LT3	OT	VTR	VUP	VCB
RT4	LT4	HO			



NO.	REVISIONS	DATE	BY
6			
5			
4			
3			
2			
1			
0			

PROJECT ENGINEER/ARCHITECT: K. STETTNER
PROJECT MANAGER: J. HOFMANN
DRAWN BY:
SCALE:
PRS1 ISSUE DATE: 7/18/2008

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PROJECT: INNER LOOP IMPROVEMENT PROJECT
SCIO STREET TO CLINTON AVENUE
CITY OF ROCHESTER, NEW YORK

TITLE OF DRAWING: ACCIDENT COLLISION DIAGRAM PLAN

PROJECT NO. 192500170

DRAWING NO. 3

SHEET 3 OF 9

ANSI D - 22" X 34"

ACCIDENT SYMBOLS LEGEND

	V	VEHICLE		FI	FATAL INJURY		FO	FIXED OBJECT
	MV	MOVING VEHICLE	-P-	P	PEDESTRIAN		SP	SIGN POST
	BV	BACKING VEHICLE	-B-	B	BICYCLE		TR	TREE
	PV	PARKED VEHICLE	-M-	M	MOTORCYCLE		UP	UTILITY POLE
	SV	STOPPED VEHICLE	-D-	D	DEER		GR	GUIDE RAIL
	NFI	NON-FATAL INJURY	-BB-	BB	BLACK BEAR		CB	CONCRETE BARRIER

RT	LT	LT5	RANG	SS	HOSS
RT1	LT1	LT6	VFO	SKID	RE
RT2	LT2	OOC	VSP	VGR	DSS
RT3	LT3	OT	VTR	VUP	VCB
RT4	LT4	HO			

ACCIDENT DETAIL

TYPE OF ACCIDENT (SEE LEGEND)

NUMBER OF VEHICLES

NUMBER OF ACCIDENTS (SEE FORM TC-213)

N

6			
5			
4			
3			
2			
1			
0	REVISIONS	DATE	BY

PROJECT ENGINEER/ARCHITECT
K. STETTNER

PROJECT MANAGER
J. HOFMANN

DRAWN BY

SCALE

FIRST ISSUE DATE
7/18/2008

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PROJECT
INNER LOOP IMPROVEMENT PROJECT
SOID STREET TO CLINTON AVENUE
CITY OF ROCHESTER, NEW YORK

TITLE OF DRAWING
ACCIDENT COLLISION DIAGRAM PLAN

PROJECT NO.
192500170

DRAWING NO.
4

SHEET 4 OF 9

Workspace:
Discipline: Traffic
Project NY: Highway_Design_Engl
Node: PFEIBMAN-SP2

Plotted By: bmcnair
Plotted By (Internet):
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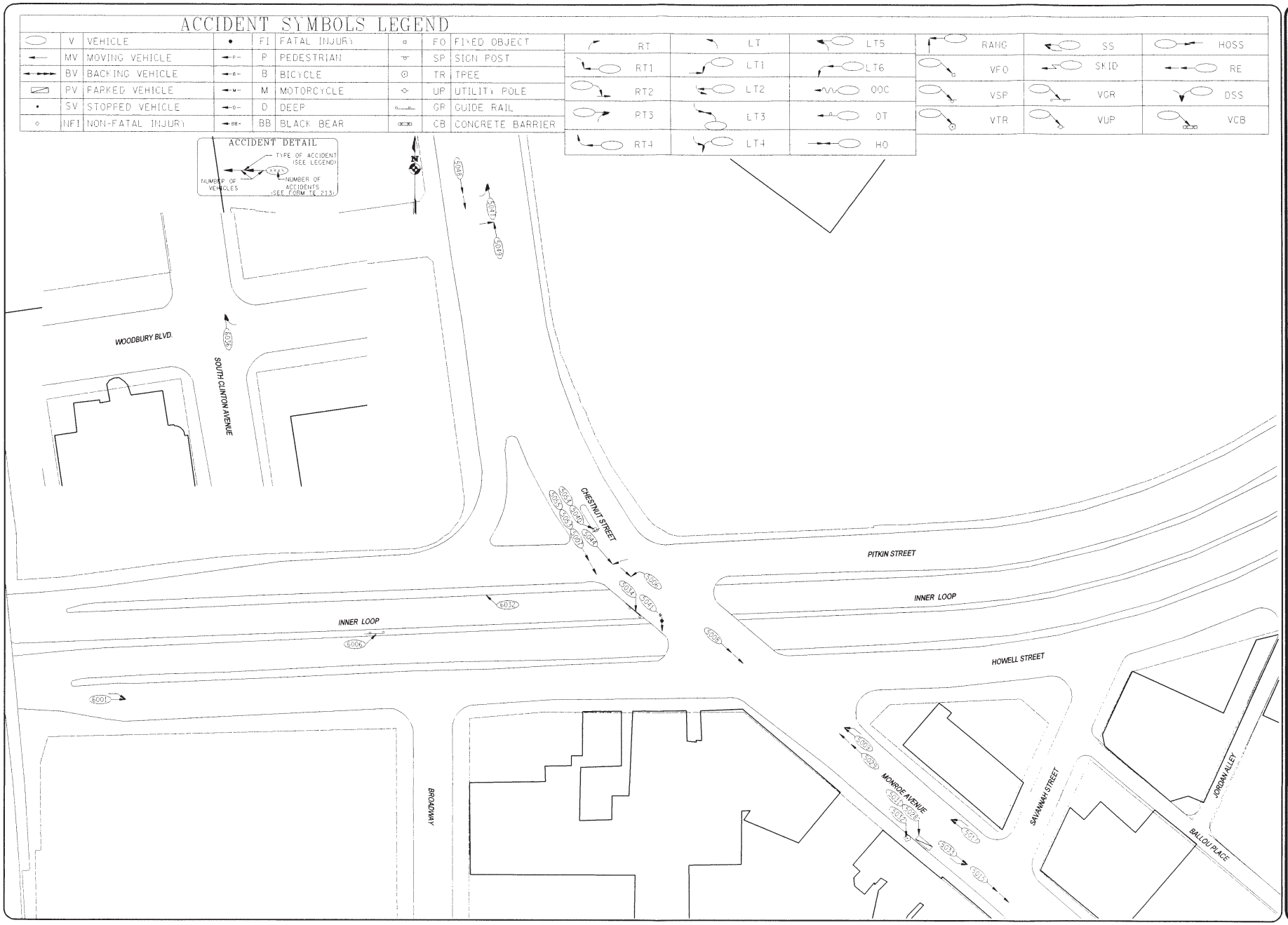
Plotted: 7/17/2008
Time: 1:29:30 PM

ANSI D - 22" X 34"



PROJECT ENGINEER/ARCHITECT
K. STETTNER
PROJECT MANAGER
J. HOFMANN
DRAWN BY
SCALE
FIRST ISSUE DATE
7/12/2006

6		
5		
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1		
0	REVISIONS	
	DATE	BY

STANTEC CONSULTING SERVICES, INC.
2250 Brighton Henrietta Tl. RD
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Tel.(585) 475-1440
Fax.(585) 427-9124
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PROJECT
INNER LOOP IMPROVEMENT PROJECT
S/O STREET TO CLINTON AVENUE
CITY OF ROCHESTER, NEW YORK

TITLE OF DRAWING
ACCIDENT COLLISION DIAGRAM PLAN

PROJECT NO.
192500170

DRAWING NO.
5

SHEET 5 OF 9

Workspace:
Design Model
Project: NY_Highway_Design_Engl
Node: PREMANA-SP2

Plotting Variables
Plotted By: jhofmann
Design File: U:\192500170\transportation\preliminary\Highway\Accident Sheets\Sheet 5_accident
Plotted: 7/12/2006
Time: 9:26:41 PM

ANSI D - 22" X 34"

STANTEC CONSULTING SERVICES, INC.
2350 Brighton Henrietta TL RD
Rochester, NY 14623-2706
Tel.(585) 475-1440
Fax (585) 427-0154
www.stantec.com

PROJECT: INNER LOOP IMPROVEMENT PROJECT
SC/O STREET TO CLINTON AVENUE
CITY OF ROCHESTER, NEW YORK

TITLE OF DRAWING: ACCIDENT COLLISION DIAGRAM PLAN

PROJECT NO. 192500170

DRAWING NO. 6

SHEET 6 OF 9

PROJECT ENGINEER/ARCHITECT: K. STEITNER
PROJECT MANAGER: J. HORMANN
DRAWN BY:
DATE: 7/15/2008

6			
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0	192500170	07/15/2008	RP

Plotting Parameters
Plotted By: Peter Reisman
Design File: U:\192500170\transportation\preliminary\drawing\Accident Sheets\Sheet 6_accident.dgn
Plotted: 11/12/2008
Time: 1:32:34 PM

Workspace:
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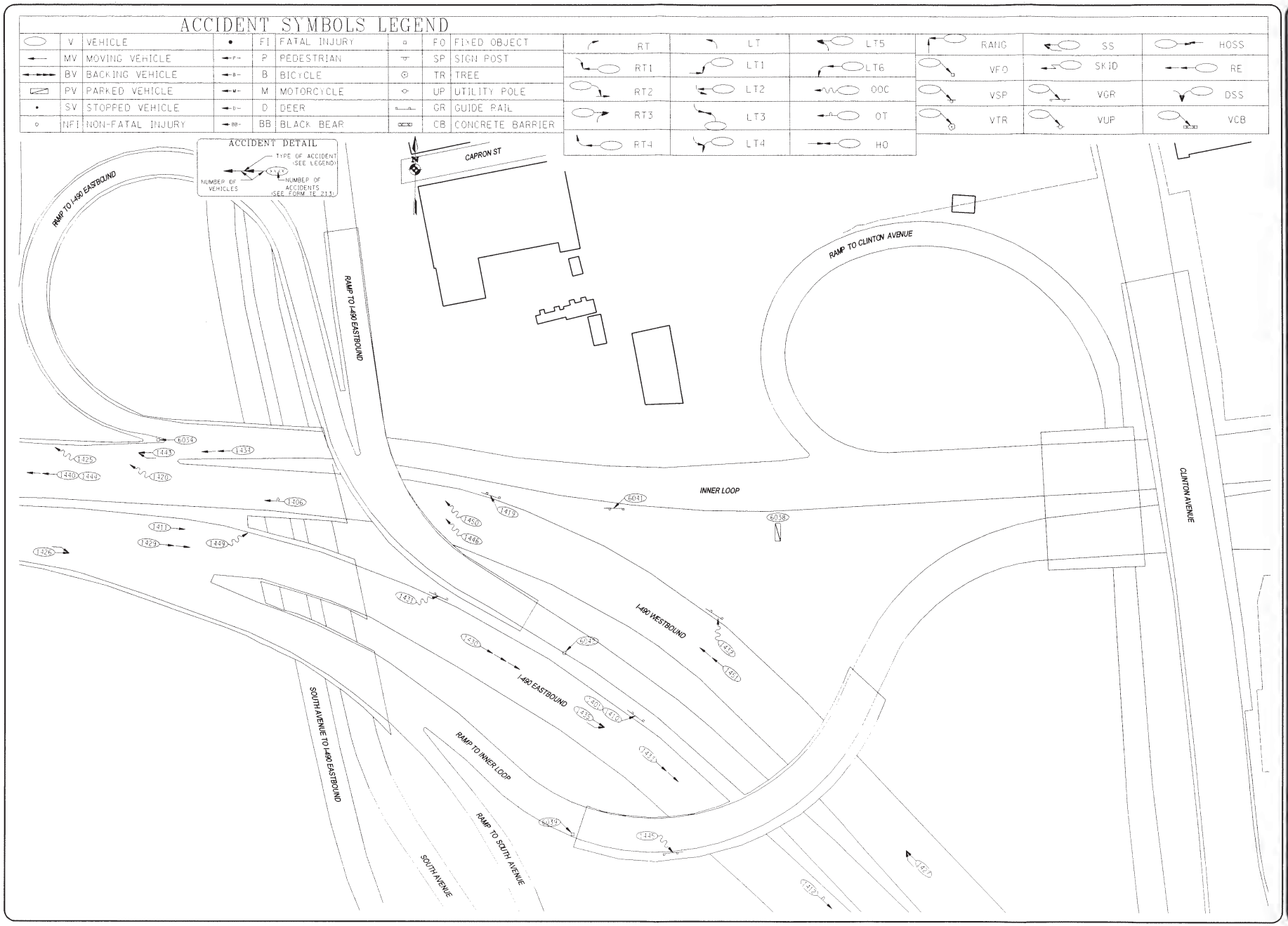
Project: NY_Highway_Design_Engl
Node: FREEMAN-SP2

ANSI D - 22" X 34"



PROJECT ENGINEER (ADMINISTRATOR) K. STETTNER	PROJECT MANAGER J. HOFMANN	DRAWN BY	CHKD
FIRST DRAWN ON 11/15/2006			

STANTEC CONSULTING SERVICES, INC.
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PROJECT: INNER LOOP IMPROVEMENT PROJECT S/O STREET TO CLINTON AVENUE
CITY OF ROCHESTER, NEW YORK

TITLE (as shown): ACCIDENT COLLISION DIAGRAM PLAN

PROJECT NO. 192500170

DRAWING NO. 7

SHEET 7 OF 9

6	5	4	3	2	1
REVISIONS					DATE BY

Workspace: Discipline: Project: NY_Highway_Design_Engl Node: FREEMAN-SP2

Project Information: Project By: jfreeman Design File: U:\192500170\transportation\preliminary\drawing\Accident Sheets\Sheet 7_accident Plotted: 11/15/2006 Time: 11:36:06 PM

ANSI D - 22" X 34"

ACCIDENT SYMBOLS LEGEND

	V	VEHICLE		FI	FATAL INJURY		FO	FIXED OBJECT
	MV	MOVING VEHICLE	-P-	P	PEDESTRIAN		SP	SIGN POST
	BV	BACKING VEHICLE	-B-	B	BICYCLE		TR	TREE
	PV	PARKED VEHICLE	-M-	M	MOTORCYCLE		UP	UTILITY POLE
	SV	STOPPED VEHICLE	-D-	D	DEER		GR	GUIDE RAIL
	NFI	NON-FATAL INJURY	-BB-	BB	BLACK BEAR		CB	CONCRETE BARRIER

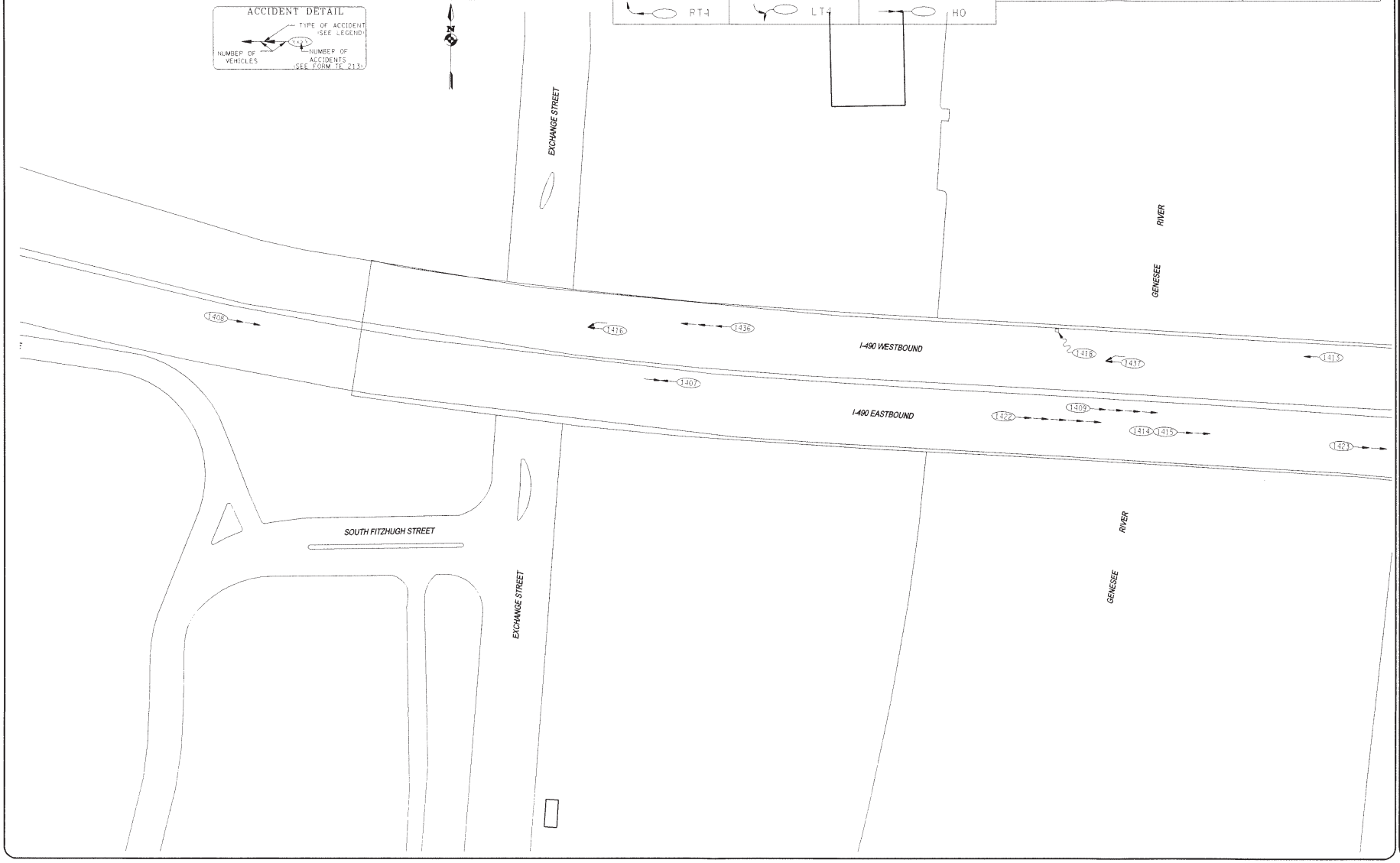
RT	LT	LT5	RANG	SS	HOSS
RT1	LT1	LT6	VFO	SKID	RE
RT2	LT2	OOC	VSP	VGR	DSS
RT3	LT3	OT	VTR	VUP	VCB
RT4	LT4	HO			

ACCIDENT DETAIL

TYPE OF ACCIDENT (SEE LEGEND)

NUMBER OF VEHICLES

NUMBER OF ACCIDENTS (SEE FORM TE 213)



8		
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0	REVISIONS	DATE / BY

PROJECT ENGINEER/ARCHITECT: K. STETTNER

PROJECT MANAGER: J. HOFMANN

DRAWN BY

SCALE

FIRST ISSUE DATE: 7/18/2008

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PROJECT: INNER LOOP IMPROVEMENT PROJECT SCIO STREET TO CLINTON AVENUE CITY OF ROCHESTER, NEW YORK

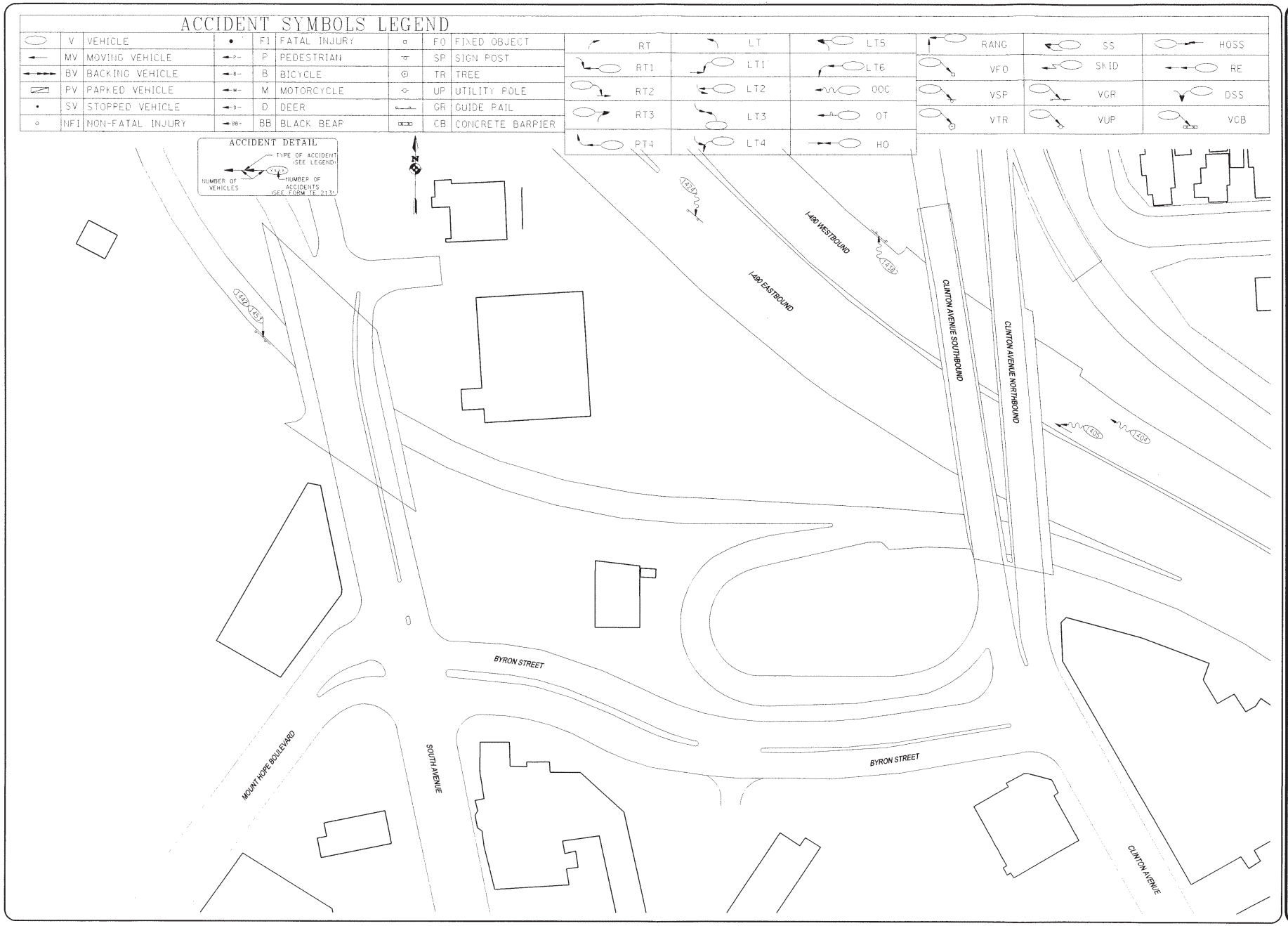
TITLE OF DRAWING: ACCIDENT COLLISION DIAGRAM PLAN

PROJECT NO. 192500170

DRAWING NO. 8

SHEET 8 OF 9

ANSI D - 22" X 34"



REVISIONS	DATE	BY
6		
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PROJECT ENGINEER/ARCHITECT: K. STETTNER
PROJECT MANAGER: J. HOFMANN
DRAWN BY
SCALE
FIRST ISSUE DATE: 7/18/2008

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PROJECT: INNER LOOP IMPROVEMENT PROJECT
SOIO STREET TO CLINTON AVENUE
CITY OF ROCHESTER, NEW YORK

TITLE OF DRAWING: ACCIDENT COLLISION DIAGRAM PLAN

PROJECT NO. 192500170

DRAWING NO. 9

SHEET 9 OF 9

Plotting Information
Plotted By: Unknown
Design File: L:\192500170\transportation\preliminary\Drawing\Accident Sheets\Sheet 9_accident.dgn
Plotted: 11/12/2008
Time: 10:30:39 PM

Workspace:
Workset: Default
Project: NY_Highway_Design_Eng
Node: FREEMAN-GP2

ANSI D - 22" X 34"