City of Clarkston

2020

ROAD SAFETY PLAN

CITY OF CLARKSTON
PUBLIC WORKS DEPARTMENT

OWNER:
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February 2020

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2/27/2020

Introduction

The City of Clarkston is located within Asotin County in the south eastern corner of Washington. Clarkston was incorporated as a Washington City in 1902. The current population is 7,300 within the city limits but the urbanized area (city and adjacent county) population is over 32,000. The east-west main highway is US 12 (Bridge St.) that runs the width of the city from its western city limit boundary (15th St./Bridge St. (US 12)) to the Washington/Idaho state line on the east. The north-south highway corridor is SR 129. SR 129 starts at the intersection of Bridge St./Diagonal St. (SR 129)/2nd St. and proceeds to the southwest to the intersection of 6th St. (SR 129)/Diagonal St. (SR 129)/Maple St., from this point SR 129 (6th St.) proceeds south through the Clarkston downtown area to the southern city limits.

This Road Safety Plan was done to identify and address road networks and/or intersections that have a high accident rate. The information and data used in this Road Safety Plan was crash data from police reports at intersections, and studies and plans completed by the Lewis Clark Valley Metropolitan Planning Organization (LCVMPO). These include:

- North Clarkston Circulation Study
  http://lewisclarkmpo.org/DocumentCenter/View/408/2017-North-Clarkston-Circulation-Study

- 2019 Asotin County/City of Clarkston Transportation Plan
  http://lewisclarkmpo.org/2210/Clarkston-Asotin-Co-Transportation-Plan

- Valley Destination 2040 – Long Range Transportation Plan
  http://lewisclarkmpo.org/DocumentCenter/View/219/Appendix-2-Crash-Data-Analysis?bidId=

These plans and studies were used as reference for analysis and for supplemental crash data.

From the review of the plans and crash data, three road networks were identified for a high accident rate. These networks, as shown in Figure 1, are:

- Diagonal Street Network
- 13th Street Network
- Highland Avenue Network

These three networks are highly traveled corridors in the City of Clarkston. The functional classification of all three road networks is a minor arterial per the Clarkston Transportation Plan. These three networks are also a heavily traveled pedestrian route to schools, businesses, and hospitals.

Figure 1

CITY OF CLARKSTON
ROAD SAFETY PLAN
ACCIDENT CORRIDORS/NETWORKS
DIAGONAL STREET NETWORK
13TH STREET NETWORK
HIGHLAND AVENUE NETWORK
Port Way
Port Dr
Commercial Way
North St
Fair St
Bridge St (US12)
US 12
Poplar St
Maple St
Ash St
Elm St
Sycamore St
Chestnut St
Adams St
Park St
Oak St
Libby St
Highland Ave
Belmont Way
Chamberlain Ct
Diagonal St
Granite Lake Dr
Confluence Way
Interstate Bridge (US12)
Main St (Lewiston)
Riverview Blvd
Beachview Blvd
Red Wolf Crossing (SR128)
15th St
14th St
13th St
12th St
11th St
10th St
9th St
8th St
7th St
6th St
5th St
4th St
3rd St
2nd
Morrison Ave
Monroe St
Burns St
University St
McCarroll St
Billups St
Benjamin St
Acorn Ct
College Ct
Boston St
Francis St
Webster St
Van Arsdol St
Van Arsdol Ct
Washington St (pvt)
Birch St
Liberty Cir
Liberty Dr
Locust Ln (pvt)
SR 129
Teresa Ct
Lydon Ct
Sunrise Dr
Riverside Dr
Williams Ln
Southway Bridge
AR-Ramp
Rimview Dr
Frost Ln
Ashley Dr
Lambert Ct
Lambert Dr
18th Ave
18th Ave Ct
Powe Dr
Waldon Ln (pvt)
Pound Ln
16th Ave
Foster Ln
Dustan Lp
Scenic Way
Valley View Dr
NS-W Ramp
W-NS Ramp
E-N Ramp
NS-E Ramp

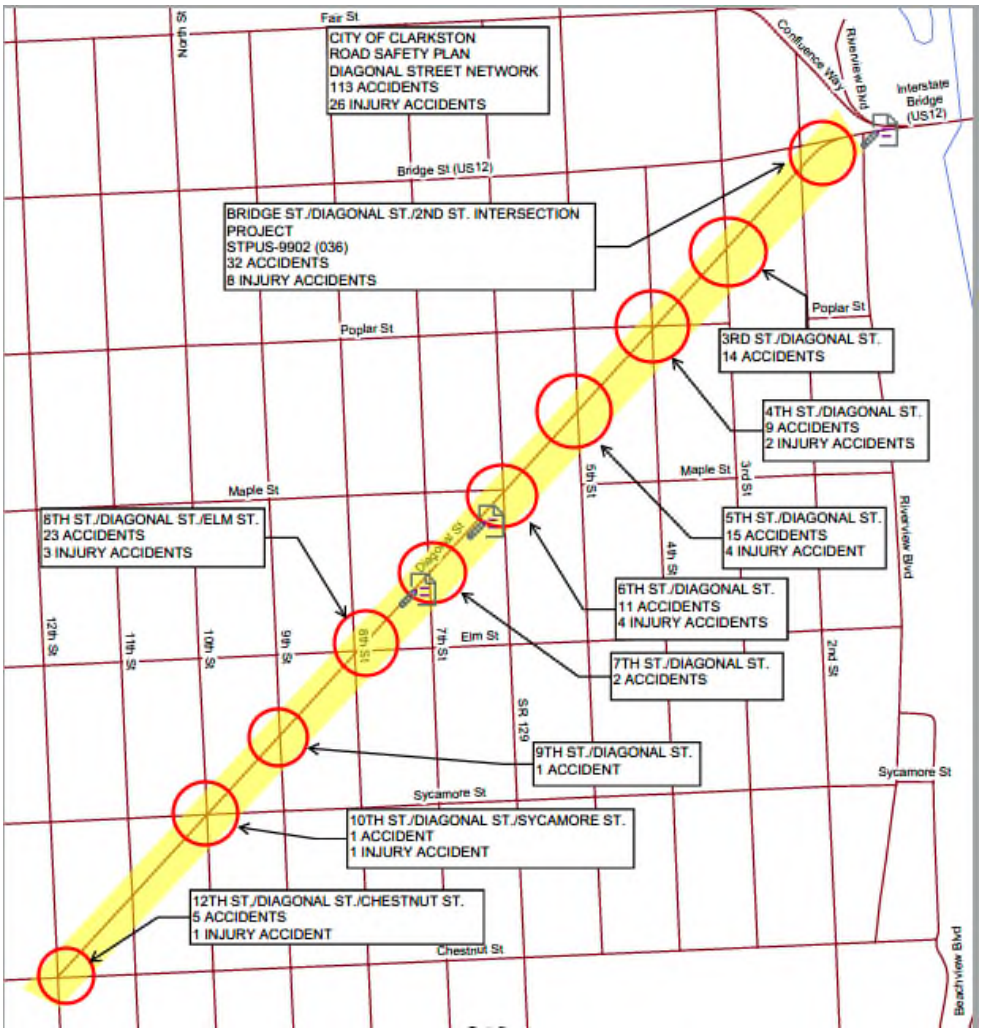
Diagonal Street Network

Introduction

The Diagonal Street Network is the highest accident rate network of the three identified. The Diagonal St. Network is shown in Figure 2. It has a total of 113 accidents with 26 injury accidents. The Diagonal Street Network runs from the intersection of Bridge St. (US 12)/2nd St./Diagonal St. (SR 129) to the intersection of 12th St./Chestnut St. The corridor is 0.92 miles long and is in a 60 ft wide right of way. Diagonal St. gets its name from how it is oriented to the Clarkston road grid. It runs at a 45 degree angle to the established roadway grid.

Geometrically and systemically this brings up some safety issues. Most of the accidents along this corridor are from failure to yield. The failure to yield can be caused by poor sight distance due to the angle of Diagonal St. to the other streets at the intersection and number of conflict points within the intersection. The higher accident rate intersections located on 2nd St. and 8th St. have 6 legs at the intersection.

Figure 2



Bridge St./Diagonal St./2nd St Intersection

The Bridge St./Diagonal St./2nd St. intersection was identified in the North Clarkston Circulation Study (NCCS) as their highest accident rate intersection in the city, 32 total accidents with 8 injury accidents. The NCCS also modeled the intersection operated at a LOS D and F on some of its existing legs. The Transportation Plan evaluated and listed this project as the number one priority intersection for construction in the plan. The number one priority rating in the CIP was due to the high accident rate. Figure 3 shows the top six priority intersection projects identified in the Transportation Plan.

Figure 3

Asotin County-Clarkston Transportation Plan — City of Clarkston CIP Table

Capital Improvement Plan (Intersection Projects) - Priority List

Overall Priority	Sub-priority	Project & Description	Estimated Cost	Potential Funding Sources	Related Projects
I1		**Bridge, 2nd, Diagonal; 5th and Bridge**	$ 1,707,700	Local, TBD, HSIP, STP, TIB	I5, S1, S2, S6, BMP#72
	1.0	Intersection Reconfiguration			
I2		**Diagonal St.; 8th St.; & Elm St.**	$ 1,995,800	Local, TBD, STP, TIB	O23, P4, S5, S6
	2.0	Intersection Reconfiguration			
I3		**13th Street & Highland Avenue**	$ 62,500	Local, TBD, STP, TIB, MPO	BMP#77
	3.0	Intersection Study			
I4		**5th St.; Fair St.; & Costco/Walmart**	$ 320,100	Local, TBD, TIB	O20, P9, S2, BMP#70, BMP#71
	4.0	Intersection Reconfiguration			
I5		**5th Street & Diagonal Street**	$ 62,500	Local, TBD, STP, TIB, MPO	O20, I1, I6, S2, S6
	5.0	Intersection Study			
I6		**6th Street & Diagonal Street**	$ 62,500	Local, TBD, STP, TIB, MPO	O8, I1, I5, S2, S6
	6.0	Intersection Study			
Intersection Projects Total				**$ 4,211,100**	

Funding Key

The MPO has awarded Regional STP funds for this project. The project FA # is STPUS-9902(036). This project is currently under design and is in the concept development phase. The three concepts under consideration are do nothing, upgrade signalized Intersection, or a channelized roundabout. The design consultant provided a Technical Memo (Appendix A) that evaluated the identified concepts and provided LOS modeling in 2040 for each alternative. The WSDOT Project Prospectus, Figure 4, for the project has the following current funding obligations.

Figure 4

Phase	Total Estimated Cost (Nearest Hundred Dollar)	Local Agency Funding (Nearest Hundred Dollar)	Federal Funds (Nearest Hundred Dollar)	Phase Start Date Month	Year
P.E.	$177,300	$35,300	$142,000	May	2019
R/W	$135,500	$15,500	$120,000	Feb	2020
Const.	$1,356,500	$182,500	$1,174,000	May	2022
Total	$1,669,300	$233,300	$1,436,000		

The preferred concept alternative is a channeled roundabout. Due to the existing high accident rate with the current signalized intersection, the channelized roundabout alternative will drastically reduce the conflict points and accident rate at this intersection. The channelized roundabout also increases pedestrian safety by having the pedestrians dealing with one direction of traffic when they cross a traffic lane. There are also refuge islands in the center of each road crossing to provide protection for the pedestrian as they make the crossing movement.

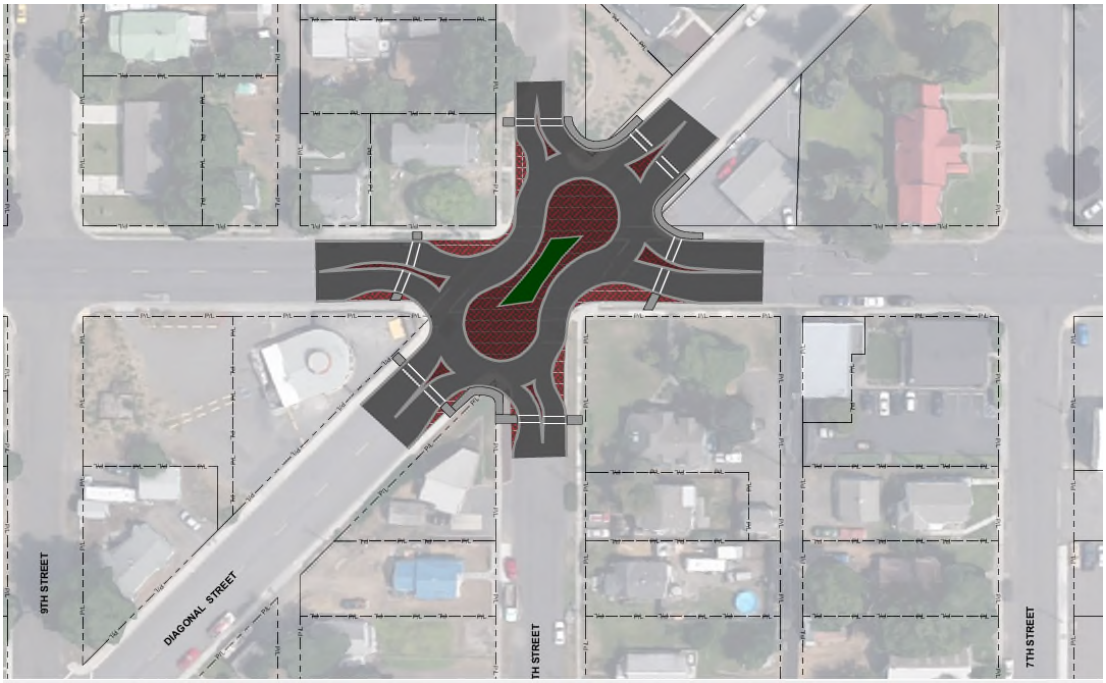
This alternative will take additional design time and additional construction costs to complete the project. The revised design and construction costs are estimated to be $2,200,000. This is a $530,700.00 shortfall in funding that Clarkston is needing to start construction on the project.

8th St./Diagonal St./Elm St. Intersection

The 8th St./ Diagonal St./Elm St. intersection is the second highest accident rate intersection on the Diagonal Street Network with 23 total accidents and 3 injury accidents as shown in Figure 2. This intersection is listed in the Transportation Plan as a CIP priority 2 as shown in Figure 3. The contributing factors identified in the accident reports are failure to yield (running stop sign) and poor sight distance due to intersection geometrics. This intersection is currently under consultant design using city funds. The concept alternatives identified were do nothing, 6 way stop signs, signalized intersection and a modified (peanut) roundabout. The consultant provided a Technical Memo (Appendix B) that analyzed each of the alternatives.

Police reports and safety evaluations determined that the 6 way stop sign alternative would not be much more effective than the current roadway configuration. The signalized intersection does not meet the traffic warrant conditions. The modified (peanut) roundabout as shown in Figure 5 reduces the existing intersection conflict points and eliminates the opportunities for the traveling public to run a stop sign.

Figure 5



The modified (peanut) roundabout also increases pedestrian safety by having the pedestrians dealing with one direction of traffic when they cross a traffic lane. There are also refuge islands in the center of each road crossing to provide protection for the pedestrian as they make the crossing movement.

The estimated cost for the modified roundabout is as follows:

	PE	$71,900.00 currently under design, funded by Clarkston.
	RW	$ 8,000.00
	CN	$750,100.00 per technical memo Appendix B.
TOTAL		$830,000.00

The modified (peanut) roundabout can be constructed within the existing right-of-way. It is anticipated that some minimal right-of-way will be required for curb radiuses to be increased for turning geometrics.

3rd St., 4th St.,5th St., and 6th St. Intersections

These four intersections account for 49 of the total 113 accidents in the Diagonal Street Network. The 6th St. Intersection is a signalized intersection. It was updated in a WSDOT project in 2018. It is anticipated that the work done on the two high accident rate intersections, Bridge St./2nd St./Diagonal St. and 8th St./Diagonal St./Elm St. has a traffic calming effect on the Diagonal Street Network. Monitoring of the accident rate on these intersections will continue to see if the improvements on the Bridge St./Diagonal St./2nd St. Intersection have a traffic calming affect on this section of the Diagonal St. network.

9th St., 10th St. and 12th St. Intersections

These three intersections account for 7 of the 113 accidents in the Diagonal Street Network. Due to the low ADT and accident rate of this section, the accident rates will continue to be monitored to see if the proposed intersection improvement at 8th St./Elm St./Diagonal St. has a traffic calming effect on this section of the Diagonal Street Network.

13th Street Network

Introduction

The 13th Street Network is the second highest accident network identified in this safety plan. This network has 116 accidents with 31 of those injury accidents. Figure 6 shows the accidents at each intersection in the 13th Street Network. 13th St. is functionally classified as a minor arterial. The 13th Street Network has been evaluated and solutions are signage updates for three intersections (Sycamore St., Poplar St., and Maple St.) and construction of mini-roundabouts at Chestnut St., Libby St., Elm St. and Highland Ave.

13th St. and Bridge St (US 12) Intersection

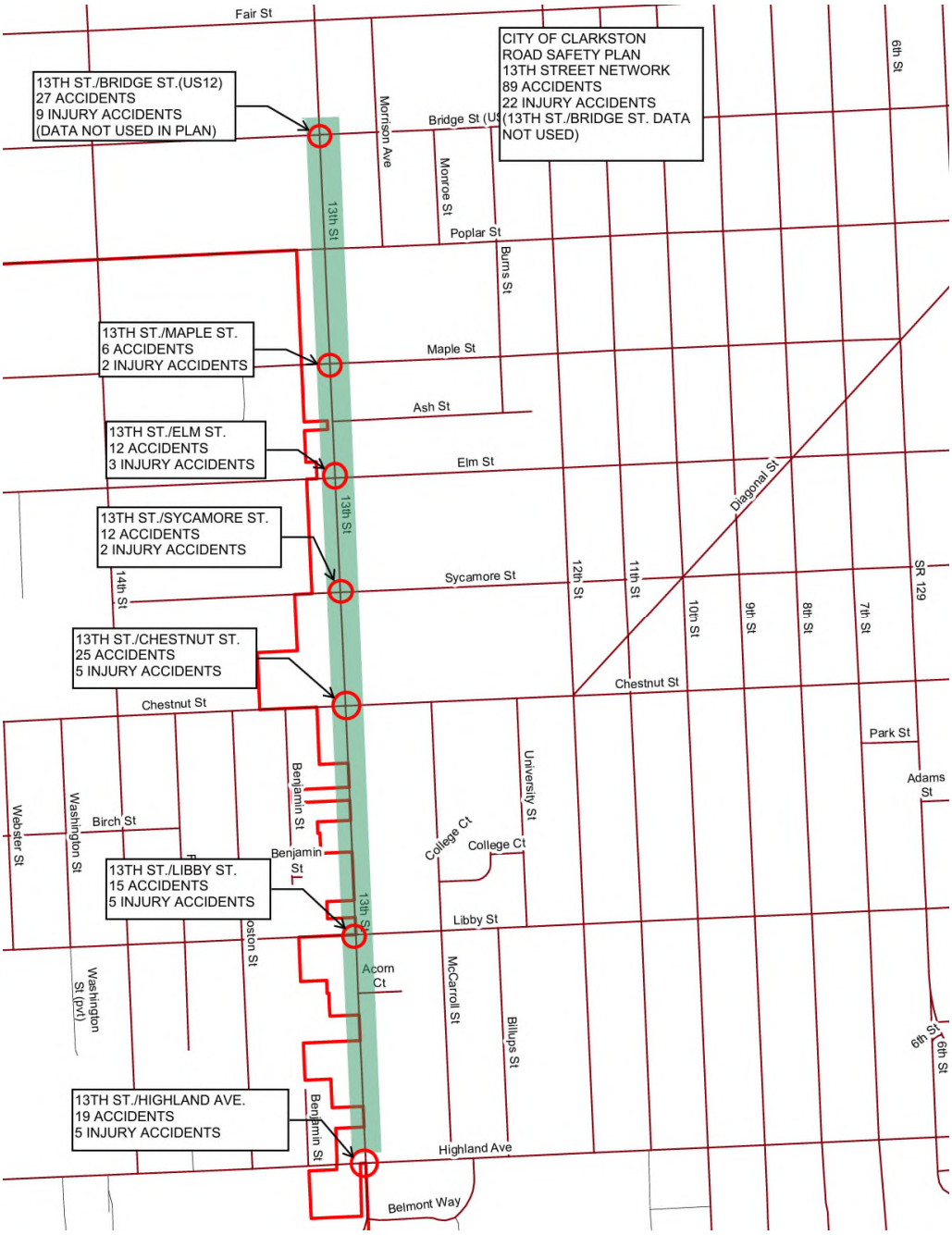
The intersection at 13th St. and Bridge St. (US 12) is a signalized intersection. WSDOT made some improvements to this intersection in 2017 with ADA ramps and updating signals. This intersection will continue to be monitored to see if the WSDOT improvements helped reduce the accident rate. Due to

these recent improvements, this intersection crash data was not used in the 13th St. Network safety analysis.

Maple St., Poplar St., Sycamore St. Intersections

These three intersections account for 30 accidents and 7 injury accidents. The majority of these accidents are failure to yield or running the stop sign. Maple St. and Poplar St. are functionally classified as local roads. The Transportation Plan recommended that Maple St. reclassified from a local road to a

Figure 6



minor collector. The intersections are stop controlled on the Maple St., Sycamore St., and Poplar St. legs.

The proposed solution for these three intersections is to update the stop signs with solar powered flashing warning lights around the perimeter of the sign along with "Stop Ahead" warning signs. The pedestrian crossing signs would also be upgraded in all four directions at each intersection.

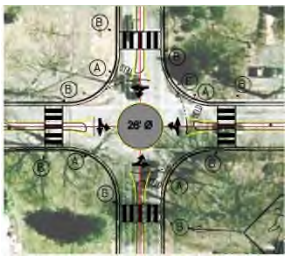
The estimated cost for the signage upgrade for each of these intersections is $8,000.00 per intersection. Total cost to do the sign upgrade for these three intersections is $24,000.00. All signage would comply with the MUTCD.

Chestnut St. Intersection

The Chestnut St. intersection is the highest accident rate intersection in the 13th Street Network. It has 25 accidents with 5 injury accidents. These accidents were due to failure to yield and failure to stop at the stop sign. Chestnut St. is functionally classified as a minor arterial. The intersection is stop controlled on the Chestnut St. legs. 13th St. is a through street with no stop signs. Traffic tends to exceed the posted 25 MPH speed limit on 13th St. The proposed solution for minimizing accidents at this intersection is a roundabout/mini-roundabout. The roundabout would reduce turning conflicts and would reduce speeds through this intersection. The roundabout also increases pedestrian safety by having the pedestrians dealing with one direction of traffic when they cross a traffic lane. There are also refuge islands in the center of each road crossing to provide protection for the pedestrian as they make the crossing movement.

Estimated costs are as follows:

	PE	$90,000.00
	RW	$10,000.00
	CN	$250,000.00
TOTAL		$350,000.00



The roundabout can be constructed within the existing right-of-way. It is anticipated that some minimal right-of-way will be required for curb radiuses to be increased for turning geometrics.

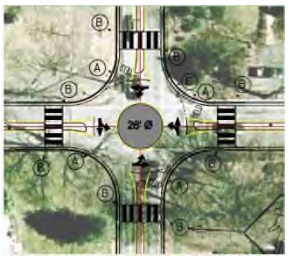
Highland Ave. Intersection

The Highland Avenue intersection is the second highest accident rate intersection in the 13th Street Network. This intersection has 19 accidents with 5 of them injury accidents. Highland Ave. is functionally classified as a minor collector. The 13th St./Highland Ave. intersection is a four-way stop controlled intersection. Accidents are attributed to failure to yield and running the stop sign. This intersection was the third highest priority of intersections listed on the Transportation Plan for CIP Intersection Projects as shown in Figure 3.

The proposed solution for minimizing accidents at this intersection is a roundabout/mini-roundabout. The roundabout would reduce turning conflicts and would reduce speeds through this intersection. . The roundabout also increases pedestrian safety by having the pedestrians dealing with one direction of traffic when they cross a traffic lane. There are also refuge islands in the center of each road crossing to provide protection of the pedestrian as they make the crossing movement.

Estimated costs are as follows:

PE	$90,000.00
RW	$20,000.00
CN	$250,000.00
TOTAL	$360,000.00



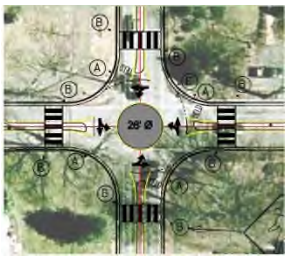
The roundabout can be constructed within the existing right-of-way. It is anticipated that some minimal right-of-way will be required for curb radiuses to be increased for turning geometrics.

Libby St. Intersection

Libby St. is the third highest accident rate intersection in the 13th Street Network. Libby St. has had 15 accidents with 5 injury accidents. Libby St. is functionally classified as a Major Collector. The intersection is stop controlled on the Libby St. leg. Traffic tends to exceed the posted 25 MPH speed limit on 13th St. The proposed solution for minimizing accidents at this intersection is a roundabout/mini-roundabout. The roundabout would reduce turning conflicts and would reduce speeds through this intersection. . The roundabout also increases pedestrian safety by having the pedestrians dealing with one direction of traffic when they cross a traffic lane. There are also refuge islands in the center of each road crossing to provide protection for the pedestrian as they make the crossing movement.

Estimated costs are as follows:

PE	$90,000.00
RW	$10,000.00
CN	$250,000.00
TOTAL	$350,000.00



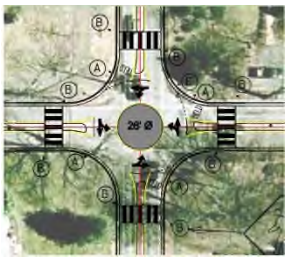
The roundabout can be constructed within the existing right-of-way. It is anticipated that some minimal right-of-way will be required for curb radiuses to be increased for turning geometrics.

Elm St. Intersection

Elm St. is the fourth highest accident rate intersection in the 13th Street Network. Elm St. has had 12 accidents with 3 injury accidents. Elm St. is functionally classified as a minor collector. The intersection is stop controlled on the Elm St. leg. Traffic tends to exceed the posted 25 MPH speed limit on 13th St. The proposed solution for minimizing accidents at this intersection is a roundabout/mini-roundabout. The roundabout would reduce turning conflicts and would reduce speeds through this intersection. The roundabout also increases pedestrian safety by having the pedestrians dealing with one direction of traffic when they cross a traffic lane. There are also refuge islands in the center of each road crossing to provide protection for the pedestrian as they make the crossing movement.

Estimated costs are as follows:

	PE	$90,000.00
	RW	$10,000.00
	CN	$250,000.00
TOTAL		$350,000.00



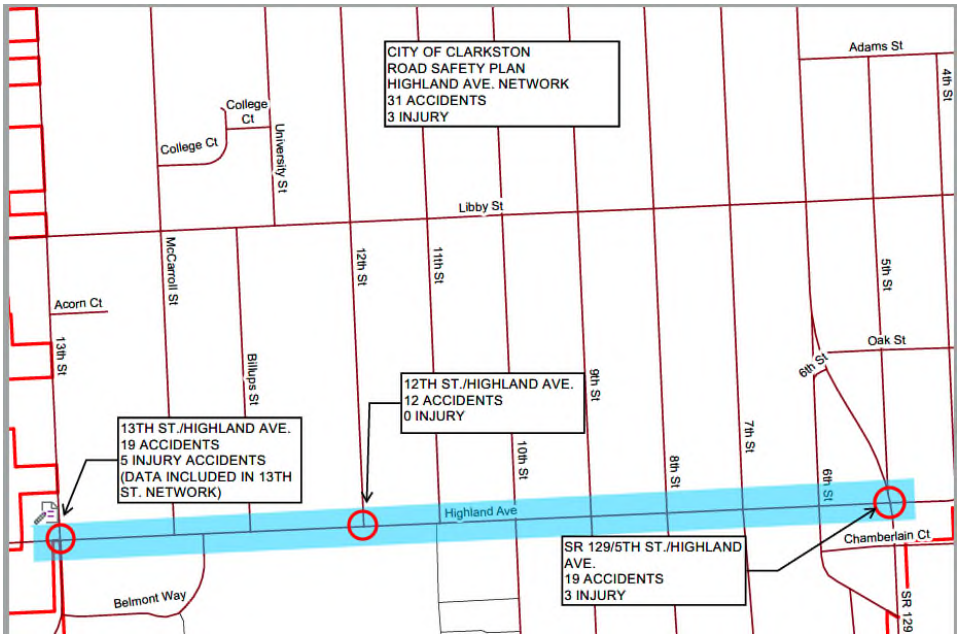
The roundabout can be constructed within the existing right-of-way. It is anticipated that some minimal right-of-way will be required for curb radiuses to be increased for turning geometrics.

Highland Avenue Network

Introduction

The Highland Avenue Network is the third highest accident rate network identified in this safety plan. This network has 31 accidents with 3 injury accidents. Figure 7 shows the network corridor. Highland Ave. is functionally classified as a minor arterial. This corridor serves as the main access to the Tri-State Memorial Hospital and its campus of medically related facilities along Highland Ave.

Figure 7



SR 129/ 5th St./Highland Ave. Intersection

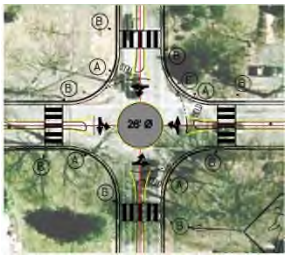
The SR 129/5th St./Highland Ave. Intersection is the highest accident rate intersection in the Highland Avenue Network. This intersection has 19 accidents with 3 injury accidents. This intersection is stop controlled on the Highland Ave. leg. Left turns are also not allowed on the Highland Ave. legs. Most accidents are failure to yield or rear end collisions. SR 129 is posted as 25 MPH at this intersection but north bound traffic is slowing down from a 35 MPH speed limit. Further study needs to be done on this intersection to fully evaluate the effective alternatives available. An intersection study is estimated to be $90,000.00. Further coordination with WSDOT also needs to be done in evaluating this section of SR 129.

12th St. and Highland Intersection

The 12th St. intersection has 12 accidents with no injury accidents. 12th St. is on the north side of Highland Ave. 12th St. is located across from one of the major entrances to Tri-State Memorial Hospital. This intersection has considerable pedestrian traffic crossing Highland Ave. from medical offices on the northside of Highland Ave. to the Tri-State Memorial Hospital campus on the southside. Traffic calming and slowing traffic down is the main safety focus of this intersection. The proposed solution for minimizing accidents at this intersection is a roundabout/mini-roundabout. The roundabout would reduce turning conflicts and would reduce speeds through this intersection. The roundabout also increases pedestrian safety by having the pedestrians dealing with one direction of traffic when they cross a traffic lane. There are also refuge islands in the center of each road crossing to provide protection for the pedestrian as they make the crossing movement.

Estimated costs are as follows:

PE	$90,000.00
RW	$10,000.00
CN	$250,000.00
TOTAL	$350,000.00



The roundabout can be constructed within the existing right-of-way. It is anticipated that some minimal right-of-way will be required for curb radiuses to be increased for turning geometrics.

Capital Improvement Plan (CIP) – Safety Projects

Introduction

The following CIP, Figure 8, has the identified safety projects listed on a priority basis. Priority was assigned based upon accident rate at location, ADT and by roadway network.

Figure 8

2020 Road Safety Plan
CIP Project Priorities

PRIORITY	PROJECT DESCRIPTION	PE	RW	CN	TOTAL COST	DESIGN YEAR	CONST YEAR
1	BRIDGE ST./DIAGONAL ST./2ND ST.	$177,300	$135,500	$1,887,200	$2,200,000	2019	2022
2	8TH ST./ELM ST./DIAGONAL ST.	$71,900	$8,000	$750,100	$830,000	2019	2020
3	HIGHLAND AVE./13TH ST.	$90,000	$20,000	$250,000	$360,000	2020	2021
4	CHESTNUT ST./13TH ST.	$90,000	$10,000	$250,000	$350,000	2021	2022
5	LIBBY ST./13TH ST.	$90,000	$10,000	$250,000	$350,000	2021	2022
6	ELM ST./13TH ST.	$90,000	$10,000	$250,000	$350,000	2021	2022
7	13TH ST. CORRIDOR SIGNAGE	$5,000	$0	$19,000	$24,000	2022	2023
8	12TH ST./HIGHLAND AVE.	$90,000	$10,000	$250,000	$350,000	2023	2024

APPENDIX A: Technical Memorandum FA# STPUS-9902(036)

KELLER ASSOCIATES

733 5th St, Suite A
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Technical Memorandum

DRAFT

TO: Kevin Poole, PE; City of Clarkston

FROM: Stillman Norton, PE; Keller Associates
Scott Linja, PE; Keller Associates
Alex Grover, PE, PTOE; Keller Associates

DATE: December 5, 2019

SUBJECT: FA# STPUS-9902(036) Bridge/2nd/Diagonal Intersection Concept Design; Planning Summary

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This memo summarizes previous planning efforts for the intersection of Bridge Street, 2nd Street, and Diagonal Street in Clarkston, WA, and evaluates the projected operational performance of several improvement alternatives being considered for Concept Design. The purpose of this analysis is to identify which alternative is anticipated to accommodate traffic growth for the longest period. The alternatives are:

- **Alternative #1: No Build** – Existing intersection configuration and signal control. This scenario was evaluated in the 2013 North Clarkston Study and 2017 Update.
- **Alternative #2: Restriping** – Restripe the 2nd Street approaches to add turn lanes. This improvement was developed through conversations with the City of Clarkston, and was not evaluated in previous planning efforts.
- **Alternative #3a: 4-Leg Signalized Intersection** – Reconstruct to a 4-leg signalized intersection, with two lanes eastbound. This improvement was originally proposed as "Long-Term Solution 1" in the 2013 North Clarkston Circulation Study and 2017 Update; however, its traffic operational performance was not evaluated in either study.
- **Alternative #3b: 4-Leg Signalized Intersection** – Reconstruct to a 4-leg signalized intersection, with one lane eastbound and a slip lane from Diagonal Street onto Bridge Street. This improvement was originally proposed and evaluated as "Short-Term Solution 2" in the 2013 North Clarkston Circulation Study and 2017 Update.
- **Alternative #4a: Multi-Lane Roundabout** – Reconstruct to a multi-lane roundabout with some restricted turning movements. This improvement was originally proposed as "Long-Term Solution 2" in the 2013 North Clarkston Circulation Study and 2017 Update; however, its traffic operational performance was not evaluated in either study.
- **Alternative #4b: Multi-Lane Roundabout** – Reconstruct to a multi-lane roundabout with all turning movements allowed. This improvement was developed as part of this planning summary, and was not evaluated in previous planning efforts.

Concept drawings for alternatives 1, 2, 3a, and 4a are attached to this memo (RE: Fig. 1, 2, 3, and 4 respectively). Figures for 3b and 4b can be developed prior to public involvement meetings if the City wishes to pursue public input on these alternatives. Although not displayed on the drawings, vehicle off-tracking analysis

was performed on the roundabout alternatives to verify the feasibility of accommodating WB-67 semi-trailers. Based on the analysis, all the alternatives allow transport of the design vehicle.

CAPACITY ANALYSIS

Table 1 below summarizes operational performance of each alternative. The analyses referenced projected 2040 PM Peak Hour volumes from the 2017 Update to the North Clarkston Circulation Study. Performance measures include 95th percentile queue length, level of service (LOS), delay, and v/c ratio (volume divided by capacity). Synchro 10 was used to analyze Alternatives #1 through #3. SIDRA Intersection 8 was used to analyze Alternative #4a and #4b. Analysis output sheets are attached to this memo.

Table 1: 2040 PM Peak Hour Operational Performance

Alternative	Longest Queue (95th Percentile)	Worst Movement		Average Intersection		
		LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	v/c
Alt #1 – No Build	> 860 feet (EB Thru)	LOS F	89.0 (SB Left)	LOS D	53.7	0.95
Alt #2 – Restriping	> 860 feet (EB Thru)	LOS F	88.1 (SB Left)	LOS D	51.4	0.93
Alt #3a – 4-Leg Signal, Two Lanes EB	579 feet (WB Thru)	LOS D	42.6 (WB Left)	LOS C	30.1	0.84
Alt #3b – 4-Leg Signal, One Lane EB	571 feet (EB Thru)	LOS D	50.9 (NB Left)	LOS C	26.5	0.85
Alt #4a – Dual-Lane Roundabout, with some restricted movements	84 feet (WB Thru)	LOS B	17.0 (NEB Left)	LOS A	8.2	0.49
Alt #4b – Dual-Lane Roundabout, with all movements allowed	436 feet (EB Thru)	LOS D	35.7 (EB Left)	LOS B	17.2	0.90

Alternative #4a, the dual-lane roundabout with some restricted movements, is expected to have the shortest queues, lowest delay, and highest capacity of the six alternatives in 2040.

OPINIONS OF PROBABLE COST

Cost estimates were drafted for each of the four alternatives for comparison and are attached to this memo. **Table 2** on the following page summarizes the cost estimates, advantages, and disadvantages for each of the alternatives.

It should be noted that construction costs have increased considerably in the past few years, which has increased the estimates for Alternatives #3a ("Long Term Solution 1"), 3b ("Short-Term Solution 2"), 4a ("Long Term Solution 2"), and 4b compared to previous studies.

Also of note, the 2017 North Clarkston Study estimated less asphalt section replacement than currently shown in the attached estimates. These actual quantities will be further refined through the design process with the selected concept following public input.

In addition, the cost estimates in previous studies assumed partial roadway reconstruction, whereas the most recent estimates assume full-depth roadway reconstruction of the entire intersection. These costs are also dependent on the findings of the geotechnical exploration and recommended roadway section for the intersection. Costs may be reduced in the design phase if geotechnical conditions allow reuse of any subgrade material. Alternative 4b (dual-lane roundabout, with all movements allowed) was not estimated due to it's lower Level of Service compared to Alternative 4a. Regardless, the cost of 4b would be similar to 4a.

Table 2: Alternative Evaluation Matrix

Alternative	Advantages	Disadvantages	Estimated Cost
Alt #1 – No Build	- No up-front costs - No ROW Acquisition	- Poor LOS - Long delays - Long vehicle queues - No improvements to pedestrian safety	- $ 0
Alt #2 – Restriping	- Low up-front cost - No ROW Acquisition	- Poor LOS - Long delays - No reduction to queue length - No improvements to pedestrian safety	- $ 26,000
Alt #3a – 4-Leg Signal, Two Lanes EB	- Improved LOS - Reduced delays - Reduced queue lengths - Improved pedestrian safety (shorter crosswalk distances)	- High up-front cost - ROW Acquisition - Some minor turning movements are prohibited	- $ 1,968,000
Alt #3b – 4-Leg Signal, One Lane EB	- Improved LOS - Reduced delays - Reduced queue lengths - Improved pedestrian safety (shorter crosswalk distances) - Less ROW Acquisition than 3a	- High up-front cost - ROW Acquisition - Some minor turning movements are prohibited	- $ 1,732,000
Alt #4a – Dual-Lane Roundabout, with some restricted movements	- Improved LOS - Lowest delay of the four alternatives (also lower than 4b) - Shortest queues - Improved pedestrian safety (shorter crosswalk distances) - Aesthetically pleasing gateway into the City	- High up-front cost - ROW Acquisition - Some minor turning movements may be prohibited	- $ 2,104,000
Alt #4b – Dual-Lane Roundabout, with all movements allowed	- Improved LOS - Lower delay than Alts 1-3 - Shorter queues than Alts 1-3 - Improved pedestrian safety (shorter crosswalk distances) - Aesthetically pleasing gateway into the City - No turning movements restricted	- Lower LOS than 4a at similar cost - High up-front cost - ROW Acquisition	Not Estimated

ATTACHMENTS

Concept Drawings

Opinions of Probable Cost

Capacity Analysis Output

KELLER ASSOCIATES

PROJECT NO. 219135-000	1=12 Inches	DRAWN: MC	CHECK: SL
SHEET NO. FIG. 1	PAGE	VERIFY SCALE: Scales based on 22"x34" prints.	

CLARKSTON BRIDGE - 2ND - DIAG INT
CONCEPT LAYOUTS

ALTERNATIVE NO. 1 - NO BUILD

City of Clarkston

NO.	REVISIONS	DATE

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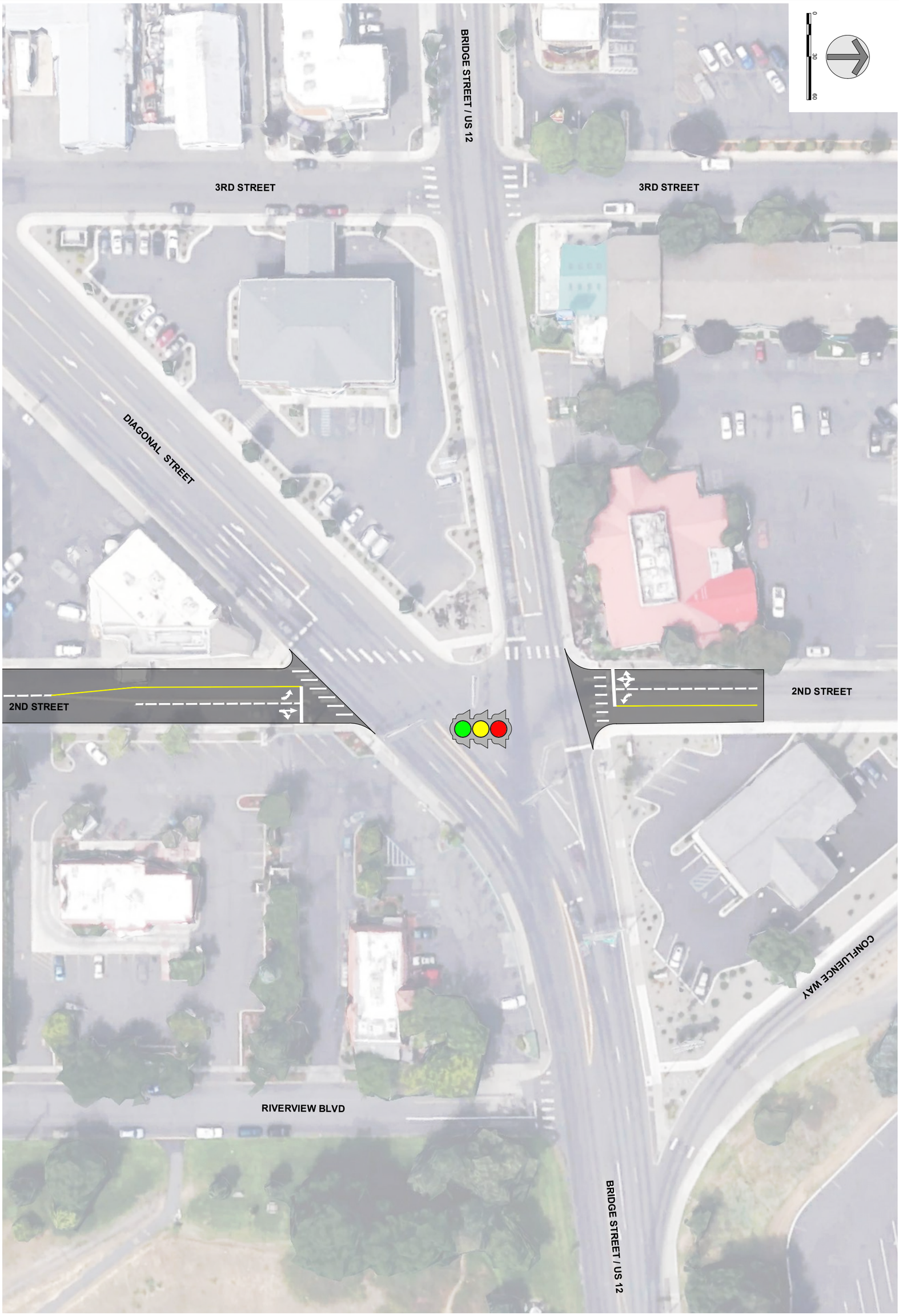

SHEET NO. FIG. 2	PROJECT NO. 219135-000	PAGE	1-1/2 Inches VERIFY SCALE: Scales based on 22"x34" prints.
DRAWN: MC	CHECK: SL		

CLARKSTON BRIDGE - 2ND - DIAG INT
CONCEPT LAYOUTS

ALTERNATIVE NO. 2 - RESTRIPING INTERSECTION

City of Clarkston

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City of Clarkston

CLARKSTON BRIDGE - 2ND - DIAG INT
CONCEPT LAYOUTS

ALTERNATIVE NO. 3 - 4-WAY
SIGNALIZED INTERSECTION

DRAWN: MC CHECK: SL

VERIFY SCALE: Scales based on 22"x34" prints.

1-1/2 Inches

PROJECT NO. 219135-000 PAGE

SHEET NO. FIG. 3

J:\219135 CLARKSTON 2ND-DIAG\C_DESN_CAD\1_FIGURES\FIGURE-3.DWG LAST SAVED: 11/20/2019 3:36 PM PRINTED: 11/20/2019 3:47 PM

J:\219135 CLARKSTON 2ND-DIAGIC_DESIN_CAD\1_FIGURES\FIGURE-3.DWG LAST SAVED: 1/23/2020 8:24 AM PRINTED: 1/23/2020 8:30 AM

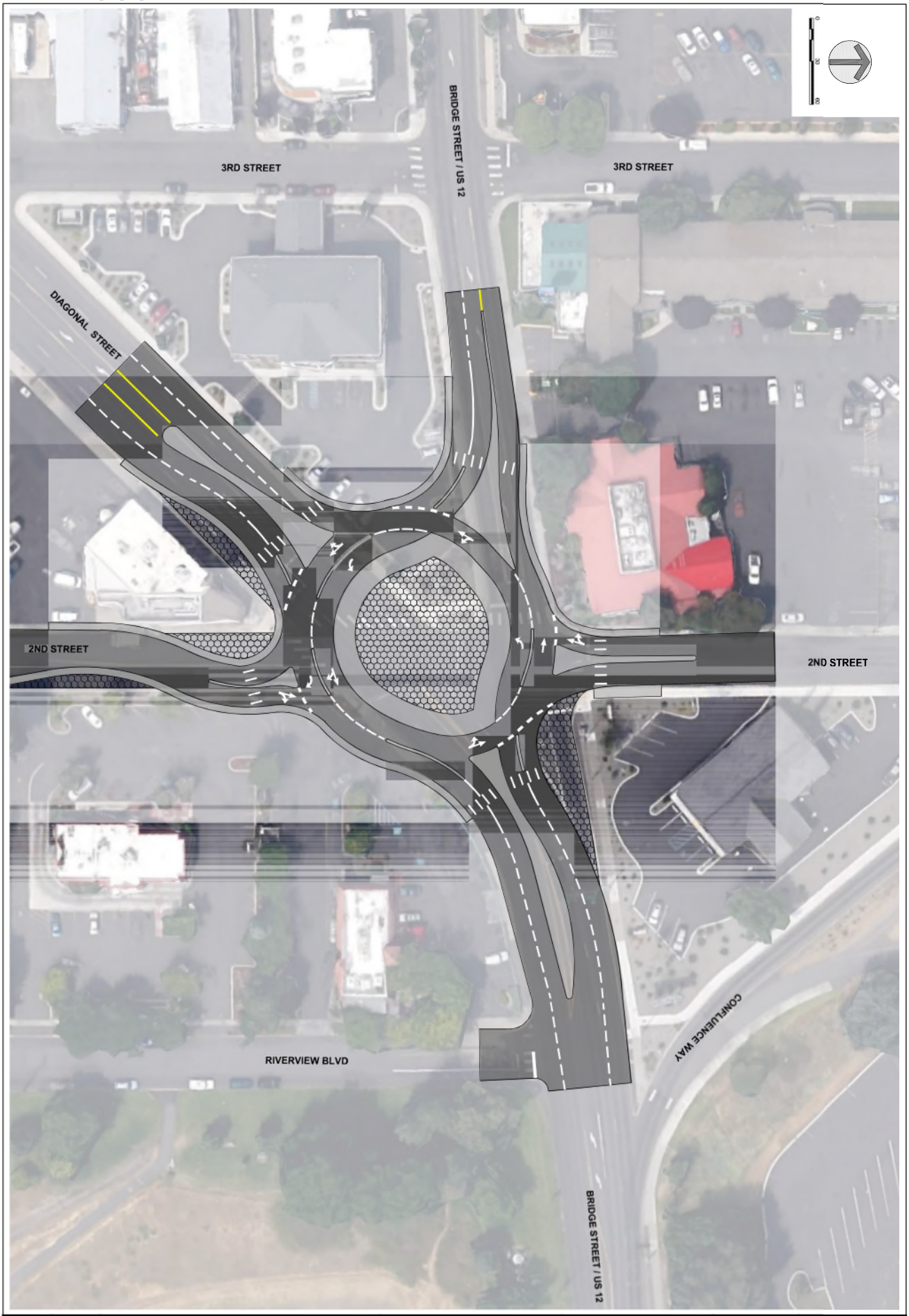

FIG. 3	SHEET NO.	219135-000	PROJECT NO.
	PAGE	1-1/2 inches	VERIFY SCALE: Scales based on 22"x34" prints.
DRAWN: MC	CHECK: SL		

CLARKSTON BRIDGE - 2ND - DIAG INT
CONCEPT LAYOUTS

ALTERNATIVE NO. 3 - ROUNDABOUT

City of Clarkston

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COST ESTIMATE

BRIDGE, 2ND, & DIAGONAL INTERSECTION IMPROVEMENTS

ALTERNATIVE 2 - RESTRIPING

CONCEPT PHASE

Opinion of Probable Cost (Major Items)

WSDOT Item #	Item Description	Approx. Quantity	Unit	Unit Price	Bid Price
0001	MOBILIZATION	10%	LS	$ 1,900	$1,900
0080	REMOVING BITUMINOUS PAVEMENT	-	SY	$ 4.00	$0
0100	REMOVING CEMENT CONC. SIDEWALK (2-02.5)	-	SY	$ 15.00	$0
0110	REMOVING CEMENT CONC. CURB & GUTTER (8-21.4)	-	LF	$ 6.00	$0
0187	REMOVING PAINT LINE	460	LF	$ 5.00	$2,300
0256	REMOVING SHAFT OBSTRUCTIONS (8-21.4)	-	EA	$ 2,000.00	$0
0257	REMOVING TRAFFIC SIGNAL SHAFT OBSTRUCTIONS	-	LS	$ 25,000	$0
0258	REMOVING SIGN STRUCTURE SHAFT OBSTRUCTIONS (8-21.4)	-	LS	$ 10,000.00	$0
0310	ROADWAY EXCAVATION INCL HAUL	-	CY	$ 20.00	$0
3080	ADJUST MANHOLE (7-05.5)	-	EA	$ 900.00	$0
3848	RESETTING EXISTING HYDRANTS (7-14.5)	-	EA	$ 3,500.00	$0
5095	CRUSHED SURFACING BASE COURSE	-	CY	$ 28.00	$0
5115	CRUSHED SURFACING TOP COURSE	-	CY	$ 40.00	$0
5305	EMULSIFIED ASPHALT CSS-1	-	TON	$ 500.00	$0
5767	HMA CL. 1/2 IN. PG 64-28	-	TON	$ 110.00	$0
6071	IRRIGATION SYSTEM	-	LS	$ 5,000.00	$0
6243	ADJUST VALVE BOX (7-05.5)	-	EA	$ 850.00	$0
6490	EROSION/WATER POLLUTION CONTROL (8-01.4(1))	-	LS	$ 15,000.00	$0
6700	CEMENT CONC. TRAFFIC CURB & GUTTER	-	LF	$ 45.00	$0
6702	MOUNTABLE CEMENT CONC. TRAFFIC CURB	-	LF	$ 55.00	$0
6709	ROUNDABOUT TRUCK APRON CEM. CONC CURB & GUTTER	-	LF	$ 35.00	$0
6806	PAINT LINE	530	LF	$ 0.50	$265
6833	PLASTIC TRAFFIC ARROW	4	EA	$ 150.00	$600
6857	PLASTIC CROSSWALK LINE	100	SF	$ 10.00	$1,000
6859	PLASTIC STOP LINE	55	LF	$ 20.00	$1,100
6890	PERMANENT SIGNING	-	EA	$ 500	$0
6904	ILLUMINATION SYSTEM	-	LS	$ 10,000	$0
6971	PROJECT TEMPORARY TRAFFIC CONTROL	1	LS	$ 10,000.00	$10,000
6980	FLAGGERS AND SPOTTERS	40	HR	$ 50.00	$2,000
6982	CONSTRUCTION SIGNS CLASS A	-	SF	$ 7.00	$0
6992	OTHER TRAFFIC CONTROL LABOR (MAINTENANCE)	40	HR	$ 40.00	$1,600
7038	ROADWAY SURVEYING	-	LS	$ 25,000	$0
7055	CEMENT CONCRETE SIDEWALK	-	SY	$ 55.00	$0
7058	CEMENT CONC. CURB RAMP TYPE A	-	EA	$ 2,000	$0
SP	REMOVE AND RESET SIGNS (8-12.4)	-	EA	$ 250.00	$0
SP	STORM DRAINAGE	-	LS	$ 40,000	$0
SP	LANDSCAPING	-	LS	$ 20,000.00	$0
SP	STAMPED CONCRETE (CENTER ISLAND)/BRICK PAVERS	-	SY	$ 120.00	$0
SP	SPLITTER ISLAND CONCRETE	-	SY	$ 100.00	$0
SP	TRAFFIC DRUMS	-	EA	$ 25.00	$0
SP	RIGHT OF WAY PURCHASE	-	SF	$ 55.00	$0
SP	SEAL COAT	-	SY	$ 3.50	$0
	SUBTOTAL *(Rounded up to the nearest $1,000)*				***$21,000***
	Contingency - CE & I	20%			$ 4,200
	TOTAL *(Rounded up to the nearest $1,000)*				***$26,000***

COST ESTIMATE

BRIDGE, 2ND, & DIAGONAL INTERSECTION IMPROVEMENTS

ALTERNATIVE 3A - MODIFIED SIGNAL

CONCEPT PHASE

Opinion of Probable Cost (Major Items)

WSDOT Item #	Item Description	Approx. Quantity	Unit	Unit Price	Bid Price
0001	MOBILIZATION	10%	LS	$ 149,100	$149,100
0080	REMOVING BITUMINOUS PAVEMENT	7,800	SY	$ 4.00	$31,200
0100	REMOVING CEMENT CONC. SIDEWALK (2-02.5)	410	SY	$ 15.00	$6,150
0110	REMOVING CEMENT CONC. CURB & GUTTER (8-21.4)	780	LF	$ 6.00	$4,680
0187	REMOVING PAINT LINE	100	LF	$ 5.00	$500
0256	REMOVING SHAFT OBSTRUCTIONS (8-21.4)	2	EA	$ 2,000.00	$4,000
0257	REMOVING TRAFFIC SIGNAL SHAFT OBSTRUCTIONS	1	LS	$ 25,000	$25,000
0258	REMOVING SIGN STRUCTURE SHAFT OBSTRUCTIONS (8-21.4)	-	LS	$ 10,000.00	$0
0310	ROADWAY EXCAVATION INCL HAUL	4,800	CY	$ 20.00	$96,000
3080	ADJUST MANHOLE (7-05.5)	5	EA	$ 900.00	$4,500
3848	RESETTING EXISTING HYDRANTS (7-14.5)	1	EA	$ 3,500.00	$3,500
5095	CRUSHED SURFACING BASE COURSE	2,600	CY	$ 28.00	$72,800
5115	CRUSHED SURFACING TOP COURSE	1,400	CY	$ 40.00	$56,000
5305	EMULSIFIED ASPHALT CSS-1	5	TON	$ 500.00	$2,500
5767	HMA CL. 1/2 IN. PG 64-28	1,800	TON	$ 110.00	$198,000
6071	IRRIGATION SYSTEM	1	LS	$ 5,000.00	$5,000
6243	ADJUST VALVE BOX (7-05.5)	10	EA	$ 850.00	$8,500
6490	EROSION/WATER POLLUTION CONTROL (8-01.4(1))	1	LS	$ 15,000.00	$15,000
6700	CEMENT CONC. TRAFFIC CURB & GUTTER	780	LF	$ 35.00	$27,300
6702	MOUNTABLE CEMENT CONC. TRAFFIC CURB	-	LF	$ 45.00	$0
6709	ROUNDABOUT TRUCK APRON CEM. CONC CURB & GUTTER	-	LF	$ 35.00	$0
6806	PAINT LINE	3,500	LF	$ 0.50	$1,750
6833	PLASTIC TRAFFIC ARROW	19	EA	$ 150.00	$2,850
6857	PLASTIC CROSSWALK LINE	530	SF	$ 10.00	$5,300
6859	PLASTIC STOP LINE	130	LF	$ 20.00	$2,600
6890	PERMANENT SIGNING	25	EA	$ 500	$12,500
6904	ILLUMINATION SYSTEM	1	LS	$ 10,000	$10,000
6912	TRAFFIC SIGNAL SYSTEM	1	LS	$ 500,000.00	$500,000
6971	PROJECT TEMPORARY TRAFFIC CONTROL	1	LS	$ 20,000.00	$20,000
6980	FLAGGERS AND SPOTTERS	100	HR	$ 50.00	$5,000
6982	CONSTRUCTION SIGNS CLASS A	640	SF	$ 7.00	$4,480
6992	OTHER TRAFFIC CONTROL LABOR (MAINTENANCE)	240	HR	$ 40.00	$9,600
7038	ROADWAY SURVEYING	1	LS	$ 25,000	$25,000
7055	CEMENT CONCRETE SIDEWALK	450	SY	$ 55.00	$24,750
7058	CEMENT CONC. CURB RAMP TYPE A	18	EA	$ 2,000	$36,000
SP	REMOVE AND RESET SIGNS (8-12.4)	10	EA	$ 250.00	$2,500
SP	STORM DRAINAGE	1	LS	$ 40,000	$40,000
SP	LANDSCAPING	-	LS	$ 20,000.00	$0
SP	STAMPED CONCRETE (CENTER ISLAND)/BRICK PAVERS	-	SY	$ 120.00	$0
SP	SPLITTER ISLAND CONCRETE	235	SY	$ 100.00	$23,500
SP	TRAFFIC DRUMS	50	EA	$ 25.00	$1,250
SP	RIGHT OF WAY PURCHASE	2,200	SF	$ 55.00	$121,000
SP	SEAL COAT	7,000	SY	$ 3.50	$24,500
	2% INFLATION TO 2022	1	LS	$ 57,328	$57,328
	SUBTOTAL *(Rounded up to the nearest $1,000)*				***$1,640,000***
	Contingency - CE & I	20%			$ 328,000
	TOTAL *(Rounded up to the nearest $1,000)*				***$1,968,000***

COST ESTIMATE

BRIDGE, 2ND, & DIAGONAL INTERSECTION IMPROVEMENTS

ALTERNATIVE 3B - MODIFIED SIGNAL

CONCEPT PHASE

Opinion of Probable Cost (Major Items)

WSDOT Item #	Item Description	Approx. Quantity	Unit	Unit Price	Bid Price
0001	MOBILIZATION	10%	LS	$ 131,200	$131,200
0080	REMOVING BITUMINOUS PAVEMENT	7,800	SY	$ 4.00	$31,200
0100	REMOVING CEMENT CONC. SIDEWALK (2-02.5)	225	SY	$ 15.00	$3,375
0110	REMOVING CEMENT CONC. CURB & GUTTER (8-21.4)	500	LF	$ 6.00	$3,000
0187	REMOVING PAINT LINE	100	LF	$ 5.00	$500
0256	REMOVING SHAFT OBSTRUCTIONS (8-21.4)	2	EA	$ 2,000.00	$4,000
0257	REMOVING TRAFFIC SIGNAL SHAFT OBSTRUCTIONS	1	LS	$ 25,000	$25,000
0258	REMOVING SIGN STRUCTURE SHAFT OBSTRUCTIONS (8-21.4)	-	LS	$ 10,000.00	$0
0310	ROADWAY EXCAVATION INCL HAUL	4,800	CY	$ 20.00	$96,000
3080	ADJUST MANHOLE (7-05.5)	5	EA	$ 900.00	$4,500
3848	RESETTING EXISTING HYDRANTS (7-14.5)	1	EA	$ 3,500.00	$3,500
5095	CRUSHED SURFACING BASE COURSE	2,310	CY	$ 28.00	$64,680
5115	CRUSHED SURFACING TOP COURSE	1,260	CY	$ 40.00	$50,400
5305	EMULSIFIED ASPHALT CSS-1	5	TON	$ 500.00	$2,500
5767	HMA CL. 1/2 IN. PG 64-28	1,700	TON	$ 110.00	$187,000
6071	IRRIGATION SYSTEM	1	LS	$ 5,000.00	$5,000
6243	ADJUST VALVE BOX (7-05.5)	10	EA	$ 850.00	$8,500
6490	EROSION/WATER POLLUTION CONTROL (8-01.4(1))	1	LS	$ 15,000.00	$15,000
6700	CEMENT CONC. TRAFFIC CURB & GUTTER	500	LF	$ 35.00	$17,500
6702	MOUNTABLE CEMENT CONC. TRAFFIC CURB	-	LF	$ 45.00	$0
6709	ROUNDABOUT TRUCK APRON CEM. CONC CURB & GUTTER	-	LF	$ 35.00	$0
6806	PAINT LINE	3,220	LF	$ 0.50	$1,610
6833	PLASTIC TRAFFIC ARROW	14	EA	$ 150.00	$2,100
6857	PLASTIC CROSSWALK LINE	530	SF	$ 10.00	$5,300
6859	PLASTIC STOP LINE	115	LF	$ 20.00	$2,300
6890	PERMANENT SIGNING	25	EA	$ 500	$12,500
6904	ILLUMINATION SYSTEM	1	LS	$ 10,000	$10,000
6912	TRAFFIC SIGNAL SYSTEM	1	LS	$ 500,000.00	$500,000
6971	PROJECT TEMPORARY TRAFFIC CONTROL	1	LS	$ 20,000.00	$20,000
6980	FLAGGERS AND SPOTTERS	100	HR	$ 50.00	$5,000
6982	CONSTRUCTION SIGNS CLASS A	640	SF	$ 7.00	$4,480
6992	OTHER TRAFFIC CONTROL LABOR (MAINTENANCE)	240	HR	$ 40.00	$9,600
7038	ROADWAY SURVEYING	1	LS	$ 25,000	$25,000
7055	CEMENT CONCRETE SIDEWALK	275	SY	$ 55.00	$15,125
7058	CEMENT CONC. CURB RAMP TYPE A	10	EA	$ 2,000	$20,000
SP	REMOVE AND RESET SIGNS (8-12.4)	10	EA	$ 250.00	$2,500
SP	STORM DRAINAGE	1	LS	$ 40,000	$40,000
SP	LANDSCAPING	-	LS	$ 20,000.00	$0
SP	STAMPED CONCRETE (CENTER ISLAND)/BRICK PAVERS	-	SY	$ 120.00	$0
SP	SPLITTER ISLAND CONCRETE	120	SY	$ 100.00	$12,000
SP	TRAFFIC DRUMS	50	EA	$ 25.00	$1,250
SP	RIGHT OF WAY PURCHASE	500	SF	$ 55.00	$27,500
SP	SEAL COAT	6,560	SY	$ 3.50	$22,960
	2% INFLATION TO 2022	1	LS	$ 50,435	$50,435
	SUBTOTAL *(Rounded up to the nearest $1,000)*				***$1,443,000***
	Contingency - CE & I	20%			$ 288,600
	TOTAL *(Rounded up to the nearest $1,000)*				***$1,732,000***

COST ESTIMATE

BRIDGE, 2ND, & DIAGONAL INTERSECTION IMPROVEMENTS

ALTERNATIVE 4 - ROUNDABOUT

CONCEPT PHASE

Opinion of Probable Cost (Major Items)

WSDOT Item #	Item Description	Approx. Quantity	Unit	Unit Price	Bid Price
0001	MOBILIZATION	10%	LS	$ 159,400	$159,400
0080	REMOVING BITUMINOUS PAVEMENT	6,800	SY	$ 4.00	$27,200
0100	REMOVING CEMENT CONC. SIDEWALK (2-02.5)	980	SY	$ 15.00	$14,700
0110	REMOVING CEMENT CONC. CURB & GUTTER (8-21.4)	1,400	LF	$ 6.00	$8,400
0187	REMOVING PAINT LINE	1,200	LF	$ 5.00	$6,000
0256	REMOVING SHAFT OBSTRUCTIONS (8-21.4)	3	EA	$ 2,000.00	$6,000
0257	REMOVING TRAFFIC SIGNAL SHAFT OBSTRUCTIONS	1	LS	$ 25,000	$25,000
0258	REMOVING SIGN STRUCTURE SHAFT OBSTRUCTIONS (8-21.4)	1	LS	$ 10,000.00	$10,000
0310	ROADWAY EXCAVATION INCL HAUL	4,200	CY	$ 20.00	$84,000
3080	ADJUST MANHOLE (7-05.5)	5	EA	$ 900.00	$4,500
3848	RESETTING EXISTING HYDRANTS (7-14.5)	1	EA	$ 3,500.00	$3,500
5095	CRUSHED SURFACING BASE COURSE	3,000	CY	$ 28.00	$84,000
5115	CRUSHED SURFACING TOP COURSE	1,500	CY	$ 40.00	$60,000
5305	EMULSIFIED ASPHALT CSS-1	5	TON	$ 500.00	$2,500
5767	HMA CL. 1/2 IN. PG 64-28	1,500	TON	$ 110.00	$165,000
6071	IRRIGATION SYSTEM	1	LS	$ 5,000.00	$5,000
6243	ADJUST VALVE BOX (7-05.5)	10	EA	$ 850.00	$8,500
6490	EROSION/WATER POLLUTION CONTROL (8-01.4(1))	1	LS	$ 15,000.00	$15,000
6700	CEMENT CONC. TRAFFIC CURB & GUTTER	400	LF	$ 35.00	$14,000
6702	MOUNTABLE CEMENT CONC. TRAFFIC CURB	1,600	LF	$ 45.00	$72,000
6709	ROUNDABOUT TRUCK APRON CEM. CONC CURB & GUTTER	380	LF	$ 35.00	$13,300
6806	PAINT LINE	1,300	LF	$ 0.50	$650
6833	PLASTIC TRAFFIC ARROW	9	EA	$ 150.00	$1,350
6857	PLASTIC CROSSWALK LINE	250	SF	$ 10.00	$2,500
6859	PLASTIC STOP LINE	160	LF	$ 20.00	$3,200
6890	PERMANENT SIGNING	25	EA	$ 500	$12,500
6904	ILLUMINATION SYSTEM	1	LS	$ 60,000	$60,000
6971	PROJECT TEMPORARY TRAFFIC CONTROL	1	LS	$ 30,000.00	$30,000
6980	FLAGGERS AND SPOTTERS	100	HR	$ 50.00	$5,000
6982	CONSTRUCTION SIGNS CLASS A	640	SF	$ 7.00	$4,480
6992	OTHER TRAFFIC CONTROL LABOR (MAINTENANCE)	240	HR	$ 40.00	$9,600
7038	ROADWAY SURVEYING	1	LS	$ 25,000	$25,000
7055	CEMENT CONCRETE SIDEWALK	980	SY	$ 55.00	$53,900
7058	CEMENT CONC. CURB RAMP TYPE A	15	EA	$ 2,000	$30,000
SP	REMOVE AND RESET SIGNS (8-12.4)	10	EA	$ 250.00	$2,500
SP	STORM DRAINAGE	1	LS	$ 40,000	$40,000
SP	LANDSCAPING	1	LS	$ 20,000.00	$20,000
SP	STAMPED CONCRETE (CENTER ISLAND)/BRICK PAVERS	560	SY	$ 120.00	$67,200
SP	SPLITTER ISLAND CONCRETE	700	SY	$ 100.00	$70,000
SP	TRAFFIC DRUMS	50	EA	$ 25.00	$1,250
SP	RIGHT OF WAY PURCHASE	8,000	SF	$ 55.00	$440,000
SP	SEAL COAT	7,000	SY	$ 3.50	$24,500
	2% INFLATION TO 2022	1	LS	$ 61,289	$61,289
	SUBTOTAL *(Rounded up to the nearest $1,000)*				***$1,753,000***
	Contingency - CE & I	20%			$ 350,600
	TOTAL *(Rounded up to the nearest $1,000)*				***$2,104,000***

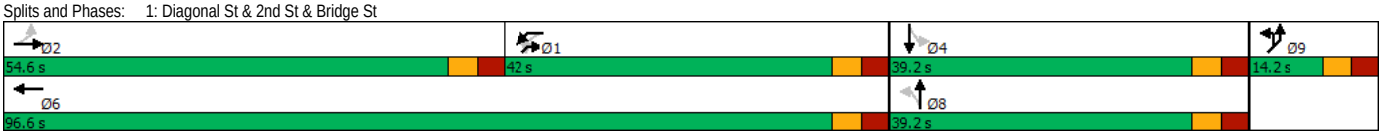
Lane Group	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SBR2	NEL	NER	NER2
Lane Configurations																	
Traffic Volume (vph)	1	553	4	2	349	539	6	23	10	28	243	8	1	2	14	467	3
Future Volume (vph)	1	553	4	2	349	539	6	23	10	28	243	8	1	2	14	467	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0		0		150	0		0	0		0		150	0	
Storage Lanes	1		0		2		1	0		0	0		0		1	2	
Taper Length (ft)	25				25			25			25				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt		0.999				0.998			0.939			0.999				0.850	
Flt Protected	0.950				0.950				0.981			0.954			0.950		
Satd. Flow (prot)	1770	1861	0	0	3433	1859	0	0	1716	0	0	1775	0	0	1770	2787	0
Flt Permitted	0.259				0.436				0.886			0.710			0.950		
Satd. Flow (perm)	482	1861	0	0	1576	1859	0	0	1550	0	0	1321	0	0	1770	2787	0
Right Turn on Red							Yes			Yes				Yes			Yes
Satd. Flow (RTOR)						1			26							113	
Link Speed (mph)		30				30			30			25			30		
Link Distance (ft)		352				313			335			193			480		
Travel Time (s)		8.0				7.1			7.6			5.3			10.9		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	601	4	2	379	586	7	25	11	30	264	9	1	2	15	508	3
Shared Lane Traffic (%)																	
Lane Group Flow (vph)	1	605	0	0	381	593	0	0	66	0	0	276	0	0	15	511	0
Turn Type	Perm	NA		custom	Prot	NA		Perm	NA		Perm	NA			Prot	Over	
Protected Phases		2			1	6			8			4			9	1	
Permitted Phases	2			1				8			4						
Detector Phase	2	2		1	1	6		8	8		4	4			9	1	
Switch Phase																	
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0		8.0	8.0		8.0	8.0			8.0	8.0	
Minimum Split (s)	14.2	14.2		29.2	29.2	26.2		39.2	39.2		39.2	39.2			14.2	29.2	
Total Split (s)	54.6	54.6		42.0	42.0	96.6		39.2	39.2		39.2	39.2			14.2	42.0	
Total Split (%)	36.4%	36.4%		28.0%	28.0%	64.4%		26.1%	26.1%		26.1%	26.1%			9.5%	28.0%	
Maximum Green (s)	48.4	48.4		35.8	35.8	90.4		33.0	33.0		33.0	33.0			8.0	35.8	
Yellow Time (s)	3.2	3.2		3.2	3.2	3.2		3.2	3.2		3.2	3.2			3.2	3.2	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0			3.0	3.0	
Lost Time Adjust (s)	0.0	0.0			0.0	0.0			0.0			0.0			0.0	0.0	
Total Lost Time (s)	6.2	6.2			6.2	6.2			6.2			6.2			6.2	6.2	
Lead/Lag	Lead	Lead		Lag	Lag											Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes											Yes	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5		1.5	1.5		1.5	1.5			1.0	2.5	
Recall Mode	None	None		None	None	Max		None	None		None	None			None	None	
Walk Time (s)				8.0	8.0	10.0					8.0	8.0				8.0	
Flash Dont Walk (s)				15.0	15.0	10.0					25.0	25.0				15.0	
Pedestrian Calls (#/hr)				4	4	4					4	4				4	
Act Effct Green (s)	48.6	48.6			35.9	90.7			31.8			31.8			8.0	35.9	
Actuated g/C Ratio	0.35	0.35			0.26	0.65			0.23			0.23			0.06	0.26	
v/c Ratio	0.01	0.94			0.95	0.49			0.18			0.92			0.15	0.64	
Control Delay	34.0	68.4			84.4	15.7			30.6			89.0			69.6	40.9	
Queue Delay	0.0	0.0			0.0	0.0			0.0			0.0			0.0	0.0	
Total Delay	34.0	68.4			84.4	15.7			30.6			89.0			69.6	40.9	
LOS	C	E			F	B			C			F			E	D	
Approach Delay		68.4				42.6			30.6			89.0			41.7		
Approach LOS		E				D			C			F			D		
90th %ile Green (s)	48.4	48.4		35.8	35.8	90.4		33.0	33.0		33.0	33.0			8.0	35.8	
90th %ile Term Code	Max	Max		Max	Max	MaxR		Hold	Hold		Max	Max			Max	Max	
70th %ile Green (s)	48.4	48.4		35.8	35.8	90.4		33.0	33.0		33.0	33.0			8.0	35.8	
70th %ile Term Code	Max	Max		Max	Max	MaxR		Hold	Hold		Max	Max			Max	Max	
50th %ile Green (s)	48.4	48.4		35.8	35.8	90.4		33.0	33.0		33.0	33.0			0.0	35.8	
50th %ile Term Code	Max	Max		Max	Max	MaxR		Hold	Hold		Max	Max			Skip	Max	
30th %ile Green (s)	48.4	48.4		35.8	35.8	90.4		33.0	33.0		33.0	33.0			0.0	35.8	
30th %ile Term Code	Max	Max		Max	Max	MaxR		Hold	Hold		Max	Max			Skip	Max	
10th %ile Green (s)	48.4	48.4		35.8	35.8	90.4		26.9	26.9		26.9	26.9			0.0	35.8	
10th %ile Term Code	Max	Max		Max	Max	MaxR		Hold	Hold		Gap	Gap			Skip	Max	
Queue Length 50th (ft)	1	507			169	238			28			235			13	177	
Queue Length 95th (ft)	5	#858			#309	427			76			#454			40	277	
Internal Link Dist (ft)		272				233			255			113			400		
Turn Bay Length (ft)	125														150		
Base Capacity (vph)	166	644			403	1202			385			312			101	797	
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	0.01	0.94			0.95	0.49			0.17			0.88			0.15	0.64	

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 140.3
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 53.7 — Intersection LOS: D
Intersection Capacity Utilization 97.2% — ICU Level of Service F
Analysis Period (min) 15

90th %ile Actuated Cycle: 150
70th %ile Actuated Cycle: 150
50th %ile Actuated Cycle: 135.8
30th %ile Actuated Cycle: 135.8
10th %ile Actuated Cycle: 129.7
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Diagonal St & 2nd St & Bridge St



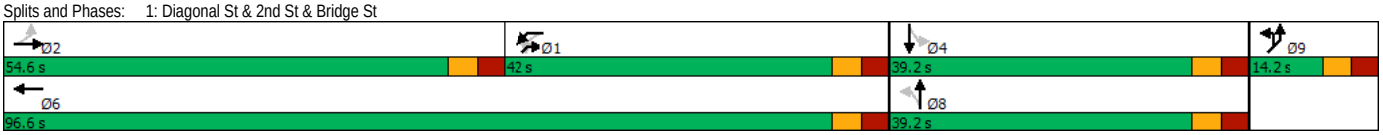
Lane Group	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SBR2	NEL	NER	NER2
Lane Configurations																	
Traffic Volume (vph)	1	553	4	2	349	539	6	23	10	28	243	8	1	2	14	467	3
Future Volume (vph)	1	553	4	2	349	539	6	23	10	28	243	8	1	2	14	467	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0		0		150	200		0	200		0		150	0	
Storage Lanes	1		0		2		1	1		0	1		0		1	2	
Taper Length (ft)	25				25			25			25				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt		0.999				0.998			0.890			0.962				0.850	
Flt Protected	0.950				0.950			0.950			0.950				0.950		
Satd. Flow (prot)	1770	1861	0	0	3433	1859	0	1770	1658	0	1770	1792	0	0	1770	2787	0
Flt Permitted	0.270				0.436			0.750			0.730				0.950		
Satd. Flow (perm)	503	1861	0	0	1576	1859	0	1397	1658	0	1360	1792	0	0	1770	2787	0
Right Turn on Red							Yes			Yes				Yes			Yes
Satd. Flow (RTOR)						1			30			2				113	
Link Speed (mph)		30				30			30			25			30		
Link Distance (ft)		352				313			335			193			480		
Travel Time (s)		8.0				7.1			7.6			5.3			10.9		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	601	4	2	379	586	7	25	11	30	264	9	1	2	15	508	3
Shared Lane Traffic (%)																	
Lane Group Flow (vph)	1	605	0	0	381	593	0	25	41	0	264	12	0	0	15	511	0
Turn Type	Perm	NA		custom	Prot	NA		Perm	NA		Perm	NA			Prot	Over	
Protected Phases		2			1	6			8			4			9	1	
Permitted Phases	2			1				8			4						
Detector Phase	2	2		1	1	6		8	8		4	4			9	1	
Switch Phase																	
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0		8.0	8.0		8.0	8.0			8.0	8.0	
Minimum Split (s)	14.2	14.2		29.2	29.2	26.2		39.2	39.2		39.2	39.2			14.2	29.2	
Total Split (s)	54.6	54.6		42.0	42.0	96.6		39.2	39.2		39.2	39.2			14.2	42.0	
Total Split (%)	36.4%	36.4%		28.0%	28.0%	64.4%		26.1%	26.1%		26.1%	26.1%			9.5%	28.0%	
Maximum Green (s)	48.4	48.4		35.8	35.8	90.4		33.0	33.0		33.0	33.0			8.0	35.8	
Yellow Time (s)	3.2	3.2		3.2	3.2	3.2		3.2	3.2		3.2	3.2			3.2	3.2	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0			3.0	3.0	
Lost Time Adjust (s)	0.0	0.0			0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0	
Total Lost Time (s)	6.2	6.2			6.2	6.2		6.2	6.2		6.2	6.2			6.2	6.2	
Lead/Lag	Lead	Lead		Lag	Lag											Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes											Yes	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5		1.5	1.5		1.5	1.5			1.0	2.5	
Recall Mode	None	None		None	None	Max		None	None		None	None			None	None	
Walk Time (s)				8.0	8.0	10.0					8.0	8.0				8.0	
Flash Dont Walk (s)				15.0	15.0	10.0					25.0	25.0				15.0	
Pedestrian Calls (#/hr)				4	4	4					4	4				4	
Act Effct Green (s)	48.7	48.7			36.0	90.9		29.4	29.4		29.4	29.4			8.0	36.0	
Actuated g/C Ratio	0.35	0.35			0.26	0.66		0.21	0.21		0.21	0.21			0.06	0.26	
v/c Ratio	0.01	0.92			0.93	0.48		0.08	0.11		0.91	0.03			0.15	0.63	
Control Delay	34.0	64.6			80.1	15.0		45.8	20.8		88.1	40.1			69.5	40.0	
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0	
Total Delay	34.0	64.6			80.1	15.0		45.8	20.8		88.1	40.1			69.5	40.0	
LOS	C	E			F	B		D	C		F	D			E	D	
Approach Delay		64.5				40.5			30.3			86.0			40.8		
Approach LOS		E				D			C			F			D		
90th %ile Green (s)	48.4	48.4		35.8	35.8	90.4		33.0	33.0		33.0	33.0			8.0	35.8	
90th %ile Term Code	Max	Max		Max	Max	MaxR		Hold	Hold		Max	Max			Max	Max	
70th %ile Green (s)	48.4	48.4		35.8	35.8	90.4		33.0	33.0		33.0	33.0			8.0	35.8	
70th %ile Term Code	Max	Max		Max	Max	MaxR		Hold	Hold		Max	Max			Max	Max	
50th %ile Green (s)	48.4	48.4		35.8	35.8	90.4		32.7	32.7		32.7	32.7			0.0	35.8	
50th %ile Term Code	Max	Max		Max	Max	MaxR		Hold	Hold		Gap	Gap			Skip	Max	
30th %ile Green (s)	48.4	48.4		35.8	35.8	90.4		27.7	27.7		27.7	27.7			0.0	35.8	
30th %ile Term Code	Max	Max		Max	Max	MaxR		Hold	Hold		Gap	Gap			Skip	Max	
10th %ile Green (s)	48.4	48.4		35.8	35.8	90.4		21.3	21.3		21.3	21.3			0.0	35.8	
10th %ile Term Code	Max	Max		Max	Max	MaxR		Hold	Hold		Gap	Gap			Skip	Max	
Queue Length 50th (ft)	1	505			168	236		17	7		220	7			13	177	
Queue Length 95th (ft)	5	#858			#309	427		48	43		#419	27			40	277	
Internal Link Dist (ft)		272				233			255			113			400		
Turn Bay Length (ft)	125							200			200				150		
Base Capacity (vph)	177	656			411	1224		336	421		327	432			103	810	
Starvation Cap Reductn	0	0			0	0		0	0		0	0			0	0	
Spillback Cap Reductn	0	0			0	0		0	0		0	0			0	0	
Storage Cap Reductn	0	0			0	0		0	0		0	0			0	0	
Reduced v/c Ratio	0.01	0.92			0.93	0.48		0.07	0.10		0.81	0.03			0.15	0.63	

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 138
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 51.4 — Intersection LOS: D
Intersection Capacity Utilization 96.6% — ICU Level of Service F
Analysis Period (min) 15

90th %ile Actuated Cycle: 150
70th %ile Actuated Cycle: 150
50th %ile Actuated Cycle: 135.5
30th %ile Actuated Cycle: 130.5
10th %ile Actuated Cycle: 124.1
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Diagonal St & 2nd St & Bridge St



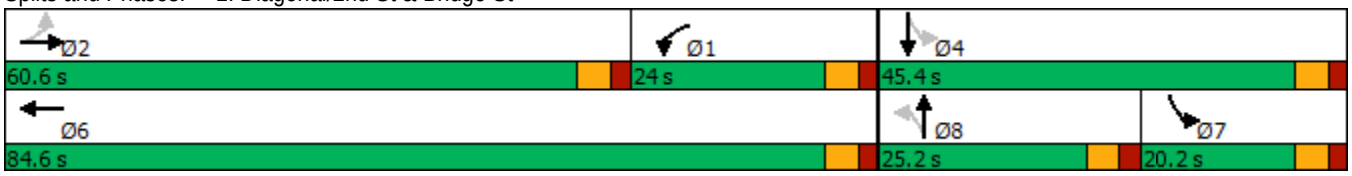
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	553	4	351	539	6	23	24	495	243	9	2
Future Volume (vph)	1	553	4	351	539	6	23	24	495	243	9	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	0		150	0		0	200		0
Storage Lanes	1		0	2		1	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.998				0.850		0.975	
Flt Protected	0.950			0.950				0.976		0.950		
Satd. Flow (prot)	1770	1861	0	3433	1859	0	0	1818	1583	1770	1816	0
Flt Permitted	0.276			0.950				0.839		0.724		
Satd. Flow (perm)	514	1861	0	3433	1859	0	0	1563	1583	1349	1816	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					1				390		2	
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		665			325			100			189	
Travel Time (s)		15.1			7.4			2.3			5.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.88
Adj. Flow (vph)	1	601	4	382	586	7	25	26	538	264	10	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	605	0	382	593	0	0	51	538	264	12	0
Turn Type	Perm	NA		Prot	NA		Perm	NA	Free	pm+pt	NA	
Protected Phases		2		1	6			8		7	4	
Permitted Phases	2						8		Free	4		
Detector Phase	2	2		1	6		8	8		7	4	
Switch Phase												
Minimum Initial (s)	8.0	8.0		5.0	8.0		8.0	8.0		5.0	8.0	
Minimum Split (s)	25.2	25.2		20.2	25.2		25.2	25.2		20.2	25.2	
Total Split (s)	60.6	60.6		24.0	84.6		25.2	25.2		20.2	45.4	
Total Split (%)	46.6%	46.6%		18.5%	65.1%		19.4%	19.4%		15.5%	34.9%	
Maximum Green (s)	55.4	55.4		18.8	79.4		20.0	20.0		15.0	40.2	
Yellow Time (s)	3.2	3.2		3.2	3.2		3.2	3.2		3.2	3.2	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	5.2	5.2		5.2	5.2			5.2		5.2	5.2	
Lead/Lag	Lead	Lead		Lag			Lead	Lead		Lag		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes		
Vehicle Extension (s)	2.5	2.5		2.5	2.5		1.5	1.5		3.0	1.5	
Recall Mode	Min	Min		None	Min		None	None		None	None	
Walk Time (s)	5.0	5.0			5.0		5.0	5.0			5.0	
Flash Dont Walk (s)	14.9	14.9			11.5		13.8	13.8			12.0	
Pedestrian Calls (#/hr)	4	4			4		4	4			4	
Act Effct Green (s)	36.4	36.4		15.7	57.8			10.4	95.5	26.4	26.4	
Actuated g/C Ratio	0.38	0.38		0.16	0.61			0.11	1.00	0.28	0.28	
v/c Ratio	0.01	0.85		0.68	0.53			0.30	0.34	0.60	0.02	
Control Delay	20.0	40.7		47.8	13.6			50.9	0.6	39.8	27.3	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	20.0	40.7		47.8	13.6			50.9	0.6	39.8	27.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	D		D	B			D	A	D	C	
Approach Delay		40.7			27.0			4.9			39.3	
Approach LOS		D			C			A			D	
90th %ile Green (s)	55.4	55.4		18.8	79.4		18.8	18.8		15.0	39.0	
90th %ile Term Code	Max	Max		Max	Hold		Ped	Ped		Max	Hold	
70th %ile Green (s)	43.5	43.5		18.8	67.5		8.8	8.8		15.0	29.0	
70th %ile Term Code	Gap	Gap		Max	Hold		Gap	Gap		Max	Hold	
50th %ile Green (s)	37.3	37.3		16.3	58.8		8.0	8.0		15.0	28.2	
50th %ile Term Code	Gap	Gap		Gap	Hold		Min	Min		Max	Hold	
30th %ile Green (s)	31.7	31.7		14.0	50.9		8.0	8.0		15.0	28.2	
30th %ile Term Code	Gap	Gap		Gap	Hold		Min	Min		Max	Hold	
10th %ile Green (s)	18.3	18.3		9.7	33.2		0.0	0.0		11.3	11.3	
10th %ile Term Code	Gap	Gap		Gap	Hold		Skip	Skip		Gap	Hold	
Queue Length 50th (ft)	0	337		115	197			31	0	136	4	
Queue Length 95th (ft)	4	571		216	358			79	0	268	21	
Internal Link Dist (ft)		585			245			20			109	
Turn Bay Length (ft)	125									200		
Base Capacity (vph)	322	1167		732	1510			354	1583	463	830	
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	0.00	0.52		0.52	0.39			0.14	0.34	0.57	0.01	

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 95.5
Natural Cycle: 105
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 26.5 Intersection LOS: C
Intersection Capacity Utilization 72.5% ICU Level of Service C
Analysis Period (min) 15
90th %ile Actuated Cycle: 128.8
70th %ile Actuated Cycle: 106.9
50th %ile Actuated Cycle: 97.4
30th %ile Actuated Cycle: 89.5
10th %ile Actuated Cycle: 54.9

Splits and Phases: 1: Diagonal/2nd St & Bridge St



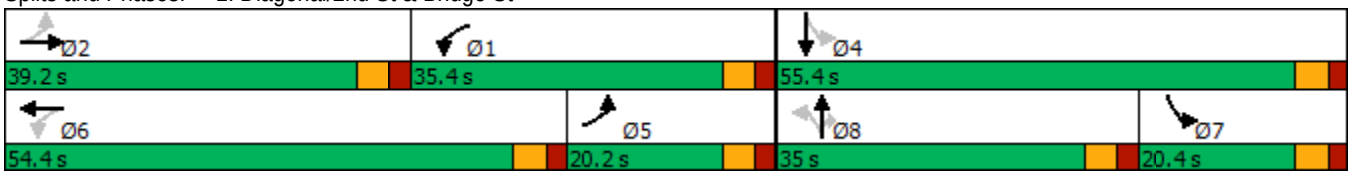
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	553	4	351	539	6	23	24	495	243	9	2
Future Volume (vph)	1	553	4	351	539	6	23	24	495	243	9	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	0		0	0		0	200		0
Storage Lanes	1		0	1		0	0		1	1		0
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		0.999			0.998				0.850		0.975	
Flt Protected	0.950			0.950				0.976		0.950		
Satd. Flow (prot)	1770	3536	0	1770	1859	0	0	1818	1583	1770	1816	0
Flt Permitted	0.188			0.266				0.861		0.724		
Satd. Flow (perm)	350	3536	0	495	1859	0	0	1604	1583	1349	1816	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					1				468		2	
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		665			325			120			189	
Travel Time (s)		15.1			7.4			2.7			5.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	601	4	382	586	7	25	26	538	264	10	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	605	0	382	593	0	0	51	538	264	12	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6			8		7	4	
Permitted Phases	2			6			8		8	4		
Detector Phase	5	2		1	6		8	8	8	7	4	
Switch Phase												
Minimum Initial (s)	4.0	8.0		5.0	8.0		8.0	8.0	8.0	5.0	8.0	
Minimum Split (s)	20.2	25.2		20.2	25.2		25.2	25.2	25.2	20.2	25.2	
Total Split (s)	20.2	39.2		35.4	54.4		35.0	35.0	35.0	20.4	55.4	
Total Split (%)	15.5%	30.2%		27.2%	41.8%		26.9%	26.9%	26.9%	15.7%	42.6%	
Maximum Green (s)	15.0	34.0		30.2	49.2		29.8	29.8	29.8	15.2	50.2	
Yellow Time (s)	3.2	3.2		3.2	3.2		3.2	3.2	3.2	3.2	3.2	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.2	5.2		5.2	5.2			5.2	5.2	5.2	5.2	
Lead/Lag	Lag	Lead		Lag	Lead		Lead	Lead	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	2.5		2.5	2.5		1.5	1.5	1.5	3.0	1.5	
Recall Mode	None	Min		None	Min		None	None	None	None	None	
Walk Time (s)		5.0			5.0		5.0	5.0	5.0		5.0	
Flash Dont Walk (s)		14.9			11.5		13.8	13.8	13.8		12.0	
Pedestrian Calls (#/hr)		4			4		4	4	4		4	
Act Effct Green (s)	27.9	21.3		42.4	40.1			13.4	13.4	34.0	34.0	
Actuated g/C Ratio	0.32	0.24		0.48	0.46			0.15	0.15	0.39	0.39	
v/c Ratio	0.00	0.70		0.82	0.70			0.21	0.84	0.44	0.02	
Control Delay	16.0	36.8		42.6	26.2			37.5	19.9	25.5	19.0	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	16.0	36.8		42.6	26.2			37.5	19.9	25.5	19.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	D		D	C			D	B	C	B	
Approach Delay		36.8			32.6			21.4			25.3	
Approach LOS		D			C			C			C	
90th %ile Green (s)	11.3	31.7		28.8	49.2		28.6	28.6	28.6	15.2	49.0	
90th %ile Term Code	Hold	Gap		Gap	Max		Gap	Gap	Gap	Max	Hold	
70th %ile Green (s)	0.0	24.7		19.1	49.0		17.2	17.2	17.2	15.2	37.6	
70th %ile Term Code	Skip	Gap		Gap	Hold		Gap	Gap	Gap	Max	Hold	
50th %ile Green (s)	0.0	20.7		14.6	40.5		9.8	9.8	9.8	15.2	30.2	
50th %ile Term Code	Skip	Gap		Gap	Hold		Gap	Gap	Gap	Max	Hold	
30th %ile Green (s)	0.0	17.6		11.4	34.2		8.0	8.0	8.0	15.2	28.4	
30th %ile Term Code	Skip	Gap		Gap	Hold		Min	Min	Min	Max	Hold	
10th %ile Green (s)	0.0	13.0		7.9	26.1		8.0	8.0	8.0	11.6	24.8	
10th %ile Term Code	Skip	Gap		Gap	Hold		Min	Min	Min	Gap	Hold	
Queue Length 50th (ft)	0	145		117	209			24	33	97	3	
Queue Length 95th (ft)	3	298		259	579			69	185	225	18	
Internal Link Dist (ft)		585			245			40			109	
Turn Bay Length (ft)	125									200		
Base Capacity (vph)	407	1458		799	1109			579	871	618	1106	
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	0.00	0.41		0.48	0.53			0.09	0.62	0.43	0.01	

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 87.5
Natural Cycle: 105
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 30.1 Intersection LOS: C
Intersection Capacity Utilization 72.5% ICU Level of Service C
Analysis Period (min) 15
90th %ile Actuated Cycle: 125.1
70th %ile Actuated Cycle: 97
50th %ile Actuated Cycle: 81.1
30th %ile Actuated Cycle: 73
10th %ile Actuated Cycle: 61.3

Splits and Phases: 1: Diagonal/2nd St & Bridge St



USER REPORT FOR SITE

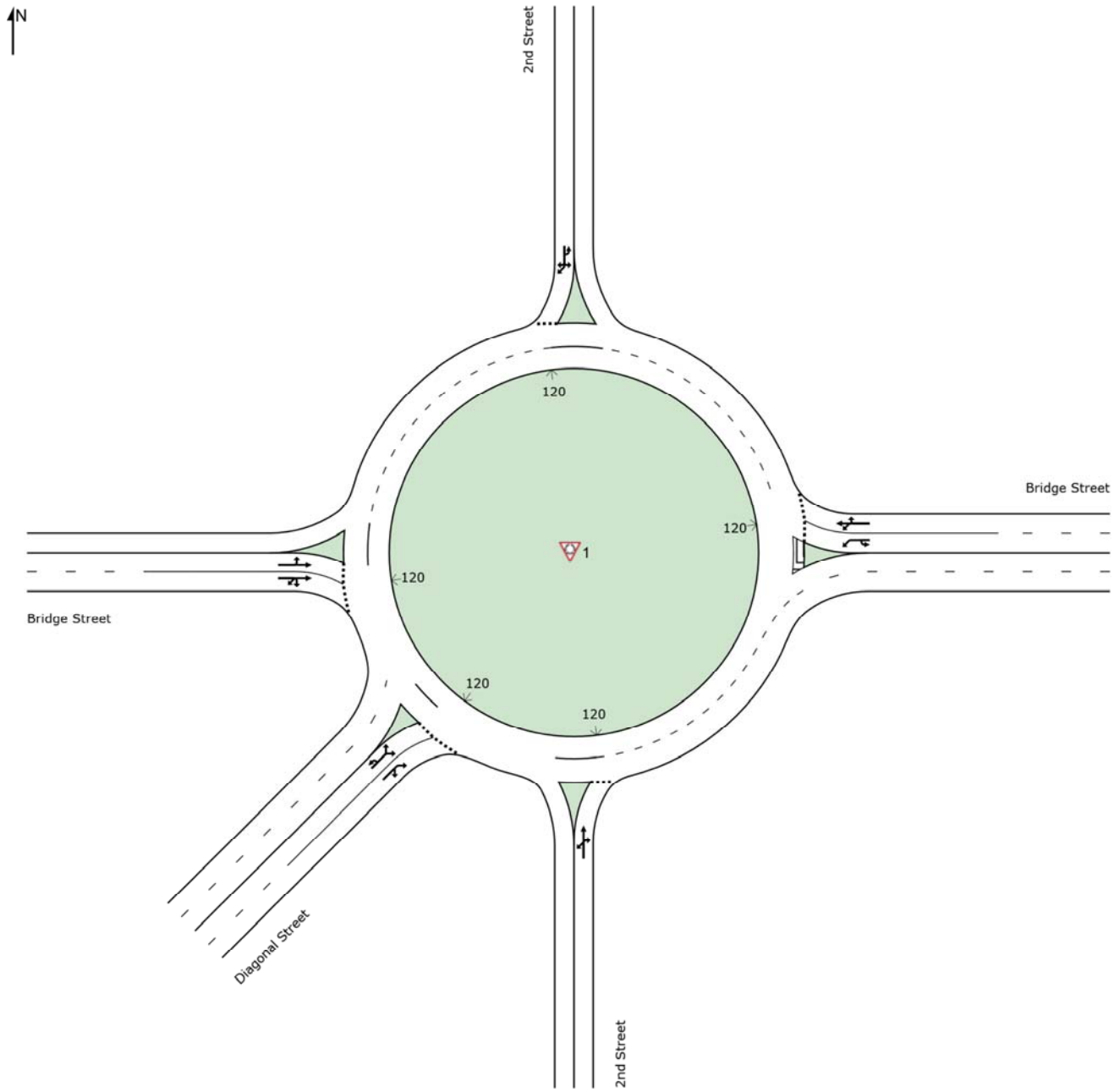
Project: PM_2040_Roundabout

Template: Roundabout Analysis
Summary by Movement

Site: 1 [PM_2040_Roundabout]

180' inscribed diameter, 120' island diameter, default entry radius and angle (65', 30 degrees)
Site Category: (None)
Roundabout

Site Layout

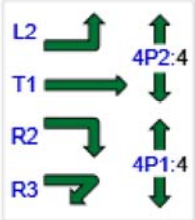


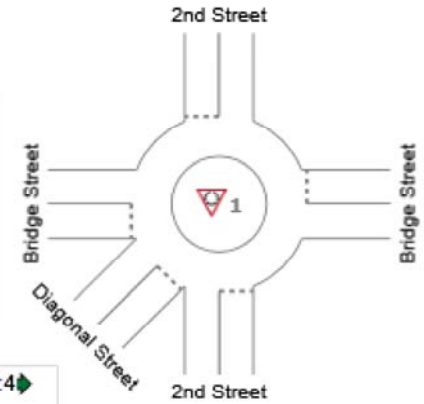
Input Volumes

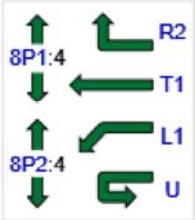
Volume Display Method: Total and %

	R2	R1	L2	U
Tot	2	9	243	1
LV	98%	98%	98%	97%
HV	2%	2%	2%	3%

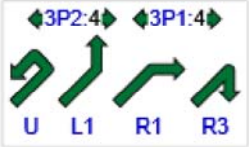
HV	LV	Tot	
2%	98%	1	L2
2%	98%	553	T1
2%	98%	4	R2
2%	98%	1	R3







	Tot	LV	HV
R2	6	98%	2%
T1	539	98%	2%
L1	351	98%	2%
U	1	97%	3%



	U	L1	R1	R3
Tot	1	14	467	3
LV	97%	98%	98%	98%
HV	3%	2%	2%	2%

	L3	T1	R2
Tot	1	33	28
LV	98%	98%	98%
HV	2%	2%	2%

	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: 2nd Street	62	61	1
E: Bridge Street	897	879	18
N: 2nd Street	255	250	5
W: Bridge Street	559	548	11
SW: Diagonal Street	485	475	10
Total	2258	2213	45

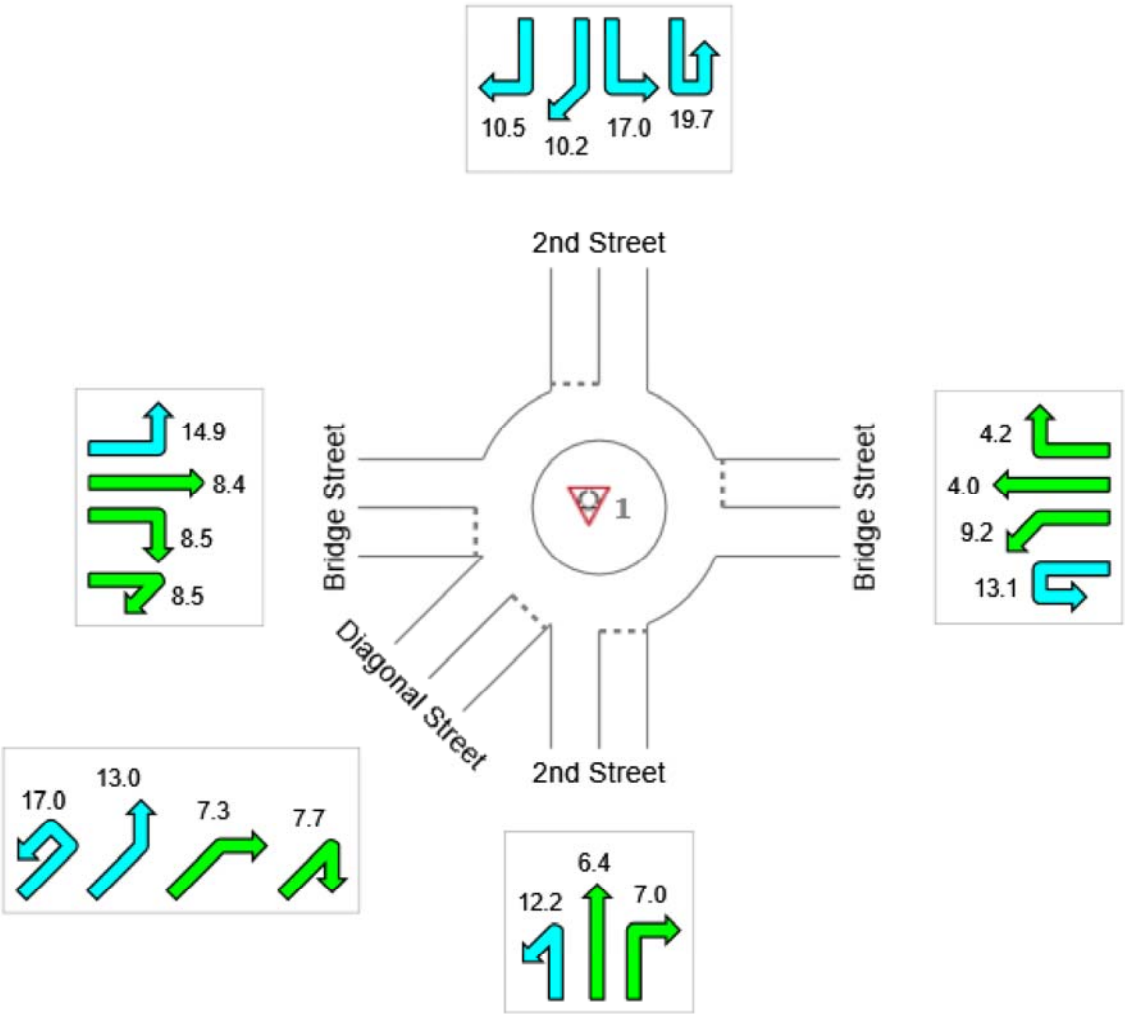
Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 2nd Street												
3b	L3	1	2.0	0.153	12.2	LOS B	0.6	15.6	0.71	0.72	0.71	25.6
8	T1	36	2.0	0.153	6.4	LOS A	0.6	15.6	0.71	0.72	0.71	23.3
18	R2	30	2.0	0.153	7.0	LOS A	0.6	15.6	0.71	0.72	0.71	23.7
Approach		67	2.0	0.153	6.8	LOS A	0.6	15.6	0.71	0.72	0.71	23.5
East: Bridge Street												
1u	U	1	3.0	0.310	13.1	LOS B	2.1	53.4	0.26	0.58	0.26	36.5
1a	L1	382	2.0	0.310	9.2	LOS A	2.1	53.4	0.26	0.58	0.26	34.9
6	T1	586	2.0	0.420	4.0	LOS A	3.3	84.1	0.27	0.37	0.27	37.7
16	R2	7	2.0	0.420	4.2	LOS A	3.3	84.1	0.27	0.37	0.27	36.3
Approach		975	2.0	0.420	6.1	LOS A	3.3	84.1	0.27	0.45	0.27	36.5
North: 2nd Street												
7u	U	1	3.0	0.492	19.7	LOS B	2.6	65.9	0.73	0.97	0.92	33.1
7	L2	264	2.0	0.492	17.0	LOS B	2.6	65.9	0.73	0.97	0.92	32.3
14a	R1	10	2.0	0.492	10.2	LOS B	2.6	65.9	0.73	0.97	0.92	31.7
14	R2	2	2.0	0.492	10.5	LOS B	2.6	65.9	0.73	0.97	0.92	31.1
Approach		277	2.0	0.492	16.7	LOS B	2.6	65.9	0.73	0.97	0.92	32.2
West: Bridge Street												
5	L2	1	2.0	0.409	14.9	LOS B	2.5	64.1	0.73	0.81	0.77	36.1
2	T1	601	2.0	0.409	8.4	LOS A	2.5	64.5	0.73	0.80	0.77	35.8
12	R2	4	2.0	0.409	8.5	LOS A	2.5	64.5	0.73	0.80	0.76	34.5
12b	R3	1	2.0	0.409	8.5	LOS A	2.5	64.5	0.73	0.80	0.76	34.0
Approach		608	2.0	0.409	8.4	LOS A	2.5	64.5	0.73	0.80	0.77	35.8
SouthWest: Diagonal Street												
5ux	U	1	3.0	0.386	17.0	LOS B	2.0	50.7	0.72	0.83	0.77	37.6
5ax	L1	15	2.0	0.386	13.0	LOS B	2.0	50.7	0.72	0.83	0.77	35.9
12ax	R1	508	2.0	0.386	7.3	LOS A	2.0	51.4	0.71	0.81	0.77	35.9
12bx	R3	3	2.0	0.386	7.7	LOS A	2.0	51.4	0.71	0.79	0.77	34.6
Approach		527	2.0	0.386	7.5	LOS A	2.0	51.4	0.71	0.81	0.77	35.9
All Vehicles		2454	2.0	0.492	8.2	LOS A	3.3	84.1	0.54	0.68	0.59	35.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Delay (Control)

All Movement Classes

	Approaches					Intersection
	South	East	North	West	Southwest	
Delay (Control)	6.8	6.1	16.7	8.4	7.5	8.2
LOS	A	A	B	A	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: SIDRA Roundabout LOS

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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USER REPORT FOR SITE

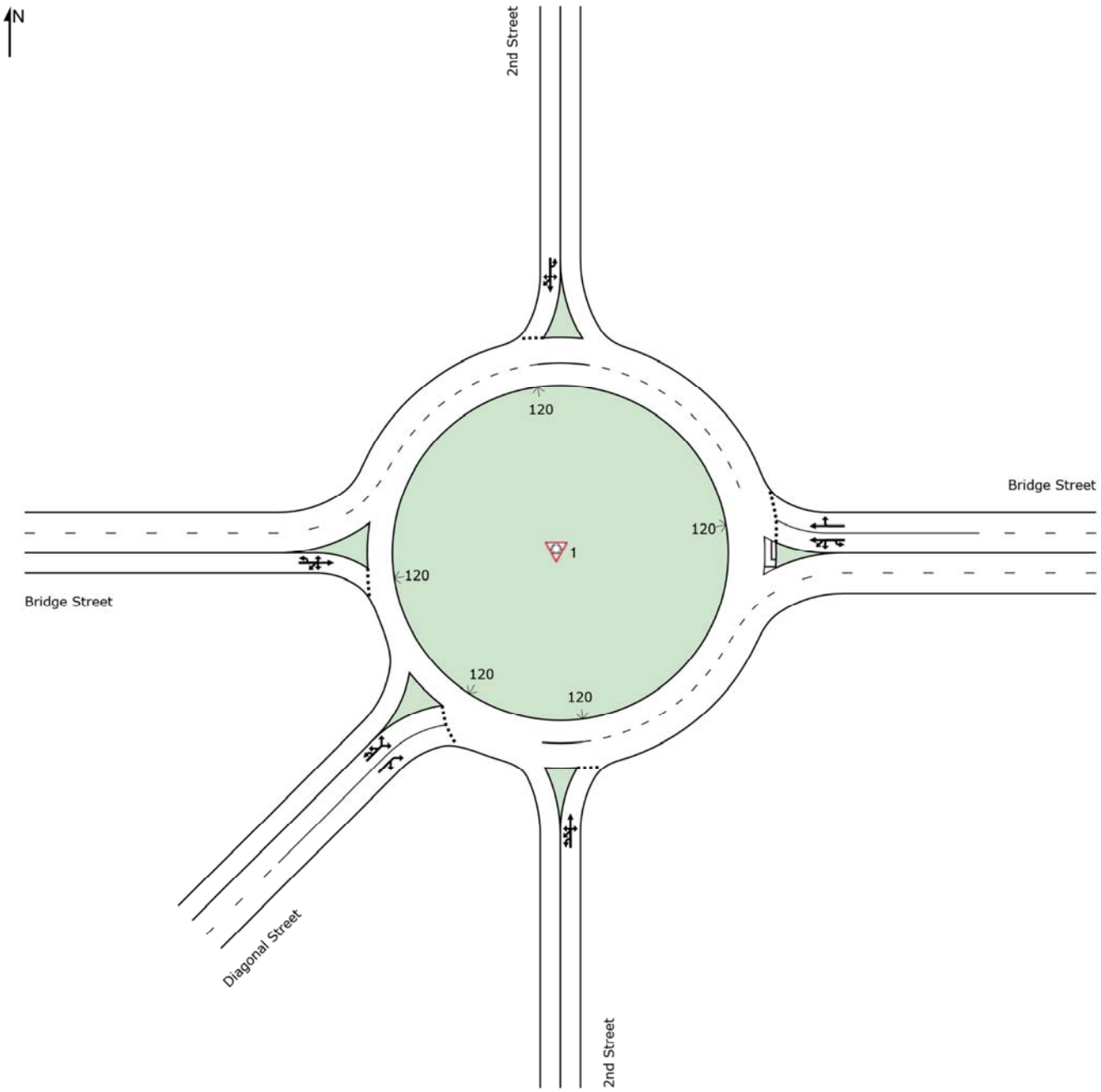
Project: PM_2040_Alt 4b Roundabout

Template: Roundabout Analysis Summary by Movement

Site: 1 [PM_2040_Alt 4b Roundabout]

180' inscribed diameter, 120' island diameter, default entry radius and angle (65', 30 degrees)
Site Category: (None)
Roundabout

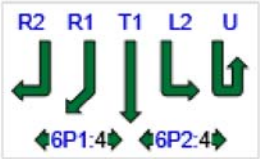
Site Layout



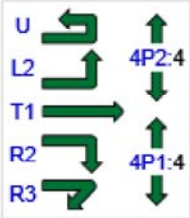
Input Volumes

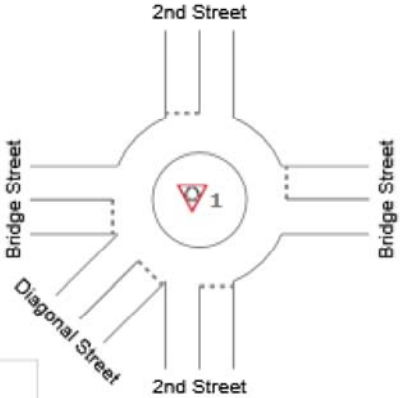
Volume Display Method: Total and %

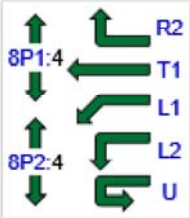
	R2	R1	T1	L2	U
Tot	2	1	8	243	1
LV	98%	98%	98%	98%	97%
HV	2%	2%	2%	2%	3%



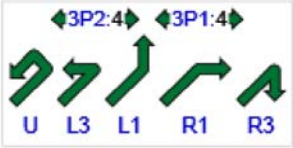
HV	LV	Tot	
3%	97%	1	U
2%	98%	1	L2
2%	98%	553	T1
2%	98%	4	R2
2%	98%	1	R3







	Tot	LV	HV
R2	6	98%	2%
T1	539	98%	2%
L1	349	98%	2%
L2	2	98%	2%
U	1	97%	3%



	U	L3	L1	R1	R3
Tot	1	1	14	467	3
LV	97%	98%	98%	98%	98%
HV	3%	2%	2%	2%	2%

	U	L3	L2	T1	R2
Tot	1	1	23	10	28
LV	97%	98%	98%	98%	98%
HV	3%	2%	2%	2%	2%

	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: 2nd Street	63	62	1
E: Bridge Street	897	879	18
N: 2nd Street	255	250	5
W: Bridge Street	560	549	11
SW: Diagonal Street	486	476	10
Total	2261	2216	45

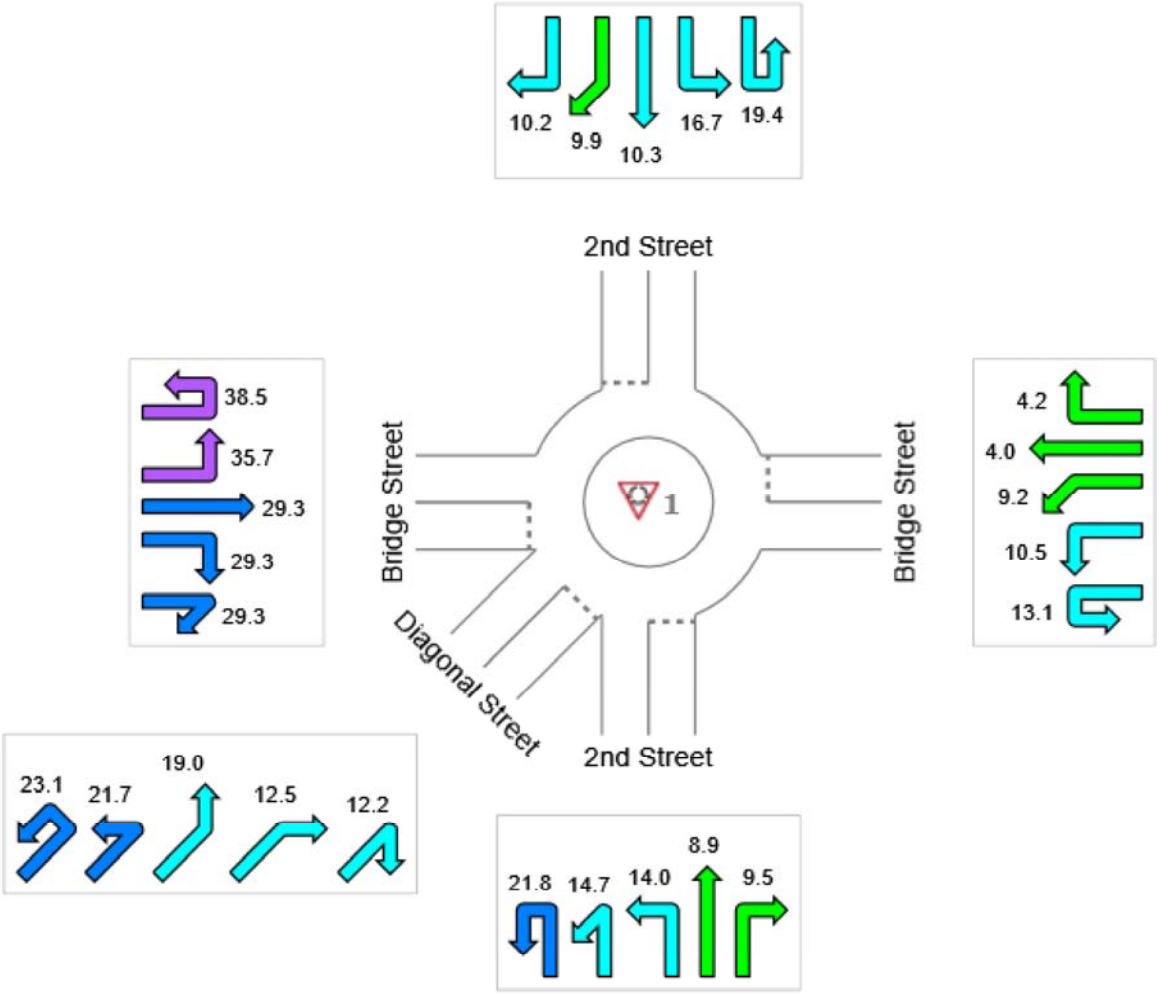
Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 2nd Street												
3u	U	1	3.0	0.192	21.8	LOS C	0.9	22.9	0.79	0.85	0.79	28.0
3b	L3	1	2.0	0.192	14.7	LOS B	0.9	22.9	0.79	0.85	0.79	24.4
3	L2	25	2.0	0.192	14.0	LOS B	0.9	22.9	0.79	0.85	0.79	24.0
8	T1	11	2.0	0.192	8.9	LOS A	0.9	22.9	0.79	0.85	0.79	22.3
18	R2	30	2.0	0.192	9.5	LOS A	0.9	22.9	0.79	0.85	0.79	22.7
Approach		68	2.0	0.192	11.3	LOS B	0.9	22.9	0.79	0.85	0.79	23.2
East: Bridge Street												
1u	U	1	3.0	0.359	13.1	LOS B	2.6	66.7	0.27	0.55	0.27	37.0
1	L2	2	2.0	0.359	10.5	LOS B	2.6	66.7	0.27	0.55	0.27	35.9
1a	L1	379	2.0	0.359	9.2	LOS A	2.6	66.7	0.27	0.55	0.27	35.4
6	T1	586	2.0	0.359	4.0	LOS A	2.6	67.3	0.27	0.39	0.27	37.4
16	R2	7	2.0	0.359	4.2	LOS A	2.6	67.3	0.27	0.37	0.27	36.3
Approach		975	2.0	0.359	6.1	LOS A	2.6	67.3	0.27	0.46	0.27	36.5
North: 2nd Street												
7u	U	1	3.0	0.491	19.4	LOS B	2.5	63.0	0.72	0.96	0.91	33.3
7	L2	264	2.0	0.491	16.7	LOS B	2.5	63.0	0.72	0.96	0.91	32.4
4	T1	9	2.0	0.491	10.3	LOS B	2.5	63.0	0.72	0.96	0.91	32.2
14a	R1	1	2.0	0.491	9.9	LOS A	2.5	63.0	0.72	0.96	0.91	31.9
14	R2	2	2.0	0.491	10.2	LOS B	2.5	63.0	0.72	0.96	0.91	31.2
Approach		277	2.0	0.491	16.4	LOS B	2.5	63.0	0.72	0.96	0.91	32.4
West: Bridge Street												
5u	U	1	3.0	0.897	38.5	LOS D	17.2	435.9	1.00	1.46	2.20	27.9
5	L2	1	2.0	0.897	35.7	LOS D	17.2	435.9	1.00	1.46	2.20	27.3
2	T1	601	2.0	0.897	29.3	LOS C	17.2	435.9	1.00	1.46	2.20	27.1
12	R2	4	2.0	0.897	29.3	LOS C	17.2	435.9	1.00	1.46	2.20	26.4
12b	R3	1	2.0	0.897	29.3	LOS C	17.2	435.9	1.00	1.46	2.20	26.1
Approach		609	2.0	0.897	29.3	LOS C	17.2	435.9	1.00	1.46	2.20	27.1
SouthWest: Diagonal Street												
5ux	U	1	3.0	0.473	23.1	LOS C	3.9	99.2	0.96	1.03	1.12	34.2
5bx	L3	1	2.0	0.473	21.7	LOS C	3.9	99.2	0.96	1.03	1.12	33.8
5ax	L1	15	2.0	0.473	19.0	LOS B	3.9	99.2	0.96	1.03	1.12	32.8
12ax	R1	508	2.0	0.473	12.5	LOS B	4.3	108.0	0.97	1.01	1.11	33.3
12bx	R3	3	2.0	0.473	12.2	LOS B	4.3	108.0	0.98	1.00	1.11	32.6
Approach		528	2.0	0.473	12.7	LOS B	4.3	108.0	0.97	1.01	1.11	33.3
All Vehicles		2458	2.0	0.897	14.6	LOS B	17.2	435.9	0.67	0.89	1.02	32.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Delay (Control)

All Movement Classes

	Approaches					Intersection
	South	East	North	West	Southwest	
Delay (Control)	11.3	6.1	16.4	29.3	12.7	14.6
LOS	B	A	B	C	B	B



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: SIDRA Roundabout LOS
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

APPENDIX B: Technical Memorandum 8th St./Diagonal St./Elm St.

KELLER ASSOCIATES

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Clarkston, WA 99403

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-DRAFT- Technical Memorandum

TO: Kevin Poole, City of Clarkston

FROM: Scott Linja, PE
Stillman Norton, PE
Alex Grover, PE, PTOE

DATE: January 24, 2020

SUBJECT: City of Clarkston: 8th Street, Elm Street, and Diagonal Street – Alternatives Analysis

INTRODUCTION

The City of Clarkston contracted with Keller Associates to investigate options for the intersection located at 8th Street, Elm Street, and Diagonal Street in Clarkston, Washington. The intersection is currently a 6-way intersection; it is a combined 4-way stop (both legs of Diagonal Street and 8th Street), and a two free flowing through movements (Elm Street). This intersection has consistently been a problem area for the City regarding safety, with numerous crashes having occurred at this location in previous years. The intersection also routinely confuses drivers, which can cause additional delays to the stop-controlled movements and increases the potential for crashes and accidents. The goal of this project is to analyze the existing intersection conditions, provide potential alternatives to improve the operation and safety of the intersection, and to forecast and analyze how the intersection would operate in the future.

During the planning discussions for this project, the following alternatives were identified as potential alternatives for this intersection to be investigated:

- **Alternative 1 – "Do Nothing":** This alternative would leave the intersection as-is.
- **Alternative 2 – All-way Stop:** This alternative would modify the existing intersection into an all-way stop, in which all movements would be stop controlled (6-way stop).
- **Alternative 3 – Signalized Intersection:** This alternative would modify the exiting intersection into a signalized intersection.
- **Alternative 4 – Roundabout:** This alternative would modify the existing intersection into a roundabout specifically configured to handle all legs of the intersection.

Concept layout figures were created for each of the alternatives listed above. Full-size figures of the concept layouts can be found in **Attachment A**. Planning level cost estimates for each of the alternatives were also developed, and can be found in **Attachment B**.

EXISTING CONDITIONS ANALYSIS

Existing Intersection Characteristics

The intersection of 8th Street, Elm Street, and Diagonal Street is geographically located in the middle of the City of Clarkston. The six-leg intersection as a unique existing geometry that makes sight distance and stopping sight distance limited for select movements, which has contributed to the increased number of accidents at this location. See summary of intersection characteristics listed for each of the Streets on the following page:

Table 1: Existing Intersection Street Characteristics

Street Characteristic	8th Street	Elm Street	Diagonal Street
Approx. Pavement Width	35 feet	40 feet	42 feet
Right-of-Way Width	60 feet	60 feet	60 feet
Speed Limit	25 mph	25 mph	25 mph

There are stop signs on 8th Street and Diagonal Street with Elm Street having priority as uncontrolled through traffic. The area around the intersection is partially residential with the exception of the southwest corner (which is currently occupied by the Sinoloa Mexican restaurant), and the southern corner (which is currently occupied by a local Chiropractor).The northwest corner also previously housed a local business, but it is our understanding that this building is currently vacant. There are existing pedestrian crossings on all legs of the intersection, but it should be noted that the existing pedestrian ramps do not appear to meet current ADA requirements (see **Figure 1**).

Figure 1: Existing Intersection Vicinity Map

Data Collection and Traffic Volumes

Turning movement counts were provided by Lewis-Clark Valley Metropolitan Planning Organization (LCVMPO). The counts were performed on Tuesday, September 20, 2016 from 7:00-10:00 AM and 3:00-6:00 PM. The AM Peak Hour was 7:30-8:30 AM and the PM Peak Hour was 4:30-5:30 PM. Turning movement counts are attached to this memo. Turning movement count adjustments and assumptions are summarized below:

- Although the 8th Street, Elm Street & Diagonal Street intersection has six legs, the turning movement count data were collected as though the intersection had four legs, with the north and west legs and south and east legs combined, respectively. Turning movement volumes on the combined legs were assigned to each individual leg according to tube count volumes observed on Elm Street and 8th Street (84 percent to/from Elm Street, 16 percent to/from 8th Street).
- A 1 percent compound annual growth rate was used to forecast 2020 and 2040 volumes from the 2016 counts. The LCVMPO QRS-II travel demand forecasting model predicts lower growth at this intersection (0.2 percent annually); the 1 percent growth rate was used because it is more conservative and is typical for the Lewis-Clark Valley.

Twenty-four (24) hour tube counts were performed on each of the six intersection legs on various days between Monday, November 18 and Tuesday, December 3, 2019. These counts can be viewed in **Attachment C**. Hourly volumes from 7:00AM – 7:00 PM were used to evaluate signal warrants from the Manual on Uniform Traffic Control Devices (MUTCD). Hourly volumes used in the warrant analyses are attached to this memo. Tube count adjustments and assumptions are summarized below:

- The tube count from the southwest leg of the intersection was suspiciously low, and therefore the southwest leg was assumed to have the same volumes as the northeast leg for the purposes of the warrant analyses.
- After making the above correction, the tube count volumes were lower than the turning movement volumes during peak hours, so the tube count volumes were increased by 11 percent to account for the difference.

Crash History

The intersection has seen six (6) crashes recorded by WSDOT between the years of 2012 and 2017, which is also reflected in the Asotin County – City of Clarkston Transportation Plan, which was completed in 2019. The six (6) total crashes are summarized by the following:

- **4 crashes** – No Apparent Injury / Property Damage
- **1 crash** – Possible Injury
- **1 crash** – Suspected Possible Injury

In addition to the WSDOT reported crashes, local crash data was obtained from police reports that were not recorded at the state level. The local crash data included an additional 13 crashes have been reported at or near this intersection between the years 2014 and 2018. The 13 crashes can be summarized by the following:

- **9 crashes** – No Apparent Injury / Property Damage
- **4 crashes** – Potential / Documented Injury

This brings the total number of crashes at or in direct proximity to the study intersection to a total of 19 from the years 2012 to 2018. Out of these 19, six (6) were documented as potential or documented injuries. These numbers are substantial for a community like the City of Clarkston. The only intersections that routinely document more crashes than the 8th Street & Elm Street intersection are the intersections along Bridge Street (US-12), which is

expected due to it being a state route with substantial more traffic. Other intersections along Diagonal Street also experience higher crash rates due to the atypical geometry that the corridor provides.

Level-of-Service Definition

Level of Service (LOS) is a qualitative measure of traffic congestion and delay, ranging from A to F. LOS A represents very low traffic volumes compared to the capacity of the roadway, while LOS F represents traffic demand that exceeds capacity, causing a bottleneck in traffic flow and serious congestion. *LOS D is typically considered the minimum acceptable for average intersection LOS and LOS E (defined as capacity) is the minimum acceptable for worst movements.*

The Highway Capacity Manual (HCM) and Sidra Intersection (SIDRA) analysis methodologies assign LOS to intersections, lanes, and individual turning movements based primarily on vehicle delay. The volume-to-capacity (v/c) ratio[1] is also used, in that a v/c ratio greater than 1.0 represents oversaturated conditions and always results in a LOS F in both the HCM and SIDRA methodologies, regardless of calculated delay. The thresholds for each LOS vary, based on type of intersection control, as shown in **Table 2**.

Table 2: Level of Service Definitions

Level of Service	Average Delay per Vehicle in Seconds (d)		
	Traffic Signal	Roundabout	Stop Control
A	d ≤ 10	d ≤ 10	d ≤ 10
B	10 < d ≤ 20	10 < d ≤ 20	10 < d ≤ 15
C	20 < d ≤ 35	20 < d ≤ 35	15 < d ≤ 25
D	35 < d ≤ 55	35 < d ≤ 50	25 < d ≤ 35
E	55 < d ≤ 80	50 < d ≤ 70	35 < d ≤ 50
F	80 < d **or** v/c > 1.0	70 < d **or** v/c > 1.0	50 < d **or** v/c > 1.0

Signal Warrant Analysis

MUTCD signal warrants were evaluated for the 8th Street & Elm Street intersection using HCS7 software; the analysis output is attached to this memo. The nine MUTCD signal warrants are:

Warrant 1, Eight-Hour Vehicular Volume
Warrant 2, Four-Hour Vehicular Volume
Warrant 3, Peak Hour
Warrant 4, Pedestrian Volume
Warrant 5, School Crossing
Warrant 6, Coordinated Signal System
Warrant 7, Crash Experience
Warrant 8, Roadway Network
Warrant 9, Intersection Near a Grade Crossing

A traffic signal is currently not warranted at the 8th Street & Elm Street intersection. Recent crash history and existing (2020) traffic volumes are too low to meet Warrants 1, 2, 3, 7 and 8. Warrants 5, 6, and 9 do not apply to this location. Hourly pedestrian counts would be required to evaluate Warrant 4, but it is not expected to be warranted given the observed pedestrian traffic at the intersection.

[1] Also referred to as degree of saturation.

Capacity Analysis Software

The 8th Street & Elm Street intersection operations were analyzed using SimTraffic and SIDRA software.

SimTraffic was used to analyze the No Build, All-Way Stop, and Traffic Signal alternatives because neither HCS, Synchro, nor SIDRA are capable of analyzing All-Way Stop intersections with more than four legs. For consistency's sake, the No Build and Traffic Signal alternatives were also analyzed using SimTraffic.

SIDRA is the industry standard software for roundabout analysis and was therefore used to analyze the Compact Peanut Roundabout alternative.

Existing Condition Analysis (2020)

Table 3 and **Table 4** show existing intersection operations for AM and PM peak hours, respectively.

Table 3: Intersection Operations – AM Peak Hour Existing Conditions (2020)

Alternative	Longest Queue (95th Percentile)	Worst Movement		Average Intersection	
		LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Alt #1 – No Build	90 feet (NEB Approach)	LOS B	11.0 (NEB Right)	LOS A	6.2
Alt #2 – All-Way Stop	80 feet (NEB Approach)	LOS A	9.4 (WB Left)	LOS A	6.5
Alt #3 – Traffic Signal	141 feet (NEB Approach)	LOS C	23.6 (EB Thru)	LOS B	18.0
Alt #4 – Compact Peanut Roundabout	31 feet (NEB Approach)	LOS A	9.7 (NB Left)	LOS A	2.4

Table 4: Intersection Operations – PM Peak Hour Existing Conditions (2020)

Alternative	Longest Queue (95th Percentile)	Worst Movement		Average Intersection	
		LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Alt #1 – No Build	126 feet (SWB Approach)	LOS C	22.8 (NB Left)	LOS A	8.2
Alt #2 – All-Way Stop	87 feet (NEB Approach)	LOS B	12.8 (SWB Left)	LOS A	7.7
Alt #3 – Traffic Signal	155 feet (SWB Approach)	LOS C	27.4 (WB Right)	LOS C	20.2
Alt #4 – Compact Peanut Roundabout	37 feet (SWB Approach)	LOS A	9.9 (SB Left)	LOS A	2.5

Alternative #1 – No Build shows that the intersection is currently operating with acceptable level of service during peak hours, and the queues are not long enough to block nearby driveways/accesses or spill back to adjacent intersections. Regarding the three improvement alternatives,

- Converting the intersection to an all-way stop (Alt #2) would slightly improve existing operations overall; Elm Street traffic would be delayed but Diagonal Street traffic would see reduced delay.
- A traffic signal (Alt #3) would likely worsen existing operations because at least four of the six approaches would have a red light at any one time, which is a less-efficient use of green time than typical four-leg intersections with traffic signals.

- A peanut roundabout (Alt #4) would have the best performance, with the lowest delay and shortest queues of the four alternatives.

FUTURE CONDITIONS ANALYSIS

Future Conditions (2040)

Traffic volumes that were collected and analyzed for this project were projected to the year 2040 for the analysis of all alternatives in the future. See the Data Collection and Traffic Volumes section of this memo for a discussion of traffic forecasting methodology and assumptions.

Table 5 and **Table 6** show the projected future intersection operations for AM and PM peak hours, respectively.

Table 5: Intersection Operations – AM Peak Hour Future Conditions (2040)

Alternative	Longest Queue (95th Percentile)	Worst Movement		Average Intersection	
		LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Alt #1 – No Build	90 feet (NEB Approach)	LOS B	10.3 (SB Left)	LOS A	6.3
Alt #2 – All-Way Stop	89 feet (NEB Approach)	LOS B	10.8 (NB Left)	LOS A	7.2
Alt #3 – Traffic Signal	175 feet (NEB Approach)	LOS C	23.3 (EB Right)	LOS C	20.4
Alt #4 – Peanut Roundabout	35 feet (NEB Approach)	LOS A	9.7 (WB Left)	LOS A	2.5

Table 6: Intersection Operations – PM Peak Hour Future Conditions (2040)

Alternative	Longest Queue (95th Percentile)	Worst Movement		Average Intersection	
		LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Alt #1 – No Build	220 feet (SWB Approach)	LOS C	20.5 (SWB Thru)	LOS B	12.2
Alt #2 – All-Way Stop	148 feet (SWB Approach)	LOS B	13.0 (SWB Thru)	LOS B	10.1
Alt #3 – Traffic Signal	222 feet (SWB Approach)	LOS C	25.3 (SWB Thru)	LOS C	22.6
Alt #4 – Peanut Roundabout	49 feet (SWB Approach)	LOS B	10.4 (SB Left)	LOS A	2.7

Alternative #1 – No Build is expected to maintain acceptable level of service out to the year 2040. Queues are expected to be longer than existing, especially during the PM peak hour, and may begin to block access to driveways on Diagonal Street.

All three improvement alternatives are expected to provide acceptable level of service out to 2040. As with the 2020 analysis scenario, Alternative #4 – Peanut Roundabout is expected to have the best performance and Alternative #3 – Traffic Signal is expected to operate worse than the existing configuration, with Alternative #2 – All-Way Stop providing marginal improvements over the existing configuration.

Public Input and Final Recommendation

As part of this project, Keller Associates presented the intersection analysis and alternatives to the City of Clarkston Public Works Committee to solicit input. Based on the analysis for this intersection, the advantages and disadvantages of each of the alternatives are summarized below.

Table 7: Alternatives Summary

ALTERNATIVE	ADVANTAGES	DISADVANTAGES	PLANNING LEVEL COST
Alternative #1 – "Do Nothing	- No up-front costs	- No increased in Pedestrian safety - No improvements to performance - No reduction in crashes	$0
Alternative #2 – All-Way Stop	- Low up-front costs - Increased pedestrian safety - Reduced crashes and crash severity - Low maintenance - Reduced delay for Diagonal Street traffic	- May be confusing for drivers - Increased delay for Elm Street traffic - Minimal overall delay reduction compared to existing	$120,000*
Alternative #3 – Signalized Intersection	N/A; Signal warrants were not met. Signal cannot be installed.		$798,000
Alternative #4 – Compact Peanut Roundabout	- Increased pedestrian safety - Lowest delay and best operation of the four alternatives - Reduced crashes and crash severity - Low maintenance	- High up-front costs - Minor right-of-way acquisition - May confuse drivers until they are adjusted	$711,000

* This cost estimate assumes a seal coat of the entire intersection to provide fresh surface.

The Public Work Committee has been presented with the alternatives listed in this report as well as their advantages and disadvantages. For this intersection, it is the general consensus that the compact peanut roundabout is the best and most sustainable alternative for current traffic and future projections. The all-way stop is the least expensive alternative and should improve safety but will introduce a stop condition for Elm Street traffic; overall it is not expected to solve the current issues of the intersection. The compact peanut roundabout is small, safe, and is expected to operate better than the other alternatives through the year 2040.

Attachment A

Full Size Figures

KELLER ASSOCIATES

J:\209090-006 CLARKSTON 8TH & ELM\C_DESN_CAD\1_FIGURES\FIGURE-1.DWG LAST SAVED: 12/4/2019 9:29 AM PRINTED: 12/4/2019 10:30 AM

PROJECT NO. 209090-006	DRAWN: MC CHECK: SL	CLARKSTON 8TH, ELM, AND DIAGONAL	City of Clarkston
SHEET NO. FIG. 1	PAGE	ALTERNATIVE NO. 1 - NO BUILD	

1-1/2 Inches
VERIFY SCALE: Scales based on 22"x34" prints.

NO.	REVISIONS	DATE

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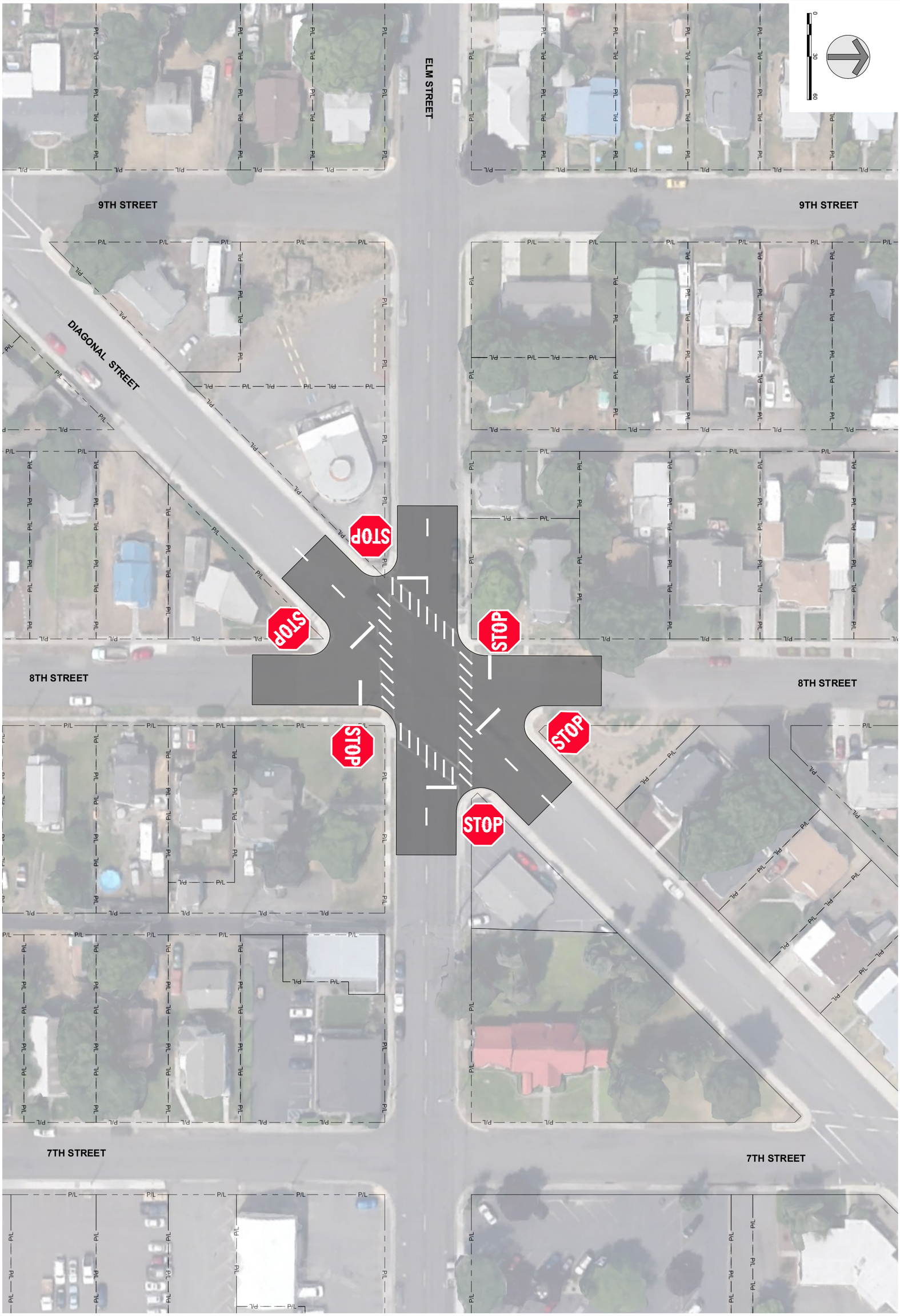

PROJECT NO. 209090-006	DRAWN: MC	CHECK: SL	CLARKSTON 8TH, ELM, AND DIAGONAL
SHEET NO. FIG. 2	PAGE	VERIFY SCALE: Scales based on 22"x34" prints. 1-1/2 Inches	ALTERNATIVE NO. 2 - ALL WAY STOP INTERSECTION

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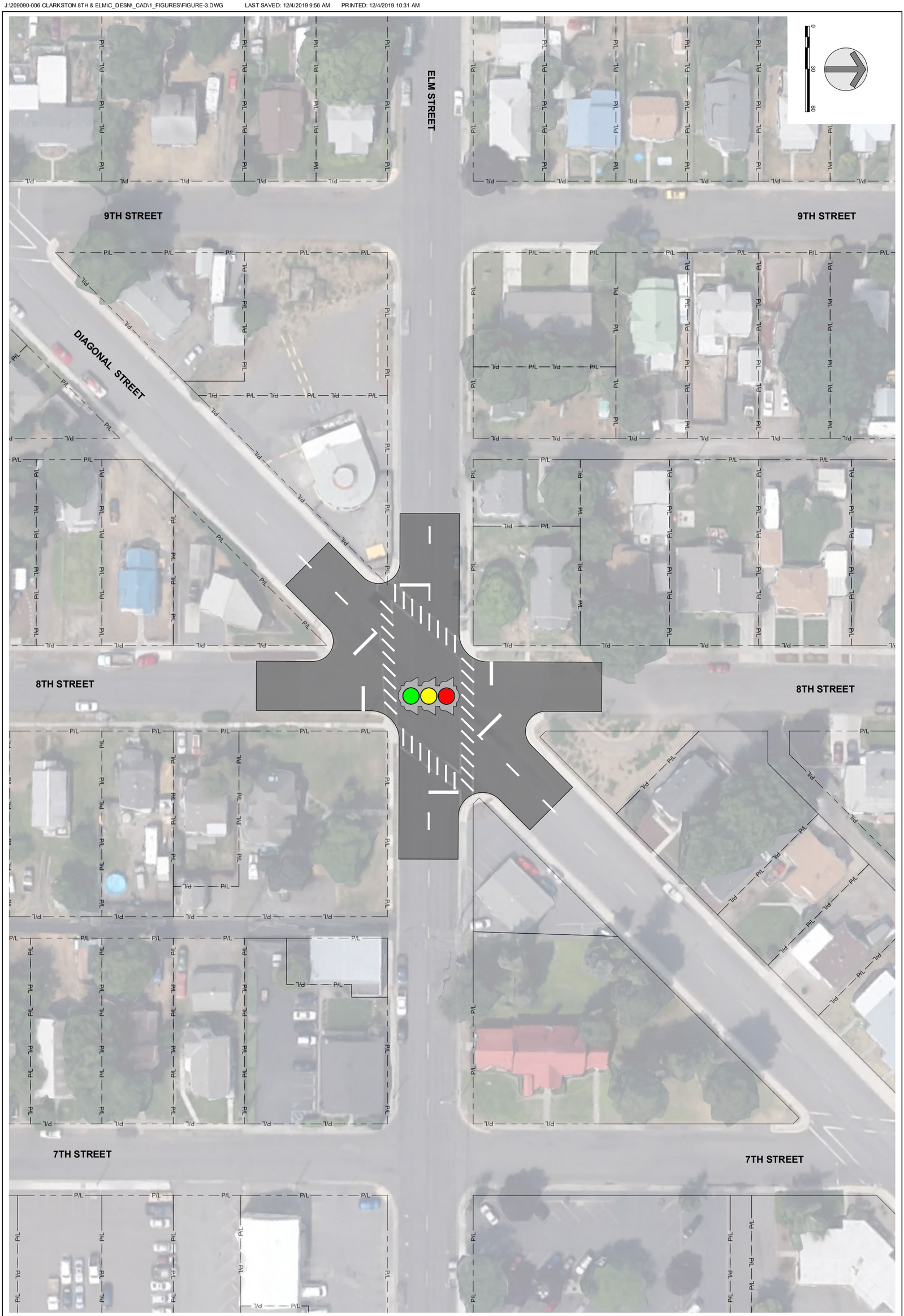
J:\209090-006 CLARKSTON 8TH & ELM\C_DESN_CAD\1_FIGURES\FIGURE-3.DWG LAST SAVED: 12/4/2019 9:56 AM PRINTED: 12/4/2019 10:31 AM



PROJECT NO. 209090-006	PAGE	1:12 Inches	VERIFY SCALE: Scales based on 22"x34" prints.
SHEET NO. FIG. 3			DRAWN: MC CHECK: SL

CLARKSTON 8TH, ELM, AND DIAGONAL

ALTERNATIVE NO. 3 - SIGNALIZED INTERSECTION

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SHEET NO. FIG. 4	PAGE	VERIFY SCALE: Scales based on 22"x34" prints. 1-1/2 Inches	ALTERNATIVE NO. 4 - ROUNDABOUT

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Attachment B

Planning Level Cost Estimates

KELLER ASSOCIATES

COST ESTIMATE

CLARKSTON 8TH, ELM & DIAGONAL STREET INTERSECTION

ALT 1 - DO NOTHING

Opinion of Probable Cost (Major Items)

WSDOT Item #	Item Description	Approx. Quantity	Unit	Unit Price	Bid Price
	BASE BID				
0001	MOBILIZATION	10%	LS	$ -	$0
0025	CLEARING AND GRUBBING	0.0	LS	$ 5,000.00	$0
0050	REMOVING EXISTING STRUCTURE, PEDESTRIAN RAMP	0.0	LS	$ 2,000.00	$0
0050	REMOVING EXISTING STRUCTURE, CURB & GUTTER	0.0	LS	$ 3,000.00	$0
0050	REMOVING EXISTING STRUCTURE, SIDEWALK	0.0	LS	$ 3,000.00	$0
0310	ROADWAY EXCAVATION INCLUDING HAUL	0.0	CY	$ 15.00	$0
5095	CRUSHED SURFACING BASE COURSE	0.0	CY	$ 38.00	$0
5115	CRUSHED SURFACING TOP COURSE	0.0	CY	$ 40.00	$0
5767	HMA CL. 3 IN. PG 64-28	0.0	TON	$ 120.00	$0
6488	EROSION CONTROL AND WATER POLLUTION PREVENTION	0.0	LS	$ 2,500.00	$0
6700	CEMENT CONCRETE TRAFFIC CURB AND GUTTER	0.0	LF	$ 40.00	$0
6856	PAINTED CROSSWALK LINE	0.0	SF	$ 10.00	$0
6858	PAINTED STOP LINE	0.0	LF	$ 7.00	$0
6890	PERMANENT SIGNING	0.0	LS	$ 3,000.00	$0
6971	PROJECT TEMPORARY TRAFFIC CONTROL	0.0	LS	$ 10,000.00	$0
7038	ROADWAY SURVEYING	0.0	LS	$ 2,500.00	$0
7055	5' CEMENT CONRETE SIDEWALK, 4" THICKNESS	0.0	SY	$ 70.00	$0
7058	CEMENT CONC. CURB RAMP TYPE B	0.0	EACH	$ 2,500.00	$0
SP 100	REMOVE AND RESET SIGN, RETAIN STREET SIGN AND POST	0.0	EACH	$ 250.00	$0
SP 101	REMOVE AND RESET SIGN POST, INSTALL STOP SIGN	0.0	EACH	$ 300.00	$0
	CONSTRUCTION SUBTOTAL (Rounded up to the nearest $1,000)				***$0***
	CONSTRUCTION CONTINGENCY, CE&I	20%	LS	$ -	$0
	TOTAL (Rounded up to the nearest $1,000)				***$0***

COST ESTIMATE

CLARKSTON 8TH, ELM & DIAGONAL STREET INTERSECTION

ALT 2 - ALL-WAY STOP

Opinion of Probable Cost (Major Items)

WSDOT Item #	Item Description	Approx. Quantity	Unit	Unit Price	Bid Price
	BASE BID				
0001	MOBILIZATION	10%	LS	$ 5,000.00	$5,000
0025	CLEARING AND GRUBBING	1.0	LS	$ 2,000.00	$2,000
0050	REMOVING EXISTING STRUCTURE, PEDESTRIAN RAMP	6.0	EACH	$ 1,500.00	$9,000
0050	REMOVING EXISTING STRUCTURE, CURB & GUTTER	360.0	LF	$ 15.00	$5,400
0050	REMOVING EXISTING STRUCTURE, SIDEWALK	200.0	SY	$ 10.00	$2,000
6488	EROSION CONTROL AND WATER POLLUTION PREVENTION	1.0	LS	$ 2,500.00	$2,500
6700	CEMENT CONCRETE TRAFFIC CURB AND GUTTER	360.0	LF	$ 40.00	$14,400
6856	PAINTED CROSSWALK LINE	450.0	SF	$ 10.00	$4,500
6858	PAINTED STOP LINE	120.0	LF	$ 7.00	$840
6890	PERMANENT SIGNING	1.0	LS	$ 2,500.00	$2,500
6971	PROJECT TEMPORARY TRAFFIC CONTROL	1.0	LS	$ 5,000.00	$5,000
7038	ROADWAY SURVEYING	1.0	LS	$ 3,000.00	$3,000
7055	5' CEMENT CONRETE SIDEWALK, 4" THICKNESS	200.0	SY	$ 70.00	$14,000
7058	CEMENT CONC. CURB RAMP TYPE B	6.0	EACH	$ 4,000.00	$24,000
SP	SLURRY SEAL	2900.0	SY	$ 2.00	$5,800
	CONSTRUCTION SUBTOTAL (Rounded up to the nearest $1,000)				***$100,000***
	CONSTRUCTION CONTINGENCY, CE&I	20%	LS	$ 20,000	$20,000
	TOTAL (Rounded up to the nearest $1,000)				***$120,000***

COST ESTIMATE

CLARKSTON 8TH, ELM & DIAGONAL STREET INTERSECTION

ALT 3 - SIGNALIZED INTERSECTION

Opinion of Probable Cost (Major Items)

WSDOT Item #	Item Description	Approx. Quantity	Unit	Unit Price	Bid Price
	BASE BID				
0001	MOBILIZATION	10%	LS	$ 60,000.00	$60,000
0025	CLEARING AND GRUBBING	1.0	LS	$ 5,000.00	$5,000
0050	REMOVING EXISTING STRUCTURE, PEDESTRIAN RAMP	6.0	EACH	$ 1,500.00	$9,000
0050	REMOVING EXISTING STRUCTURE, CURB & GUTTER	360.0	LF	$ 15.00	$5,400
0050	REMOVING EXISTING STRUCTURE, SIDEWALK	200.0	SY	$ 30.00	$6,000
6488	EROSION CONTROL AND WATER POLLUTION PREVENTION	1.0	LS	$ 2,500.00	$2,500
6700	CEMENT CONCRETE TRAFFIC CURB AND GUTTER	360.0	LF	$ 40.00	$14,400
6806	PAINT LINE	50.0	LF	$ 10.00	$500
6856	PAINTED CROSSWALK LINE	450.0	SF	$ 4.00	$1,800
6858	PAINTED STOP LINE	120.0	LF	$ 7.00	$840
6890	PERMANENT SIGNING	1.0	LS	$ 3,000.00	$3,000
6912	TRAFFIC SIGNAL SYSTEM	1.0	LS	$ 500,000.00	$500,000
6971	PROJECT TEMPORARY TRAFFIC CONTROL	1.0	LS	$ 10,000.00	$10,000
7038	ROADWAY SURVEYING	1.0	LS	$ 2,500.00	$2,500
7055	5' CEMENT CONRETE SIDEWALK, 4" THICKNESS	200.0	SY	$ 70.00	$14,000
7058	CEMENT CONC. CURB RAMP TYPE B	6.0	EACH	$ 4,000.00	$24,000
SP	SLURRY SEAL	2900.0	SY	$ 2.00	$5,800
	CONSTRUCTION SUBTOTAL *(Rounded up to the nearest $1,000)*				***$665,000***
	CONSTRUCTION CONTINGENCY, CE&I	20%	LS	$ 133,000	$133,000
	TOTAL (Rounded up to the nearest $1,000)				***$798,000***

COST ESTIMATE

CLARKSTON 8TH, ELM & DIAGONAL STREET INTERSECTION

ALTERNATIVE 4 - COMPACT PEANUT ROUNDABOUT

Opinion of Probable Cost (Major Items)

WSDOT Item #	Item Description	Approx. Quantity	Unit	Unit Price	Bid Price
0001	MOBILIZATION	10%	LS	$ 53,800	$53,800
0080	REMOVING BITUMINOUS PAVEMENT	3,200	SY	$ 4.00	$12,800
0100	REMOVING CEMENT CONC. SIDEWALK	150	SY	$ 15.00	$2,250
0110	REMOVING CEMENT CONC. CURB & GUTTER	1,100	LF	$ 6.00	$6,600
0310	ROADWAY EXCAVATION INCL HAUL	1,450	CY	$ 15.00	$21,750
3080	ADJUST MANHOLE	2	EA	$ 900.00	$1,800
5095	CRUSHED SURFACING BASE COURSE	720	CY	$ 38.00	$27,360
5115	CRUSHED SURFACING TOP COURSE	575	CY	$ 40.00	$23,000
312	HMA CL. 1/2 IN. PG 64-28	380	TON	$ 120.00	$45,600
6243	ADJUST VALVE BOX	6	EA	$ 850.00	$5,100
6490	EROSION/WATER POLLUTION CONTROL	1	LS	$ 7,500.00	$7,500
6700	CEMENT CONC. TRAFFIC CURB & GUTTER	1,100	LF	$ 35.00	$38,500
6702	MOUNTABLE CEMENT CONC. TRAFFIC CURB	825	LF	$ 45.00	$37,125
6709	ROUNDABOUT TRUCK APRON CEM. CONC CURB & GUTTER	360	LF	$ 35.00	$12,600
6833	PLASTIC TRAFFIC ARROW	12	EA	$ 150.00	$1,800
6857	PLASTIC CROSSWALK LINE	650	SF	$ 7.00	$4,550
6890	PERMANENT SIGNING	20	EA	$ 500	$10,000
6971	PROJECT TEMPORARY TRAFFIC CONTROL	1	LS	$ 17,500.00	$17,500
6980	FLAGGERS AND SPOTTERS	75	HR	$ 50.00	$3,750
6982	CONSTRUCTION SIGNS CLASS A	320	SF	$ 7.00	$2,240
6992	OTHER TRAFFIC CONTROL LABOR (MAINTENANCE)	120	HR	$ 40.00	$4,800
7038	ROADWAY SURVEYING	1	LS	$ 10,000	$10,000
7055	CEMENT CONCRETE SIDEWALK	150	SY	$ 55.00	$8,250
7058	CEMENT CONC. CURB RAMP TYPE A	18	EA	$ 4,000	$72,000
SP	STORM DRAINAGE MODIFICATIONS	1	LS	$ 20,000	$20,000
SP	LANDSCAPING	1	LS	$ 5,000.00	$5,000
SP	STAMPED CONCRETE (CENTER ISLAND) / BRICK PAVERS	675	SY	$ 120.00	$81,000
SP	RIGHT OF WAY PURCHASE	1,000	SF	$ 55.00	$55,000
	CONSTRUCTION SUBTOTAL (Rounded up to the nearest $1,000)				***$592,000***
	ENVIRONMENTAL	1	LS	$ 30,000	$ 30,000
	CONSTRUCTION CONTINGENCY, CE&I	35%	LS	$ 207,200	$ 207,200
	TOTAL (Rounded up to the nearest $1,000)				***$830,000***

Attachment C

Traffic Volumes

KELLER ASSOCIATES

Asotin County Public Works Traffic Counts

8th St N. of Elm St
Start Date: 11/26/2019
End Date: 12/2/2019

11/26/2019 Time	Direction X, Lane 1	Direction X, Lane 2	Total
12:00 AM	*	*	0
1:00	*	*	0
2:00	*	*	0
3:00	*	*	0
4:00	*	*	0
5:00	*	*	0
6:00	*	*	0
7:00	*	*	0
8:00	*	*	0
9:00	*	*	0
10:00	*	*	0
11:00	*	*	0
12:00 PM	*	*	0
1:00	*	*	0
2:00	*	*	0
3:00	*	*	0
4:00	14	16	30
5:00	15	7	22
6:00	7	8	15
7:00	4	2	6
8:00	4	7	11
9:00	3	5	8
10:00	3	7	10
11:00	2	2	4
Total	52	54	106
Percent	49.1%	50.9%	
AM Peak			
Volume	0	0	0
PM Peak	5:00	4:00	4:00
Volume	15	16	30

Asotin County Public Works Traffic Counts

8th St N. of Elm St
Start Date: 11/26/2019
End Date: 12/2/2019

11/27/2019 Time	Direction X, Lane 1	Direction X, Lane 2	Total
12:00 AM	4	2	6
1:00	2	4	6
2:00	0	0	0
3:00	2	1	3
4:00	0	2	2
5:00	5	2	7
6:00	2	1	3
7:00	5	9	14
8:00	2	10	12
9:00	7	10	17
10:00	7	7	14
11:00	19	11	30
12:00 PM	11	18	29
1:00	8	13	21
2:00	18	17	35
3:00	10	20	30
4:00	9	7	16
5:00	20	12	32
6:00	6	13	19
7:00	9	6	15
8:00	10	4	14
9:00	0	4	4
10:00	3	1	4
11:00	2	1	3
Total	161	175	336
Percent	47.9%	52.1%	
AM Peak	11:00	12:00 PM	11:00
Volume	19	18	30
PM Peak	5:00	3:00	2:00
Volume	20	20	35

Asotin County Public Works Traffic Counts

8th St N. of Elm St
Start Date: 11/26/2019
End Date: 12/2/2019

11/28/2019 Time	Direction X, Lane 1	Direction X, Lane 2	Total
12:00 AM	3	3	6
1:00	0	1	1
2:00	0	1	1
3:00	0	0	0
4:00	0	0	0
5:00	1	2	3
6:00	0	0	0
7:00	4	3	7
8:00	5	8	13
9:00	5	4	9
10:00	10	7	17
11:00	8	7	15
12:00 PM	13	11	24
1:00	8	11	19
2:00	6	6	12
3:00	9	6	15
4:00	11	11	22
5:00	9	9	18
6:00	7	6	13
7:00	6	9	15
8:00	6	7	13
9:00	3	6	9
10:00	2	1	3
11:00	1	2	3
Total	117	121	238
Percent	49.2%	50.8%	
AM Peak	12:00 PM	12:00 PM	12:00 PM
Volume	13	11	24
PM Peak	12:00 PM	12:00 PM	12:00 PM
Volume	13	11	24

Asotin County Public Works Traffic Counts

8th St N. of Elm St
Start Date: 11/26/2019
End Date: 12/2/2019

11/29/2019 Time	Direction X, Lane 1	Direction X, Lane 2	Total
12:00 AM	2	1	3
1:00	1	2	3
2:00	0	1	1
3:00	0	0	0
4:00	2	2	4
5:00	2	3	5
6:00	2	3	5
7:00	3	7	10
8:00	5	8	13
9:00	10	8	18
10:00	9	10	19
11:00	13	9	22
12:00 PM	15	11	26
1:00	7	8	15
2:00	12	12	24
3:00	5	7	12
4:00	11	7	18
5:00	10	7	17
6:00	14	5	19
7:00	8	4	12
8:00	2	2	4
9:00	4	4	8
10:00	3	2	5
11:00	4	4	8
Total	144	127	271
Percent	53.1%	46.9%	
AM Peak	12:00 PM	12:00 PM	12:00 PM
Volume	15	11	26
PM Peak	12:00 PM	2:00	12:00 PM
Volume	15	12	26

Asotin County Public Works Traffic Counts

8th St N. of Elm St
Start Date: 11/26/2019
End Date: 12/2/2019

11/30/2019 Time	Direction X, Lane 1	Direction X, Lane 2	Total
12:00 AM	2	3	5
1:00	1	3	4
2:00	2	1	3
3:00	1	1	2
4:00	0	1	1
5:00	0	1	1
6:00	2	0	2
7:00	1	4	5
8:00	5	4	9
9:00	8	2	10
10:00	4	6	10
11:00	12	8	20
12:00 PM	15	4	19
1:00	13	6	19
2:00	6	9	15
3:00	4	8	12
4:00	8	8	16
5:00	7	3	10
6:00	9	10	19
7:00	9	7	16
8:00	5	7	12
9:00	2	3	5
10:00	2	6	8
11:00	2	0	2
Total	120	105	225
Percent	53.3%	46.7%	
AM Peak	12:00 PM	11:00	11:00
Volume	15	8	20
PM Peak	12:00 PM	6:00	12:00 PM
Volume	15	10	19

Asotin County Public Works Traffic Counts

8th St N. of Elm St
Start Date: 11/26/2019
End Date: 12/2/2019

12/1/2019 Time	Direction X, Lane 1	Direction X, Lane 2	Total
12:00 AM	0	1	1
1:00	1	0	1
2:00	1	0	1
3:00	0	0	0
4:00	0	1	1
5:00	0	1	1
6:00	1	2	3
7:00	1	0	1
8:00	4	1	5
9:00	5	8	13
10:00	4	5	9
11:00	11	7	18
12:00 PM	11	9	20
1:00	4	5	9
2:00	11	2	13
3:00	5	13	18
4:00	10	9	19
5:00	4	4	8
6:00	3	8	11
7:00	5	10	15
8:00	4	5	9
9:00	3	1	4
10:00	5	3	8
11:00	3	4	7
Total	96	99	195
Percent	49.2%	50.8%	
AM Peak	11:00	12:00 PM	12:00 PM
Volume	11	9	20
PM Peak	12:00 PM	3:00	12:00 PM
Volume	11	13	20

Asotin County Public Works Traffic Counts

8th St N. of Elm St
Start Date: 11/26/2019
End Date: 12/2/2019

12/2/2019 Time	Direction X, Lane 1	Direction X, Lane 2	Total
12:00 AM	2	1	3
1:00	4	1	5
2:00	1	1	2
3:00	0	0	0
4:00	0	0	0
5:00	3	2	5
6:00	*	*	0
7:00	*	*	0
8:00	*	*	0
9:00	*	*	0
10:00	*	*	0
11:00	*	*	0
12:00 PM	*	*	0
1:00	*	*	0
2:00	*	*	0
3:00	*	*	0
4:00	*	*	0
5:00	*	*	0
6:00	*	*	0
7:00	*	*	0
8:00	*	*	0
9:00	*	*	0
10:00	*	*	0
11:00	*	*	0
Total	10	5	15
Percent	66.7%	33.3%	
AM Peak	1:00	5:00	1:00
Volume	4	2	5
PM Peak Volume	0	0	0
Grand Total	700	686	1386
Percent	50.5%	49.5%	
ADT	N/A		

Operator/Counter# : JW/ # 291
Reason For Study : Clarkston Counts
Location/ MP : 145 ft S. of Diagonal St

Site: 8th St. S. of Elm St.
Tuesday, 11/26/2019 3:45 PM -
Tuesday, 12/3/2019 10:45 AM

Volume Grand Totals

Average Volumes

	North		South		Combined			North		South		Combined	
12:00 AM	1.0	3.1	1.4	3.9	2.4	7.0	12:00 PM	1.3	7.3	1.5	7.5	2.8	14.8
12:15 AM	1.0		1.1		2.1		12:15 PM	1.7		1.7		3.3	
12:30 AM	0.4		0.3		0.7		12:30 PM	1.8		2.5		4.3	
12:45 AM	0.7		1.0		1.7		12:45 PM	2.5		1.8		4.3	
1:00 AM	1.1	2.4	1.3	2.6	2.4	5.0	1:00 PM	2.8	15.2	1.5	9.8	4.3	25.0
1:15 AM	0.7		0.7		1.4		1:15 PM	4.7		2.8		7.5	
1:30 AM	0.3		0.1		0.4		1:30 PM	3.0		2.7		5.7	
1:45 AM	0.3		0.4		0.7		1:45 PM	4.7		2.8		7.5	
2:00 AM	0.0	1.3	0.1	0.6	0.1	1.9	2:00 PM	1.8	12.0	2.7	9.2	4.5	21.2
2:15 AM	0.4		0.1		0.6		2:15 PM	4.0		2.0		6.0	
2:30 AM	0.1		0.1		0.3		2:30 PM	2.5		2.2		4.7	
2:45 AM	0.7		0.1		0.9		2:45 PM	3.7		2.3		6.0	
3:00 AM	0.0	0.3	0.1	0.9	0.1	1.1	3:00 PM	2.0	10.0	2.7	11.2	4.7	21.2
3:15 AM	0.1		0.3		0.4		3:15 PM	2.5		2.2		4.7	
3:30 AM	0.1		0.4		0.6		3:30 PM	3.7		3.3		7.0	
3:45 AM	0.0		0.0		0.0		3:45 PM	1.9		3.0		4.9	
4:00 AM	0.1	0.9	0.1	0.6	0.3	1.4	4:00 PM	2.7	9.9	1.6	9.0	4.3	18.9
4:15 AM	0.0		0.0		0.0		4:15 PM	3.1		2.3		5.4	
4:30 AM	0.6		0.1		0.7		4:30 PM	1.6		2.3		3.9	
4:45 AM	0.1		0.3		0.4		4:45 PM	2.4		2.9		5.3	
5:00 AM	0.1	0.9	0.1	0.6	0.3	1.4	5:00 PM	1.7	9.7	1.9	12.1	3.6	21.9
5:15 AM	0.6		0.1		0.7		5:15 PM	2.4		3.3		5.7	
5:30 AM	0.1		0.3		0.4		5:30 PM	2.6		3.9		6.4	
5:45 AM	0.0		0.0		0.0		5:45 PM	3.0		3.1		6.1	
6:00 AM	0.3	1.6	0.1	0.6	0.4	2.1	6:00 PM	2.1	10.9	3.7	9.9	5.9	20.7
6:15 AM	0.6		0.3		0.9		6:15 PM	3.7		2.1		5.9	
6:30 AM	0.3		0.0		0.3		6:30 PM	2.4		1.7		4.1	
6:45 AM	0.4		0.1		0.6		6:45 PM	2.6		2.3		4.9	
7:00 AM	0.1	2.7	0.1	1.6	0.3	4.3	7:00 PM	2.4	9.0	3.6	10.3	6.0	19.3
7:15 AM	1.0		0.4		1.4		7:15 PM	3.0		2.7		5.7	
7:30 AM	0.7		0.9		1.6		7:30 PM	1.9		1.6		3.4	
7:45 AM	0.9		0.1		1.0		7:45 PM	1.7		2.4		4.1	
8:00 AM	0.4	1.9	0.3	1.6	0.7	3.4	8:00 PM	1.3	7.9	1.9	7.6	3.1	15.4
8:15 AM	1.1		0.4		1.6		8:15 PM	2.7		2.1		4.9	
8:30 AM	0.1		0.4		0.6		8:30 PM	2.7		2.1		4.9	
8:45 AM	0.1		0.4		0.6		8:45 PM	1.1		1.4		2.6	
9:00 AM	1.6	7.1	0.7	4.6	2.3	11.7	9:00 PM	0.4	5.0	1.6	5.9	2.0	10.9
9:15 AM	1.7		0.9		2.6		9:15 PM	1.3		1.1		2.4	
9:30 AM	1.9		1.0		2.9		9:30 PM	1.9		1.3		3.1	
9:45 AM	2.0		2.0		4.0		9:45 PM	1.4		1.9		3.3	
10:00 AM	1.9	6.7	1.0	4.5	2.9	11.2	10:00 PM	1.3	4.3	1.1	3.7	2.4	8.0
10:15 AM	1.4		1.1		2.6		10:15 PM	1.1		0.9		2.0	
10:30 AM	1.6		0.9		2.4		10:30 PM	1.1		0.9		2.0	
10:45 AM	1.8		1.5		3.3		10:45 PM	0.7		0.9		1.6	
11:00 AM	1.7	7.5	0.8	5.2	2.5	12.7	11:00 PM	1.3	3.7	0.4	2.7	1.7	6.4
11:15 AM	1.5		1.5		3.0		11:15 PM	0.6		1.4		2.0	
11:30 AM	2.2		0.5		2.7		11:30 PM	0.7		0.4		1.1	
11:45 AM	2.2		2.3		4.5		11:45 PM	1.1		0.4		1.6	

	ADT	Total Volume	
North	141.1	936	52.7%
South	125.8	839	47.3%
Combined	266.9	1775	

Asotin County Public Works Traffic Counts

Diagonal St N. of Elm St
Start Date: 11/20/2019
End Date: 11/26/2019

11/20/2019 Time	Direction X, Lane 1	Direction X, Lane 2	Total
12:00 AM	*	*	0
1:00	*	*	0
2:00	*	*	0
3:00	*	*	0
4:00	*	*	0
5:00	*	*	0
6:00	*	*	0
7:00	*	*	0
8:00	*	*	0
9:00	*	*	0
10:00	*	*	0
11:00	*	*	0
12:00 PM	*	*	0
1:00	*	*	0
2:00	*	*	0
3:00	120	174	294
4:00	143	193	336
5:00	157	137	294
6:00	101	104	205
7:00	83	88	171
8:00	48	42	90
9:00	29	28	57
10:00	21	26	47
11:00	15	11	26
Total	717	803	1520
Percent	47.2%	52.8%	
AM Peak Volume	0	0	0
PM Peak Volume	5:00 157	4:00 193	4:00 336

Asotin County Public Works Traffic Counts

Diagonal St N. of Elm St
Start Date: 11/20/2019
End Date: 11/26/2019

11/21/2019 Time	Direction X, Lane 1	Direction X, Lane 2	Total
12:00 AM	14	7	21
1:00	7	3	10
2:00	5	4	9
3:00	0	3	3
4:00	3	16	19
5:00	12	33	45
6:00	21	66	87
7:00	58	132	190
8:00	61	148	209
9:00	67	140	207
10:00	100	143	243
11:00	127	156	283
12:00 PM	149	178	327
1:00	109	163	272
2:00	114	163	277
3:00	128	151	279
4:00	124	167	291
5:00	148	165	313
6:00	96	127	223
7:00	68	71	139
8:00	40	55	95
9:00	36	24	60
10:00	18	20	38
11:00	14	13	27
Total	1519	2148	3667
Percent	41.4%	58.6%	
AM Peak	12:00 PM	12:00 PM	12:00 PM
Volume	149	178	327
PM Peak	12:00 PM	12:00 PM	12:00 PM
Volume	149	178	327

Asotin County Public Works Traffic Counts

Diagonal St N. of Elm St
Start Date: 11/20/2019
End Date: 11/26/2019

11/22/2019 Time	Direction X, Lane 1	Direction X, Lane 2	Total
12:00 AM	12	10	22
1:00	5	9	14
2:00	12	4	16
3:00	3	6	9
4:00	3	18	21
5:00	13	26	39
6:00	18	74	92
7:00	58	146	204
8:00	75	129	204
9:00	89	145	234
10:00	108	143	251
11:00	127	171	298
12:00 PM	132	180	312
1:00	136	186	322
2:00	154	181	335
3:00	142	184	326
4:00	161	167	328
5:00	154	163	317
6:00	100	128	228
7:00	67	80	147
8:00	63	55	118
9:00	43	32	75
10:00	25	24	49
11:00	21	18	39
Total	1721	2279	4000
Percent	43.0%	57.0%	
AM Peak	12:00 PM	12:00 PM	12:00 PM
Volume	132	180	312
PM Peak	4:00	1:00	2:00
Volume	161	186	335

Asotin County Public Works Traffic Counts

Diagonal St N. of Elm St
Start Date: 11/20/2019
End Date: 11/26/2019

11/23/2019 Time	Direction X, Lane 1	Direction X, Lane 2	Total
12:00 AM	12	5	17
1:00	9	7	16
2:00	7	8	15
3:00	5	4	9
4:00	3	10	13
5:00	14	16	30
6:00	7	21	28
7:00	21	53	74
8:00	41	84	125
9:00	65	100	165
10:00	108	142	250
11:00	107	141	248
12:00 PM	103	171	274
1:00	118	179	297
2:00	106	122	228
3:00	131	127	258
4:00	101	154	255
5:00	106	127	233
6:00	87	86	173
7:00	71	78	149
8:00	64	60	124
9:00	49	26	75
10:00	23	23	46
11:00	19	11	30
Total	1377	1755	3132
Percent	44.0%	56.0%	
AM Peak	10:00	12:00 PM	12:00 PM
Volume	108	171	274
PM Peak	3:00	1:00	1:00
Volume	131	179	297

Asotin County Public Works Traffic Counts

Diagonal St N. of Elm St
Start Date: 11/20/2019
End Date: 11/26/2019

11/24/2019 Time	Direction X, Lane 1	Direction X, Lane 2	Total
12:00 AM	14	19	33
1:00	10	7	17
2:00	5	5	10
3:00	4	6	10
4:00	5	8	13
5:00	3	14	17
6:00	6	21	27
7:00	27	27	54
8:00	49	66	115
9:00	67	101	168
10:00	68	137	205
11:00	79	115	194
12:00 PM	89	117	206
1:00	67	128	195
2:00	78	108	186
3:00	93	98	191
4:00	83	114	197
5:00	97	100	197
6:00	54	63	117
7:00	57	71	128
8:00	43	47	90
9:00	27	27	54
10:00	23	26	49
11:00	18	11	29
Total	1066	1436	2502
Percent	42.6%	57.4%	
AM Peak	12:00 PM	10:00	12:00 PM
Volume	89	137	206
PM Peak	5:00	1:00	12:00 PM
Volume	97	128	206

Asotin County Public Works Traffic Counts

Diagonal St N. of Elm St
Start Date: 11/20/2019
End Date: 11/26/2019

11/25/2019 Time	Direction X, Lane 1	Direction X, Lane 2	Total
12:00 AM	11	6	17
1:00	5	2	7
2:00	6	3	9
3:00	1	11	12
4:00	5	18	23
5:00	10	28	38
6:00	26	70	96
7:00	52	155	207
8:00	57	152	209
9:00	73	170	243
10:00	124	150	274
11:00	135	179	314
12:00 PM	154	187	341
1:00	119	194	313
2:00	126	184	310
3:00	138	163	301
4:00	144	170	314
5:00	134	122	256
6:00	84	94	178
7:00	76	71	147
8:00	51	36	87
9:00	36	21	57
10:00	21	23	44
11:00	15	8	23
Total	1603	2217	3820
Percent	42.0%	58.0%	
AM Peak	12:00 PM	12:00 PM	12:00 PM
Volume	154	187	341
PM Peak	12:00 PM	1:00	12:00 PM
Volume	154	194	341

Asotin County Public Works Traffic Counts

Diagonal St N. of Elm St
Start Date: 11/20/2019
End Date: 11/26/2019

11/26/2019 Time	Direction X, Lane 1	Direction X, Lane 2	Total
12:00 AM	5	9	14
1:00	12	5	17
2:00	7	5	12
3:00	2	9	11
4:00	4	16	20
5:00	10	38	48
6:00	12	70	82
7:00	43	147	190
8:00	61	143	204
9:00	90	154	244
10:00	98	155	253
11:00	112	176	288
12:00 PM	135	167	302
1:00	117	161	278
2:00	*	*	0
3:00	*	*	0
4:00	*	*	0
5:00	*	*	0
6:00	*	*	0
7:00	*	*	0
8:00	*	*	0
9:00	*	*	0
10:00	*	*	0
11:00	*	*	0
Total	708	1255	1963
Percent	36.1%	63.9%	
AM Peak	12:00 PM	11:00	12:00 PM
Volume	135	176	302
PM Peak	12:00 PM	12:00 PM	12:00 PM
Volume	135	167	302
Grand Total	8711	11893	20604
Percent	42.3%	57.7%	
ADT	N/A		

Asotin County Public Works Traffic Counts

Diagonal St SW. of Elm St
Start Date: 11/14/2018
End Date: 11/20/2018

11/14/2018					
Time	, A	, B	, C	, D	Total
12:00 AM	*	*	*	*	0
1:00	*	*	*	*	0
2:00	*	*	*	*	0
3:00	*	*	*	*	0
4:00	*	*	*	*	0
5:00	*	*	*	*	0
6:00	*	*	*	*	0
7:00	*	*	*	*	0
8:00	*	*	*	*	0
9:00	*	*	*	*	0
10:00	*	*	*	*	0
11:00	*	*	*	*	0
12:00 PM	*	*	*	*	0
1:00	*	*	*	*	0
2:00	*	*	*	*	0
3:00	22	35	0	0	57
4:00	21	44	0	0	65
5:00	18	28	0	0	46
6:00	8	17	0	0	25
7:00	9	15	0	0	24
8:00	13	8	0	0	21
9:00	3	2	0	0	5
10:00	1	1	0	0	2
11:00	0	1	0	0	1
Total	95	151	0	0	246
Percent	38.6%	61.4%	0.0%	0.0%	
AM Peak					
Volume	0	0	0	0	0
PM Peak	3:00	4:00			4:00
Volume	22	44	0	0	65

Asotin County Public Works Traffic Counts

Diagonal St SW. of Elm St
Start Date: 11/14/2018
End Date: 11/20/2018

11/15/2018					
Time	, A	, B	, C	, D	Total
12:00 AM	0	0	0	0	0
1:00	1	1	0	0	2
2:00	0	1	0	0	1
3:00	0	0	0	0	0
4:00	0	1	0	0	1
5:00	4	4	0	0	8
6:00	3	4	0	0	7
7:00	6	17	0	0	23
8:00	14	27	0	0	41
9:00	10	28	0	0	38
10:00	16	27	0	0	43
11:00	15	31	0	0	46
12:00 PM	12	21	0	0	33
1:00	13	31	0	0	44
2:00	16	28	0	0	44
3:00	19	48	0	0	67
4:00	19	42	0	0	61
5:00	19	24	0	0	43
6:00	11	17	0	0	28
7:00	12	13	0	0	25
8:00	9	9	0	0	18
9:00	4	10	0	0	14
10:00	4	5	0	0	9
11:00	1	1	0	0	2
Total	208	390	0	0	598
Percent	34.8%	65.2%	0.0%	0.0%	
AM Peak	10:00	11:00			11:00
Volume	16	31	0	0	46
PM Peak	3:00	3:00			3:00
Volume	19	48	0	0	67

Asotin County Public Works Traffic Counts

Diagonal St SW. of Elm St
Start Date: 11/14/2018
End Date: 11/20/2018

11/16/2018					
Time	, A	, B	, C	, D	Total
12:00 AM	4	1	0	0	5
1:00	0	0	0	0	0
2:00	1	0	0	0	1
3:00	0	0	0	0	0
4:00	1	1	0	0	2
5:00	3	5	0	0	8
6:00	2	6	0	0	8
7:00	5	18	0	0	23
8:00	17	22	0	0	39
9:00	13	29	0	0	42
10:00	22	47	0	0	69
11:00	18	34	0	0	52
12:00 PM	19	29	0	0	48
1:00	22	31	0	0	53
2:00	18	22	0	0	40
3:00	26	41	0	0	67
4:00	20	25	0	0	45
5:00	19	26	0	0	45
6:00	8	25	0	0	33
7:00	8	12	0	0	20
8:00	7	11	0	0	18
9:00	3	17	0	0	20
10:00	5	4	0	0	9
11:00	2	1	0	0	3
Total	243	407	0	0	650
Percent	37.4%	62.6%	0.0%	0.0%	
AM Peak	10:00	10:00			10:00
Volume	22	47	0	0	69
PM Peak	3:00	3:00			3:00
Volume	26	41	0	0	67

Asotin County Public Works Traffic Counts

Diagonal St SW. of Elm St
Start Date: 11/14/2018
End Date: 11/20/2018

11/17/2018					
Time	, A	, B	, C	, D	Total
12:00 AM	1	0	0	0	1
1:00	0	1	0	0	1
2:00	0	0	0	0	0
3:00	1	0	0	0	1
4:00	1	1	0	0	2
5:00	3	3	0	0	6
6:00	4	3	0	0	7
7:00	9	11	0	0	20
8:00	18	28	0	0	46
9:00	22	32	0	0	54
10:00	13	29	0	0	42
11:00	16	29	0	0	45
12:00 PM	15	25	0	0	40
1:00	18	34	0	0	52
2:00	22	39	0	0	61
3:00	21	44	0	0	65
4:00	12	26	0	0	38
5:00	14	16	0	0	30
6:00	14	10	0	0	24
7:00	6	16	0	0	22
8:00	4	6	0	0	10
9:00	5	5	0	0	10
10:00	12	7	0	0	19
11:00	4	2	0	0	6
Total	235	367	0	0	602
Percent	39.0%	61.0%	0.0%	0.0%	
AM Peak	9:00	9:00			9:00
Volume	22	32	0	0	54
PM Peak	2:00	3:00			3:00
Volume	22	44	0	0	65

Asotin County Public Works Traffic Counts

Diagonal St SW. of Elm St
Start Date: 11/14/2018
End Date: 11/20/2018

11/18/2018					
Time	, A	, B	, C	, D	Total
12:00 AM	2	2	0	0	4
1:00	1	1	0	0	2
2:00	0	1	0	0	1
3:00	0	0	0	0	0
4:00	0	0	0	0	0
5:00	4	4	0	0	8
6:00	3	3	0	0	6
7:00	5	9	0	0	14
8:00	3	11	0	0	14
9:00	11	29	0	0	40
10:00	13	26	0	0	39
11:00	17	21	0	0	38
12:00 PM	17	35	0	0	52
1:00	17	31	0	0	48
2:00	20	35	0	0	55
3:00	10	22	0	0	32
4:00	21	42	0	0	63
5:00	16	23	0	0	39
6:00	5	11	0	0	16
7:00	6	12	0	0	18
8:00	7	8	0	0	15
9:00	3	4	0	0	7
10:00	3	3	0	0	6
11:00	0	0	0	0	0
Total	184	333	0	0	517
Percent	35.6%	64.4%	0.0%	0.0%	
AM Peak	11:00	12:00 PM			12:00 PM
Volume	17	35	0	0	52
PM Peak	4:00	4:00			4:00
Volume	21	42	0	0	63

Asotin County Public Works Traffic Counts

Diagonal St SW. of Elm St
Start Date: 11/14/2018
End Date: 11/20/2018

11/19/2018					
Time	, A	, B	, C	, D	Total
12:00 AM	0	0	0	0	0
1:00	0	0	0	0	0
2:00	0	1	0	0	1
3:00	1	0	0	0	1
4:00	0	1	0	0	1
5:00	8	4	0	0	12
6:00	2	7	0	0	9
7:00	7	16	0	0	23
8:00	17	21	0	0	38
9:00	16	32	0	0	48
10:00	10	34	0	0	44
11:00	17	28	0	0	45
12:00 PM	19	32	0	0	51
1:00	13	25	0	0	38
2:00	23	29	0	0	52
3:00	20	35	0	0	55
4:00	21	32	0	0	53
5:00	13	25	0	0	38
6:00	11	11	0	0	22
7:00	5	10	0	0	15
8:00	4	17	0	0	21
9:00	4	4	0	0	8
10:00	0	1	0	0	1
11:00	1	1	0	0	2
Total	212	366	0	0	578
Percent	36.7%	63.3%	0.0%	0.0%	
AM Peak	12:00 PM	10:00			12:00 PM
Volume	19	34	0	0	51
PM Peak	2:00	3:00			3:00
Volume	23	35	0	0	55

Asotin County Public Works Traffic Counts

Diagonal St SW. of Elm St
Start Date: 11/14/2018
End Date: 11/20/2018

11/20/2018					
Time	, A	, B	, C	, D	Total
12:00 AM	0	0	0	0	0
1:00	0	0	0	0	0
2:00	0	0	0	0	0
3:00	0	0	0	0	0
4:00	0	1	0	0	1
5:00	4	6	0	0	10
6:00	3	5	0	0	8
7:00	8	17	0	0	25
8:00	16	33	0	0	49
9:00	18	39	0	0	57
10:00	16	31	0	0	47
11:00	16	25	0	0	41
12:00 PM	10	29	0	0	39
1:00	14	41	0	0	55
2:00	17	37	0	0	54
3:00	24	36	0	0	60
4:00	25	27	0	0	52
5:00	14	22	0	0	36
6:00	*	*	*	*	0
7:00	*	*	*	*	0
8:00	*	*	*	*	0
9:00	*	*	*	*	0
10:00	*	*	*	*	0
11:00	*	*	*	*	0
Total	185	349	0	0	534
Percent	34.6%	65.4%	0.0%	0.0%	
AM Peak	9:00	9:00			9:00
Volume	18	39	0	0	57
PM Peak	4:00	1:00			3:00
Volume	25	41	0	0	60
Grand Total	1362	2363	0	0	3725
Percent	36.6%	63.4%	0.0%	0.0%	
ADT	N/A				

Operator/Counter# : JW / #288
Reason For Study : Clarkston Counts
Location/ MP : 162 ft West of 7th St

Site: Elm St E. of 8th St
Monday, 11/18/2019 5:00 PM -
Tuesday, 11/26/2019 3:15 PM

Volume Grand Totals

Average Volumes

	West		East		Combined			West		East		Combined	
12:00 AM	0.6	4.5	1.8	5.8	2.4	10.3	12:00 PM	10.6	56.1	11.9	56.9	22.5	113.0
12:15 AM	1.4		2.3		3.6		12:15 PM	15.5		13.9		29.4	
12:30 AM	1.5		0.8		2.3		12:30 PM	15.5		14.4		29.9	
12:45 AM	1.0		1.0		2.0		12:45 PM	14.5		16.8		31.3	
1:00 AM	1.4	4.5	0.9	2.5	2.3	7.0	1:00 PM	15.0	71.6	16.1	58.9	31.1	130.5
1:15 AM	0.8		0.5		1.3		1:15 PM	19.3		13.5		32.8	
1:30 AM	1.5		0.6		2.1		1:30 PM	21.5		15.1		36.6	
1:45 AM	0.9		0.5		1.4		1:45 PM	15.9		14.1		30.0	
2:00 AM	0.6	2.5	0.6	1.5	1.3	4.0	2:00 PM	18.6	67.8	15.8	60.6	34.4	128.4
2:15 AM	1.4		0.3		1.6		2:15 PM	18.9		17.3		36.1	
2:30 AM	0.1		0.4		0.5		2:30 PM	14.6		14.0		28.6	
2:45 AM	0.4		0.3		0.6		2:45 PM	15.6		13.6		29.3	
3:00 AM	0.1	1.6	0.3	1.0	0.4	2.6	3:00 PM	12.3	59.8	14.6	52.2	26.9	112.0
3:15 AM	0.5		0.3		0.8		3:15 PM	15.9		13.9		29.7	
3:30 AM	0.4		0.3		0.6		3:30 PM	15.7		12.7		28.4	
3:45 AM	0.6		0.3		0.9		3:45 PM	16.0		11.0		27.0	
4:00 AM	0.9	1.4	0.4	1.5	1.3	2.9	4:00 PM	17.7	77.6	19.3	59.9	37.0	137.4
4:15 AM	0.0		0.3		0.3		4:15 PM	23.4		15.1		38.6	
4:30 AM	0.4		0.3		0.6		4:30 PM	19.6		12.3		31.9	
4:45 AM	0.1		0.6		0.8		4:45 PM	16.9		13.1		30.0	
5:00 AM	0.0	1.4	0.4	3.3	0.4	4.6	5:00 PM	16.4	70.3	16.0	60.4	32.4	130.6
5:15 AM	0.6		0.4		1.0		5:15 PM	20.0		15.0		35.0	
5:30 AM	0.3		1.3		1.5		5:30 PM	16.4		14.4		30.8	
5:45 AM	0.5		1.3		1.8		5:45 PM	17.5		15.0		32.5	
6:00 AM	0.1	1.5	1.3	4.9	1.4	6.4	6:00 PM	18.6	87.1	12.1	48.6	30.8	135.8
6:15 AM	0.3		1.8		2.0		6:15 PM	19.4		14.8		34.1	
6:30 AM	0.6		1.0		1.6		6:30 PM	27.4		11.0		38.4	
6:45 AM	0.5		0.9		1.4		6:45 PM	21.8		10.8		32.5	
7:00 AM	1.5	8.5	1.1	5.9	2.6	14.4	7:00 PM	16.1	54.6	10.8	35.4	26.9	90.0
7:15 AM	2.1		1.3		3.4		7:15 PM	15.3		10.4		25.6	
7:30 AM	2.4		1.4		3.8		7:30 PM	13.0		7.5		20.5	
7:45 AM	2.5		2.1		4.6		7:45 PM	10.3		6.8		17.0	
8:00 AM	1.9	11.1	3.4	16.8	5.3	27.9	8:00 PM	11.4	35.3	9.8	28.8	21.1	64.0
8:15 AM	2.8		2.8		5.5		8:15 PM	10.5		8.5		19.0	
8:30 AM	3.1		4.8		7.9		8:30 PM	8.1		5.1		13.3	
8:45 AM	3.4		5.9		9.3		8:45 PM	5.3		5.4		10.6	
9:00 AM	8.5	34.8	10.3	53.9	18.8	88.6	9:00 PM	7.5	26.0	6.9	23.0	14.4	49.0
9:15 AM	11.3		20.9		32.1		9:15 PM	6.4		5.3		11.6	
9:30 AM	6.9		12.8		19.6		9:30 PM	6.9		6.0		12.9	
9:45 AM	8.1		10.0		18.1		9:45 PM	5.3		4.9		10.1	
10:00 AM	6.9	41.6	9.9	40.5	16.8	82.1	10:00 PM	7.8	21.1	3.9	14.4	11.6	35.5
10:15 AM	11.3		9.9		21.1		10:15 PM	5.3		4.4		9.6	
10:30 AM	10.8		11.6		22.4		10:30 PM	4.0		3.9		7.9	
10:45 AM	12.8		9.1		21.9		10:45 PM	4.1		2.3		6.4	
11:00 AM	10.5	44.4	11.8	48.9	22.3	93.3	11:00 PM	3.6	12.4	3.3	10.1	6.9	22.5
11:15 AM	10.3		13.4		23.6		11:15 PM	2.8		1.9		4.6	
11:30 AM	12.0		12.4		24.4		11:30 PM	3.3		3.0		6.3	
11:45 AM	11.6		11.4		23.0		11:45 PM	2.8		2.0		4.8	

	ADT	Total Volume	
West	797.4	6254	53.4%
East	695.3	5465	46.6%
Combined	1492.7	11719	

Operator/Counter# : JW/ # 287
Reason For Study : Clarkston Counts
Location/ MP : 60' E. of 9th Ave

Site: Elm St W. of 8th St
Monday, 11/18/2019 4:15 PM -
Tuesday, 12/3/2019 10:15 AM

Volume Grand Totals

Average Volumes

	West		East		Combined			West		East		Combined	
12:00 AM	2.1	7.9	1.7	5.7	3.9	13.5	12:00 PM	15.6	65.6	18.9	81.4	34.4	147.0
12:15 AM	1.8		1.4		3.2		12:15 PM	14.9		19.8		34.7	
12:30 AM	1.5		1.2		2.7		12:30 PM	16.7		22.9		39.6	
12:45 AM	2.5		1.3		3.8		12:45 PM	18.4		19.9		38.3	
1:00 AM	2.3	6.3	1.1	4.1	3.3	10.3	1:00 PM	22.5	76.1	21.4	84.6	43.9	160.6
1:15 AM	1.5		1.2		2.7		1:15 PM	18.4		18.2		36.6	
1:30 AM	1.3		1.1		2.4		1:30 PM	18.0		22.0		40.0	
1:45 AM	1.2		0.7		1.9		1:45 PM	17.2		22.9		40.1	
2:00 AM	0.7	3.1	0.7	3.9	1.4	6.9	2:00 PM	16.6	62.4	20.3	75.9	36.9	138.2
2:15 AM	0.7		1.4		2.1		2:15 PM	16.0		18.9		34.9	
2:30 AM	0.5		0.7		1.2		2:30 PM	14.0		18.4		32.4	
2:45 AM	1.1		1.1		2.2		2:45 PM	15.8		18.2		34.0	
3:00 AM	0.6	3.2	0.3	1.7	0.9	4.9	3:00 PM	16.4	70.7	17.3	73.3	33.6	144.0
3:15 AM	1.1		0.8		1.9		3:15 PM	17.0		15.9		32.9	
3:30 AM	0.9		0.4		1.3		3:30 PM	16.0		21.3		37.3	
3:45 AM	0.7		0.1		0.8		3:45 PM	21.4		18.9		40.2	
4:00 AM	0.8	2.1	0.5	2.9	1.3	5.1	4:00 PM	18.1	69.7	16.7	69.7	34.9	139.4
4:15 AM	0.4		0.5		0.9		4:15 PM	17.9		16.8		34.7	
4:30 AM	0.3		1.1		1.4		4:30 PM	16.5		19.1		35.5	
4:45 AM	0.6		0.9		1.5		4:45 PM	17.2		17.1		34.3	
5:00 AM	0.3	1.8	1.0	6.7	1.3	8.5	5:00 PM	17.8	71.4	19.7	81.8	37.5	153.2
5:15 AM	0.7		2.2		2.9		5:15 PM	16.4		19.9		36.3	
5:30 AM	0.1		1.9		2.0		5:30 PM	18.5		20.6		39.1	
5:45 AM	0.7		1.7		2.3		5:45 PM	18.7		21.7		40.3	
6:00 AM	0.8	5.2	1.5	9.6	2.3	14.8	6:00 PM	23.7	73.9	16.5	62.5	40.2	136.5
6:15 AM	0.9		1.9		2.8		6:15 PM	20.7		15.7		36.3	
6:30 AM	1.7		2.2		3.9		6:30 PM	15.4		15.1		30.5	
6:45 AM	1.9		4.0		5.9		6:45 PM	14.1		15.3		29.4	
7:00 AM	2.7	9.3	3.2	18.8	5.9	28.1	7:00 PM	16.9	54.1	10.7	47.0	27.6	101.1
7:15 AM	2.1		4.2		6.3		7:15 PM	12.1		10.9		22.9	
7:30 AM	2.5		5.1		7.5		7:30 PM	13.3		13.6		26.9	
7:45 AM	1.9		6.3		8.3		7:45 PM	11.8		11.9		23.7	
8:00 AM	2.8	24.3	6.3	45.3	9.1	69.6	8:00 PM	10.3	37.1	9.5	33.4	19.8	70.5
8:15 AM	4.3		6.9		11.3		8:15 PM	9.3		7.5		16.9	
8:30 AM	7.4		12.3		19.7		8:30 PM	9.7		8.5		18.3	
8:45 AM	9.7		19.9		29.6		8:45 PM	7.7		7.9		15.6	
9:00 AM	7.5	30.3	18.0	61.3	25.5	91.7	9:00 PM	7.9	29.1	6.0	24.4	13.9	53.5
9:15 AM	7.8		13.3		21.1		9:15 PM	6.1		7.4		13.5	
9:30 AM	6.4		13.5		19.9		9:30 PM	7.7		5.3		13.0	
9:45 AM	8.7		16.6		25.3		9:45 PM	7.4		5.7		13.1	
10:00 AM	10.1	44.5	14.9	64.6	25.0	109.1	10:00 PM	5.7	19.7	5.4	16.5	11.1	36.1
10:15 AM	10.9		13.9		24.7		10:15 PM	4.7		3.3		8.0	
10:30 AM	14.0		17.1		31.1		10:30 PM	4.5		4.5		9.0	
10:45 AM	9.5		18.7		28.2		10:45 PM	4.7		3.3		8.1	
11:00 AM	12.6	52.1	19.1	71.0	31.8	123.1	11:00 PM	3.8	12.0	3.8	12.3	7.6	24.3
11:15 AM	13.9		15.4		29.3		11:15 PM	3.3		2.8		6.1	
11:30 AM	13.0		18.1		31.1		11:30 PM	2.7		2.9		5.5	
11:45 AM	12.5		18.4		30.9		11:45 PM	2.2		2.9		5.1	

	ADT	Total Volume	
West	831.7	12096	46.5%
East	958.3	13922	53.5%
Combined	1790.0	26018	

Attachment D

Capacity Analysis

KELLER ASSOCIATES

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	7:15	7:15	7:15	7:15	7:15	7:15
Total Time (min)	18	18	18	18	18	18
Time Recorded (min)	15	15	15	15	15	15
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	118	124	145	105	116	118
Vehs Exited	115	122	137	104	113	119
Starting Vehs	8	6	4	7	9	6
Ending Vehs	11	8	12	8	12	9
Travel Distance (mi)	44	47	54	39	44	46
Travel Time (hr)	2.1	2.2	2.5	1.8	2.1	2.1
Total Delay (hr)	0.3	0.3	0.3	0.2	0.3	0.3
Total Stops	83	95	108	78	88	87
Fuel Used (gal)	1.5	1.6	1.8	1.3	1.5	1.6

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	118	124	145	105	116	118
Vehs Exited	115	122	137	104	113	119
Starting Vehs	8	6	4	7	9	6
Ending Vehs	11	8	12	8	12	9
Travel Distance (mi)	44	47	54	39	44	46
Travel Time (hr)	2.1	2.2	2.5	1.8	2.1	2.1
Total Delay (hr)	0.3	0.3	0.3	0.2	0.3	0.3
Total Stops	83	95	108	78	88	87
Fuel Used (gal)	1.5	1.6	1.8	1.3	1.5	1.6

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	SBL
Denied Del/Veh (s)	0.1	0.2	0.1	0.1	0.1	0.1	0.1		0.1			0.1
Total Del/Veh (s)	3.1	1.0	1.0	3.2	0.7	1.6	0.1		7.7			8.6

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	SBR	SBR2	NEL	NET	NER	NER2	SWT	SWR	SWR2	All
Denied Del/Veh (s)				0.2	0.2	0.1	0.2	0.1	0.1	0.2
Total Del/Veh (s)				8.1	5.6	11.0	8.1	5.0	10.4	6.2

Total Network Performance

Denied Del/Veh (s)	0.2
Total Del/Veh (s)	7.1

Intersection: 1: Diagonal Street & 8th Street & Elm Street

Movement	EB	WB	NB	SB	NE	SW
Directions Served	<LTR>	<LTR>	<LTR>	<LTR>	<LTR>	<LTR>
Maximum Queue (ft)	34	24	11	11	88	74
Average Queue (ft)	12	5	3	3	58	42
95th Queue (ft)	36	22	10	10	90	71
Link Distance (ft)	1038	1051	822	875	989	847
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	7:15	7:15	7:15	7:15	7:15	7:15
Total Time (min)	18	18	18	18	18	18
Time Recorded (min)	15	15	15	15	15	15
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	121	122	139	105	108	118
Vehs Exited	123	111	131	107	106	116
Starting Vehs	8	3	7	8	7	5
Ending Vehs	6	14	15	6	9	8
Travel Distance (mi)	47	44	52	40	41	45
Travel Time (hr)	2.2	2.1	2.5	1.9	2.0	2.1
Total Delay (hr)	0.3	0.3	0.4	0.2	0.2	0.3
Total Stops	124	115	140	105	107	118
Fuel Used (gal)	1.7	1.6	1.8	1.3	1.4	1.5

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	121	122	139	105	108	118
Vehs Exited	123	111	131	107	106	116
Starting Vehs	8	3	7	8	7	5
Ending Vehs	6	14	15	6	9	8
Travel Distance (mi)	47	44	52	40	41	45
Travel Time (hr)	2.2	2.1	2.5	1.9	2.0	2.1
Total Delay (hr)	0.3	0.3	0.4	0.2	0.2	0.3
Total Stops	124	115	140	105	107	118
Fuel Used (gal)	1.7	1.6	1.8	1.3	1.4	1.5

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	WBR2	NBL2	NBL	NBR2	SBL
Denied Del/Veh (s)	0.1	0.1	0.2		0.4	0.1	0.1	0.1		0.1		0.1
Total Del/Veh (s)	6.7	7.0	4.6		9.4	6.1	6.3	1.6		7.0		4.6

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	SBR	SBR2	NEL	NET	NER	NER2	SWT	SWR	SWR2	All
Denied Del/Veh (s)		0.1		0.2	0.3	0.1	0.2	0.1	0.1	0.2
Total Del/Veh (s)		1.3		7.2	4.9	7.9	6.3	5.3	5.6	6.5

Total Network Performance

Denied Del/Veh (s)	0.2
Total Del/Veh (s)	7.9

Intersection: 1: Diagonal Street & 8th Street & Elm Street

Movement	EB	WB	NB	SB	NE	SW
Directions Served	<LTR>	<LTR>	<LTR>	<LTR>	<LTR>	<LTR>
Maximum Queue (ft)	52	47	11	13	74	53
Average Queue (ft)	35	28	4	4	47	34
95th Queue (ft)	57	53	12	15	80	50
Link Distance (ft)	1038	1051	822	875	989	847
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	7:15	7:15	7:15	7:15	7:15	7:15
Total Time (min)	18	18	18	18	18	18
Time Recorded (min)	15	15	15	15	15	15
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	133	125	140	113	108	123
Vehs Exited	124	121	146	119	104	123
Starting Vehs	5	4	10	10	7	7
Ending Vehs	14	8	4	4	11	8
Travel Distance (mi)	49	47	55	45	40	47
Travel Time (hr)	2.8	2.6	3.2	2.4	2.3	2.7
Total Delay (hr)	0.8	0.6	0.9	0.6	0.6	0.7
Total Stops	90	80	105	78	64	81
Fuel Used (gal)	1.8	1.7	2.0	1.6	1.4	1.7

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	133	125	140	113	108	123
Vehs Exited	124	121	146	119	104	123
Starting Vehs	5	4	10	10	7	7
Ending Vehs	14	8	4	4	11	8
Travel Distance (mi)	49	47	55	45	40	47
Travel Time (hr)	2.8	2.6	3.2	2.4	2.3	2.7
Total Delay (hr)	0.8	0.6	0.9	0.6	0.6	0.7
Total Stops	90	80	105	78	64	81
Fuel Used (gal)	1.8	1.7	2.0	1.6	1.4	1.7

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	EBL2	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	WBR2	NBL2	NBL
Denied Del/Veh (s)		0.2	0.2	0.3	0.1		0.1	0.2	0.1	0.1	0.5	0.1
Total Del/Veh (s)		20.4	23.6	20.2	0.6		13.8	16.8	13.0	3.8	20.8	15.7

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	NBT	NBR2	SBL	SBT	SBR	SBR2	NEL2	NEL	NET	NER	NER2	SWL2
Denied Del/Veh (s)			0.1						0.2	0.3	0.1	
Total Del/Veh (s)			18.5						18.4	13.2	9.3	

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	SWL	SWT	SWR	SWR2	All
Denied Del/Veh (s)		0.2	0.2	0.4	0.2
Total Del/Veh (s)		15.0	15.6	7.6	18.0

Total Network Performance

Denied Del/Veh (s)	0.2
Total Del/Veh (s)	19.1

Intersection: 1: Diagonal Street & 8th Street & Elm Street

Movement	EB	WB	NB	SB	NE	SW
Directions Served	<LTR>	<LTR>	<LTR>	<LTR>	<LTR>	<LTR>
Maximum Queue (ft)	93	64	8	9	122	90
Average Queue (ft)	51	29	3	2	84	42
95th Queue (ft)	96	61	11	10	141	94
Link Distance (ft)	1038	1051	822	875	989	847
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Network Summary

Network wide Queuing Penalty: 0

Intersection: 1: Diagonal Street & 8th Street & Elm Street

Phase	2	4	6	8	10	14
Movement(s) Served	NBTL	EBTL	SBTL	WBTL	NETL	SWTL
Maximum Green (s)	22.5	21.5	22.5	21.5	22.5	22.5
Minimum Green (s)	5.0	5.0	5.0	5.0	5.0	5.0
Recall	None	None	None	None	Min	Min
Avg. Green (s)	22.5	19.2	22.5	19.2	20.9	20.9
g/C Ratio	-0.01	NA	-0.01	NA	NA	NA
Cycles Skipped (%)	25	0	25	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0	0
Cycles Maxed Out (%)	0	0	0	0	8	8
Cycles with Peds (%)	50	62	58	62	54	69

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

USER REPORT FOR NETWORK SITE

Project: Roundabout - 2020

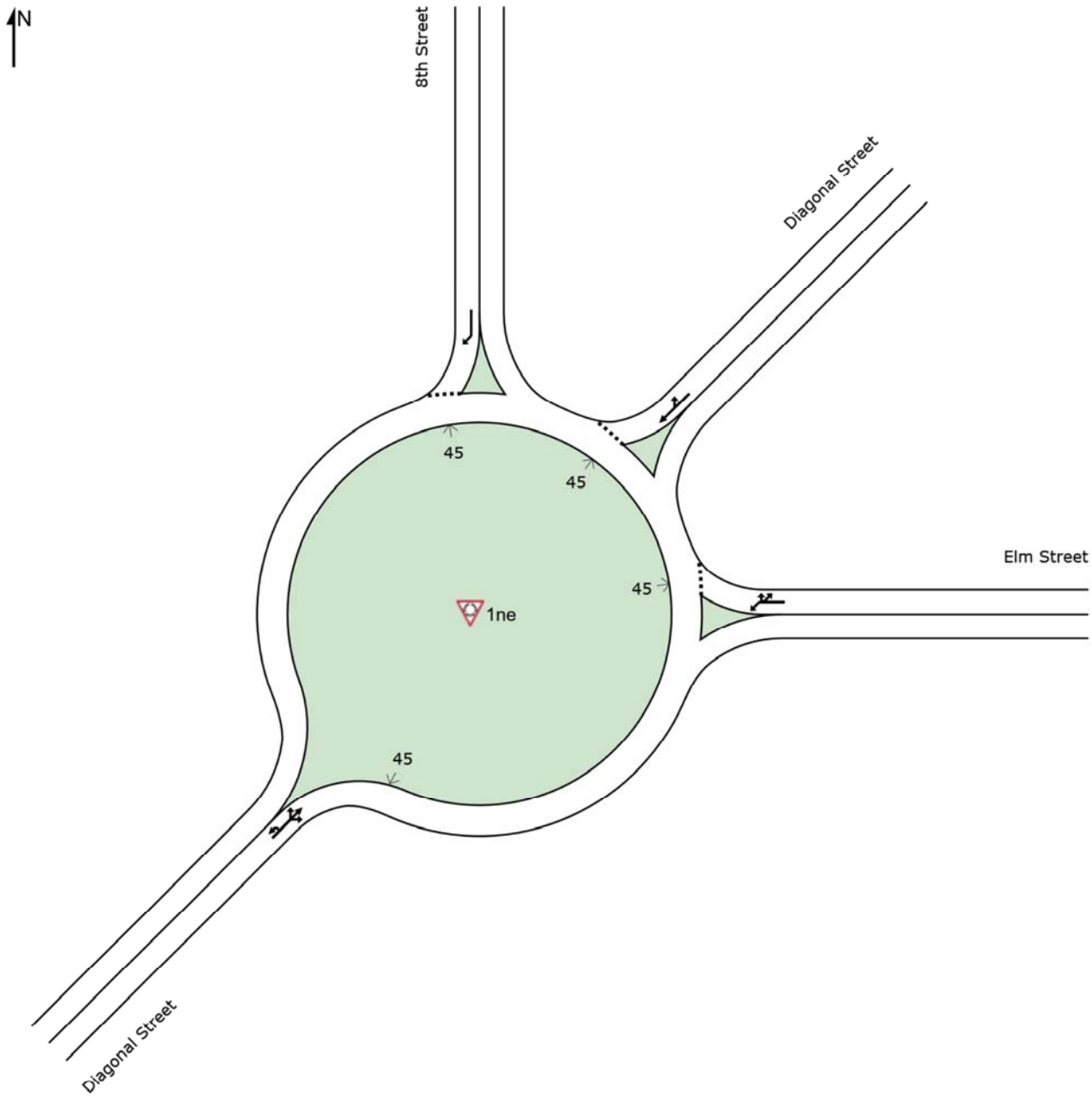
Template: Roundabout Analysis Summary by Movement (No LOS Display)

Site: 1ne [AM 2020 - NE]

Network: 1 [AM 2020]

Site Category: Peanut Roundabout
Roundabout

Site Layout



Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
East: Elm Street														
1a	L1	47	3.0	47	3.0	0.065	6.6	LOS A	0.3	7.7	0.42	0.57	0.42	22.1
16	R2	7	3.0	7	3.0	0.065	3.9	LOS A	0.3	7.7	0.42	0.57	0.42	23.5
16b	R3	3	3.0	3	3.0	0.065	4.4	LOS A	0.3	7.7	0.42	0.57	0.42	23.4
Approach		56	3.0	56	3.0	0.065	6.2	LOS A	0.3	7.7	0.42	0.57	0.42	22.4
NorthEast: Diagonal Street														
6x	T1	100	3.0	100	3.0	0.101	2.4	LOS A	0.5	13.4	0.24	0.31	0.24	23.4
16bx	R3	4	3.0	4	3.0	0.101	3.1	LOS A	0.5	13.4	0.24	0.31	0.24	24.1
Approach		104	3.0	104	3.0	0.101	2.4	LOS A	0.5	13.4	0.24	0.31	0.24	23.4
North: 8th Street														
14a	R1	15	3.0	15	3.0	0.016	2.7	LOS A	0.1	1.8	0.34	0.34	0.34	23.3
Approach		15	3.0	15	3.0	0.016	2.7	LOS A	0.1	1.8	0.34	0.34	0.34	23.3
SouthWest: Diagonal Street														
5ux	U	9	3.0	9	3.0	0.288	5.0	LOS A	0.0	0.0	0.00	0.26	0.00	17.9
5ax	L1	4	3.0	4	3.0	0.288	2.9	LOS A	0.0	0.0	0.00	0.26	0.00	25.3
2x	T1	229	3.0	229	3.0	0.288	0.9	LOS A	0.0	0.0	0.00	0.26	0.00	25.5
12ax	R1	80	3.0	80	3.0	0.288	0.7	LOS A	0.0	0.0	0.00	0.26	0.00	25.2
Approach		323	3.0	323	3.0	0.288	1.0	LOS A	0.0	0.0	0.00	0.26	0.00	25.4
All Vehicles		497	3.0	497	3.0	0.288	1.9	LOS A	0.5	13.4	0.11	0.31	0.11	24.5

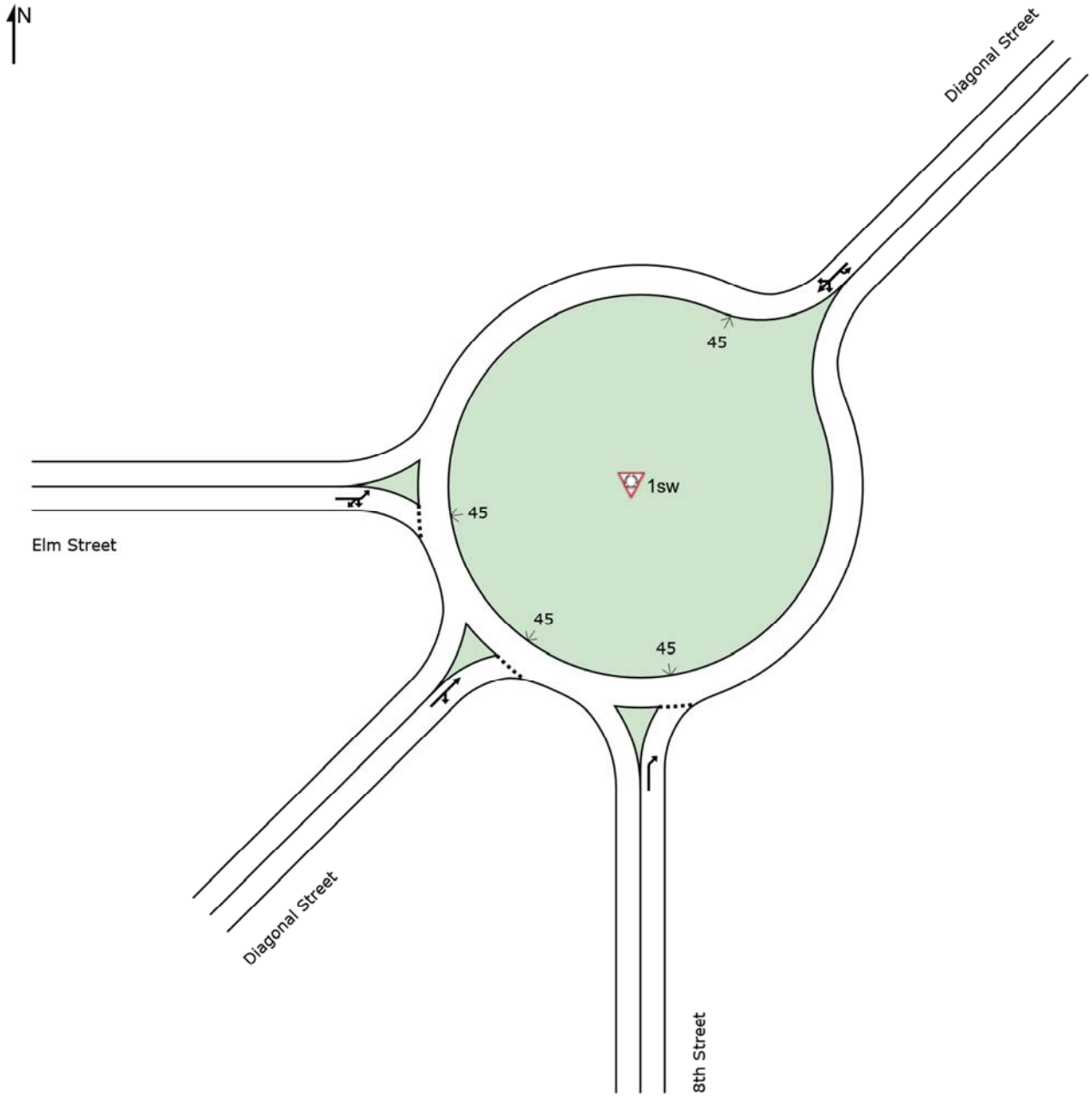
Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 1sw [AM 2020 - SW]

Network: 1 [AM 2020]

Site Category: Peanut Roundabout
Roundabout

Site Layout



Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
South: 8th Street														
18a	R1	12	3.0	12	3.0	0.015	3.8	LOS A	0.1	1.8	0.47	0.42	0.47	23.0
Approach		12	3.0	12	3.0	0.015	3.8	LOS A	0.1	1.8	0.47	0.42	0.47	23.0
NorthEast: Diagonal Street														
1ux	U	12	3.0	12	3.0	0.152	5.0	LOS A	0.0	0.0	0.00	0.30	0.00	17.1
1ax	L1	4	3.0	4	3.0	0.152	2.9	LOS A	0.0	0.0	0.00	0.30	0.00	25.2
6x	T1	88	3.0	88	3.0	0.152	0.9	LOS A	0.0	0.0	0.00	0.30	0.00	25.4
16ax	R1	67	3.0	67	3.0	0.152	0.7	LOS A	0.0	0.0	0.00	0.30	0.00	25.1
Approach		171	3.0	171	3.0	0.152	1.1	LOS A	0.0	0.0	0.00	0.30	0.00	25.2
West: Elm Street														
5a	L1	93	3.0	93	3.0	0.105	5.6	LOS A	0.5	12.9	0.28	0.52	0.28	22.3
12	R2	9	3.0	9	3.0	0.105	3.0	LOS A	0.5	12.9	0.28	0.52	0.28	23.6
12b	R3	1	3.0	1	3.0	0.105	3.4	LOS A	0.5	12.9	0.28	0.52	0.28	23.5
Approach		104	3.0	104	3.0	0.105	5.4	LOS A	0.5	12.9	0.28	0.52	0.28	22.5
SouthWest: Diagonal Street														
2x	T1	205	3.0	205	3.0	0.216	2.9	LOS A	1.2	30.8	0.35	0.37	0.35	23.1
12bx	R3	4	3.0	4	3.0	0.216	3.6	LOS A	1.2	30.8	0.35	0.37	0.35	24.0
Approach		209	3.0	209	3.0	0.216	2.9	LOS A	1.2	30.8	0.35	0.37	0.35	23.1
All Vehicles		496	3.0	496	3.0	0.216	2.8	LOS A	1.2	30.8	0.22	0.38	0.22	23.6

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	7:15	7:15	7:15	7:15	7:15	7:15
Total Time (min)	18	18	18	18	18	18
Time Recorded (min)	15	15	15	15	15	15
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	151	172	149	153	123	147
Vehs Exited	160	170	146	152	127	151
Starting Vehs	19	13	10	10	15	10
Ending Vehs	10	15	13	11	11	10
Travel Distance (mi)	59	65	57	59	48	58
Travel Time (hr)	2.9	3.3	2.7	2.8	2.3	2.8
Total Delay (hr)	0.4	0.5	0.4	0.4	0.2	0.4
Total Stops	120	114	114	118	89	106
Fuel Used (gal)	2.0	2.3	2.0	2.1	1.6	2.0

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	151	172	149	153	123	147
Vehs Exited	160	170	146	152	127	151
Starting Vehs	19	13	10	10	15	10
Ending Vehs	10	15	13	11	11	10
Travel Distance (mi)	59	65	57	59	48	58
Travel Time (hr)	2.9	3.3	2.7	2.8	2.3	2.8
Total Delay (hr)	0.4	0.5	0.4	0.4	0.2	0.4
Total Stops	120	114	114	118	89	106
Fuel Used (gal)	2.0	2.3	2.0	2.1	1.6	2.0

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	EBL2	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT
Denied Del/Veh (s)		0.2	0.1	0.3		0.2	0.1	0.1	0.3	0.1	0.1	
Total Del/Veh (s)		2.9	1.0	0.6	3.9	3.9	1.0	0.3	1.3	22.8	7.4	

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	NBR	NBR2	SBL2	SBL	SBT	NEL2	NEL	NET	NER	NER2	SWL2	SWL
Denied Del/Veh (s)		0.1	0.1	0.1		0.1	0.1	0.2	0.1	0.1	0.3	
Total Del/Veh (s)		1.0	6.9	8.7		2.9	8.3	9.1	6.2	7.0	18.5	

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	SWT	SWR	SWR2	All
Denied Del/Veh (s)	0.3	0.4	0.3	0.2
Total Del/Veh (s)	13.0	7.1	10.8	8.2

Total Network Performance

Denied Del/Veh (s)	0.2
Total Del/Veh (s)	8.8

Intersection: 1: Diagonal Street & 8th Street & Elm Street

Movement	EB	WB	NB	SB	NE	SW
Directions Served	<LTR>	<LTR>	<LTR>	<LTR>	<LTR>	<LTR>
Maximum Queue (ft)	38	33	19	11	64	121
Average Queue (ft)	9	8	6	5	47	71
95th Queue (ft)	34	34	18	14	71	126
Link Distance (ft)	1038	1051	822	875	989	847
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	7:15	7:15	7:15	7:15	7:15	7:15
Total Time (min)	18	18	18	18	18	18
Time Recorded (min)	15	15	15	15	15	15
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	143	159	169	134	123	144
Vehs Exited	150	156	161	131	128	146
Starting Vehs	15	13	8	5	12	7
Ending Vehs	8	16	16	8	7	8
Travel Distance (mi)	55	60	62	50	48	55
Travel Time (hr)	2.7	2.9	3.1	2.4	2.3	2.7
Total Delay (hr)	0.4	0.4	0.5	0.3	0.3	0.4
Total Stops	143	156	166	133	127	143
Fuel Used (gal)	2.0	2.1	2.2	1.8	1.7	1.9

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	143	159	169	134	123	144
Vehs Exited	150	156	161	131	128	146
Starting Vehs	15	13	8	5	12	7
Ending Vehs	8	16	16	8	7	8
Travel Distance (mi)	55	60	62	50	48	55
Travel Time (hr)	2.7	2.9	3.1	2.4	2.3	2.7
Total Delay (hr)	0.4	0.4	0.5	0.3	0.3	0.4
Total Stops	143	156	166	133	127	143
Fuel Used (gal)	2.0	2.1	2.2	1.8	1.7	1.9

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR
Denied Del/Veh (s)	0.2	0.1	0.7	0.1	0.2	0.1	0.1	0.1	0.1	0.3		
Total Del/Veh (s)	8.0	8.2	8.1	8.0	9.0	7.7	4.8	3.2	5.4	5.8		

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	NBR2	SBL2	SBL	SBT	NEL2	NEL	NET	NER	NER2	SWL2	SWT	SWR
Denied Del/Veh (s)		0.1	0.1				0.2	0.2	0.1	0.3	0.3	0.3
Total Del/Veh (s)		2.9	6.4				7.9	5.9	4.9	12.8	8.1	6.7

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	SWR2	All
Denied Del/Veh (s)	0.2	0.2
Total Del/Veh (s)	5.0	7.7

Total Network Performance

Denied Del/Veh (s)	0.2
Total Del/Veh (s)	8.8

Intersection: 1: Diagonal Street & 8th Street & Elm Street

Movement	EB	WB	NB	SB	NE	SW
Directions Served	<LTR>	<LTR>	<LTR>	<LTR>	<LTR>	<LTR>
Maximum Queue (ft)	58	55	11	11	90	68
Average Queue (ft)	32	31	5	3	48	53
95th Queue (ft)	60	55	14	12	87	81
Link Distance (ft)	1038	1051	822	875	989	847
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	7:15	7:15	7:15	7:15	7:15	7:15
Total Time (min)	18	18	18	18	18	18
Time Recorded (min)	15	15	15	15	15	15
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	140	142	167	150	142	148
Vehs Exited	129	141	155	145	149	143
Starting Vehs	7	9	13	9	15	10
Ending Vehs	18	10	25	14	8	11
Travel Distance (mi)	52	54	61	59	56	56
Travel Time (hr)	3.0	3.1	3.6	3.6	3.2	3.3
Total Delay (hr)	0.8	0.8	1.0	1.1	0.9	0.9
Total Stops	95	100	114	114	103	105
Fuel Used (gal)	1.9	2.0	2.2	2.2	2.1	2.1

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	140	142	167	150	142	148
Vehs Exited	129	141	155	145	149	143
Starting Vehs	7	9	13	9	15	10
Ending Vehs	18	10	25	14	8	11
Travel Distance (mi)	52	54	61	59	56	56
Travel Time (hr)	3.0	3.1	3.6	3.6	3.2	3.3
Total Delay (hr)	0.8	0.8	1.0	1.1	0.9	0.9
Total Stops	95	100	114	114	103	105
Fuel Used (gal)	1.9	2.0	2.2	2.2	2.1	2.1

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR
Denied Del/Veh (s)	0.3	0.1	0.1	0.1	0.2	0.1	0.1	0.5	0.1	0.1		0.1
Total Del/Veh (s)	23.4	21.1	15.3	5.2	19.8	19.5	15.1	27.4	2.1	26.4		12.0

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	NBR2	SBL2	SBL	NEL2	NET	NER	NER2	SWL2	SWL	SWT	SWR	SWR2
Denied Del/Veh (s)		0.1	0.1		0.2	0.2	0.1	0.1		0.2	0.2	0.6
Total Del/Veh (s)		19.6	25.9		20.3	17.9	9.6	23.9		20.2	18.4	19.6

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	20.2

Total Network Performance

Denied Del/Veh (s)	0.2
Total Del/Veh (s)	21.9

Intersection: 1: Diagonal Street & 8th Street & Elm Street

Movement	EB	WB	NB	SB	NE	SW
Directions Served	<LTR>	<LTR>	<LTR>	<LTR>	<LTR>	<LTR>
Maximum Queue (ft)	87	100	15	15	115	148
Average Queue (ft)	42	51	5	5	59	101
95th Queue (ft)	98	105	16	16	122	155
Link Distance (ft)	1038	1051	822	875	989	847
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Network Summary

Network wide Queuing Penalty: 0

Intersection: 1: Diagonal Street & 8th Street & Elm Street

Phase	2	4	6	8	10	14
Movement(s) Served	NBTL	EBTL	SBTL	WBTL	NETL	SWTL
Maximum Green (s)	22.5	21.5	22.5	21.5	22.5	22.5
Minimum Green (s)	5.0	5.0	5.0	5.0	5.0	5.0
Recall	None	None	None	None	Min	Min
Avg. Green (s)	19.4	20.6	19.4	20.6	21.5	21.5
g/C Ratio	-0.01	NA	-0.01	NA	NA	NA
Cycles Skipped (%)	8	0	8	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0	0
Cycles Maxed Out (%)	0	0	0	0	8	8
Cycles with Peds (%)	58	50	58	67	50	58

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

USER REPORT FOR NETWORK SITE

Project: Roundabout - 2020

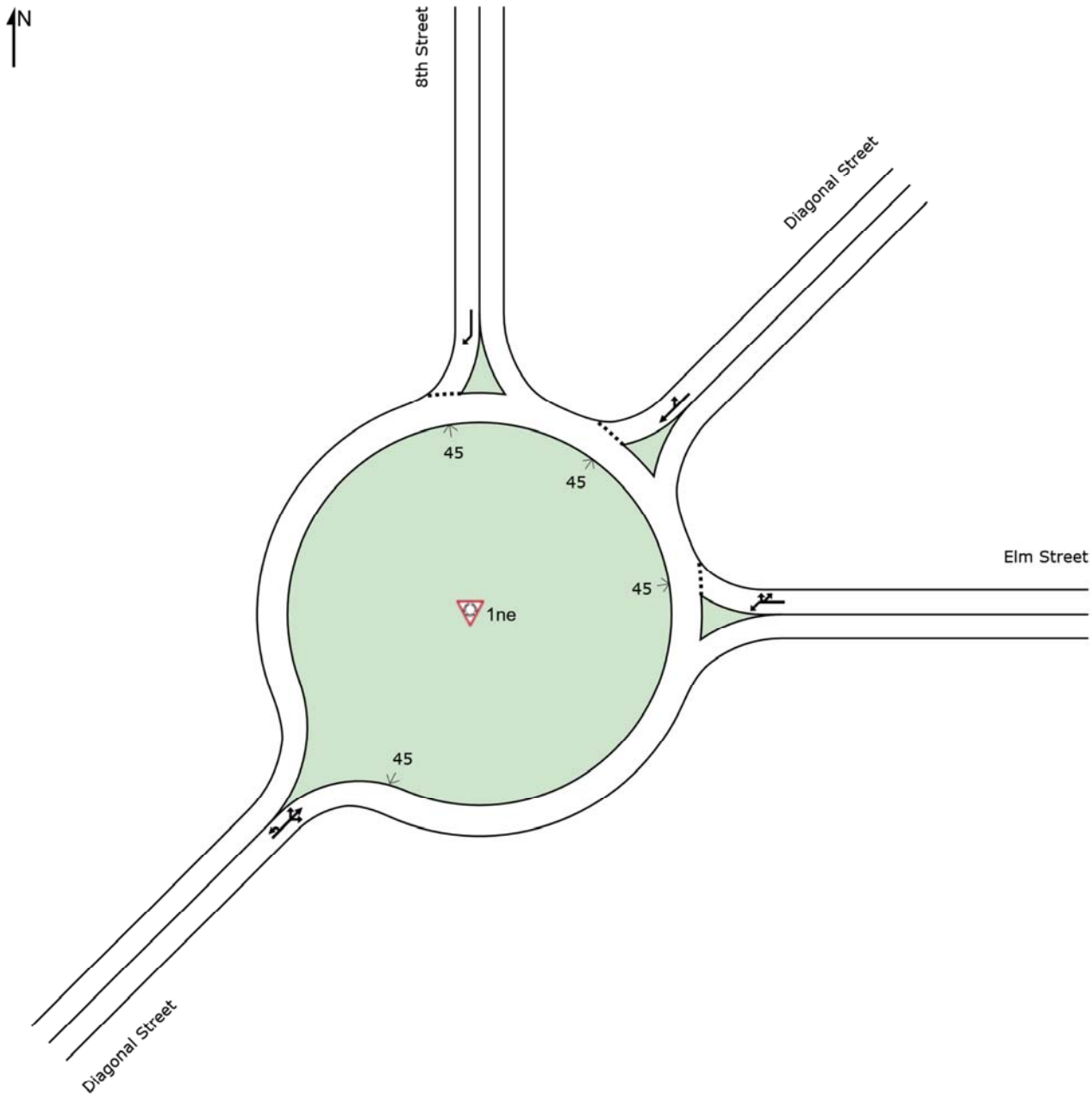
Template: Roundabout Analysis Summary by Movement (No LOS Display)

Site: 1ne [PM 2020 - NE]

Network: 2 [PM 2020]

Site Category: Peanut Roundabout
Roundabout

Site Layout



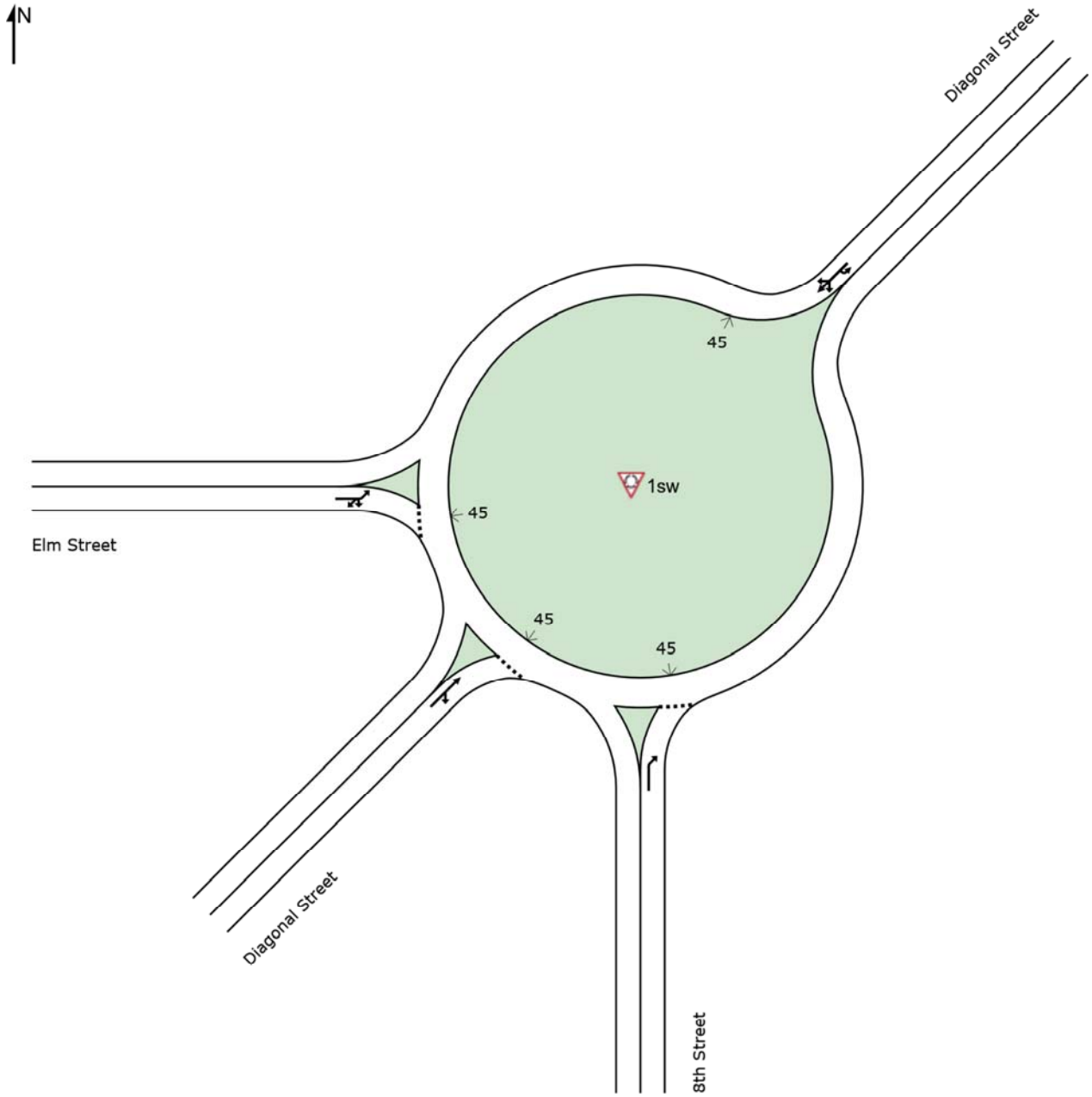
Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
East: Elm Street														
1a	L1	78	3.0	78	3.0	0.098	6.1	LOS A	0.5	11.9	0.36	0.55	0.36	22.2
16	R2	10	3.0	10	3.0	0.098	3.4	LOS A	0.5	11.9	0.36	0.55	0.36	23.5
16b	R3	2	3.0	2	3.0	0.098	3.9	LOS A	0.5	11.9	0.36	0.55	0.36	23.4
Approach		90	3.0	90	3.0	0.098	5.8	LOS A	0.5	11.9	0.36	0.55	0.36	22.4
NorthEast: Diagonal Street														
6x	T1	234	3.0	234	3.0	0.246	2.9	LOS A	1.4	36.6	0.35	0.37	0.35	23.1
16bx	R3	6	3.0	6	3.0	0.246	3.6	LOS A	1.4	36.6	0.35	0.37	0.35	24.0
Approach		241	3.0	241	3.0	0.246	2.9	LOS A	1.4	36.6	0.35	0.37	0.35	23.1
North: 8th Street														
14a	R1	19	3.0	19	3.0	0.025	4.0	LOS A	0.1	3.0	0.49	0.45	0.49	23.0
Approach		19	3.0	19	3.0	0.025	4.0	LOS A	0.1	3.0	0.49	0.45	0.49	23.0
SouthWest: Diagonal Street														
5ux	U	16	3.0	16	3.0	0.227	5.0	LOS A	0.0	0.0	0.00	0.29	0.00	17.3
5ax	L1	4	3.0	4	3.0	0.227	2.9	LOS A	0.0	0.0	0.00	0.29	0.00	25.2
2x	T1	151	3.0	151	3.0	0.227	0.9	LOS A	0.0	0.0	0.00	0.29	0.00	25.4
12ax	R1	84	3.0	84	3.0	0.227	0.7	LOS A	0.0	0.0	0.00	0.29	0.00	25.1
Approach		255	3.0	255	3.0	0.227	1.1	LOS A	0.0	0.0	0.00	0.29	0.00	25.3
All Vehicles		605	3.0	605	3.0	0.246	2.6	LOS A	1.4	36.6	0.21	0.37	0.21	23.8

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 1sw [PM 2020 - SW] Network: 2 [PM 2020]

Site Category: Peanut Roundabout
Roundabout

Site Layout



Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
South: 8th Street														
18a	R1	18	3.0	18	3.0	0.021	3.3	LOS A	0.1	2.5	0.41	0.39	0.41	23.1
Approach		18	3.0	18	3.0	0.021	3.3	LOS A	0.1	2.5	0.41	0.39	0.41	23.1
NorthEast: Diagonal Street														
1ux	U	24	3.0	24	3.0	0.311	5.0	LOS A	0.0	0.0	0.00	0.29	0.00	17.3
1ax	L1	4	3.0	4	3.0	0.311	2.9	LOS A	0.0	0.0	0.00	0.29	0.00	25.2
6x	T1	219	3.0	219	3.0	0.311	0.9	LOS A	0.0	0.0	0.00	0.29	0.00	25.4
16ax	R1	101	3.0	101	3.0	0.311	0.7	LOS A	0.0	0.0	0.00	0.29	0.00	25.1
Approach		348	3.0	348	3.0	0.311	1.1	LOS A	0.0	0.0	0.00	0.29	0.00	25.3
West: Elm Street														
5a	L1	80	3.0	80	3.0	0.107	6.7	LOS A	0.5	13.0	0.43	0.59	0.43	22.0
12	R2	9	3.0	9	3.0	0.107	4.0	LOS A	0.5	13.0	0.43	0.59	0.43	23.4
12b	R3	3	3.0	3	3.0	0.107	4.5	LOS A	0.5	13.0	0.43	0.59	0.43	23.3
Approach		91	3.0	91	3.0	0.107	6.4	LOS A	0.5	13.0	0.43	0.59	0.43	22.3
SouthWest: Diagonal Street														
2x	T1	133	3.0	133	3.0	0.142	2.8	LOS A	0.8	19.3	0.33	0.36	0.33	23.1
12bx	R3	4	3.0	4	3.0	0.142	3.5	LOS A	0.8	19.3	0.33	0.36	0.33	24.0
Approach		138	3.0	138	3.0	0.142	2.8	LOS A	0.8	19.3	0.33	0.36	0.33	23.2
All Vehicles		596	3.0	596	3.0	0.311	2.4	LOS A	0.8	19.3	0.16	0.36	0.16	24.1

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	7:15	7:15	7:15	7:15	7:15	7:15
Total Time (min)	18	18	18	18	18	18
Time Recorded (min)	15	15	15	15	15	15
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	144	123	147	130	125	128
Vehs Exited	144	119	144	132	129	133
Starting Vehs	10	4	9	9	13	6
Ending Vehs	10	8	12	7	9	9
Travel Distance (mi)	55	46	56	50	48	51
Travel Time (hr)	2.6	2.2	2.7	2.3	2.3	2.4
Total Delay (hr)	0.3	0.3	0.3	0.3	0.2	0.3
Total Stops	106	84	107	99	97	95
Fuel Used (gal)	1.9	1.6	1.9	1.7	1.6	1.7

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	144	123	147	130	125	128
Vehs Exited	144	119	144	132	129	133
Starting Vehs	10	4	9	9	13	6
Ending Vehs	10	8	12	7	9	9
Travel Distance (mi)	55	46	56	50	48	51
Travel Time (hr)	2.6	2.2	2.7	2.3	2.3	2.4
Total Delay (hr)	0.3	0.3	0.3	0.3	0.2	0.3
Total Stops	106	84	107	99	97	95
Fuel Used (gal)	1.9	1.6	1.9	1.7	1.6	1.7

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2	SBL2
Denied Del/Veh (s)	0.2	0.2	0.1	0.2	0.1	0.3	0.1	0.1				
Total Del/Veh (s)	2.9	1.3	1.1	2.2	0.2	0.0	0.2	3.7				

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	SBL	SBR	SBR2	NEL	NET	NER	NER2	SWL2	SWL	SWT	SWR	SWR2
Denied Del/Veh (s)	0.1				0.2	0.2	0.1			0.2	0.1	0.1
Total Del/Veh (s)	10.3		3.2		8.7	6.9	5.9			8.2	4.5	6.9

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	6.3

Total Network Performance

Denied Del/Veh (s)	0.2
Total Del/Veh (s)	7.1

Intersection: 1: Diagonal Street & 8th Street & Elm Street

Movement	EB	WB	NB	SB	NE	SW
Directions Served	<LTR>	<LTR>	<LTR>	<LTR>	<LTR>	<LTR>
Maximum Queue (ft)	38	5	9	11	97	66
Average Queue (ft)	13	1	3	4	59	41
95th Queue (ft)	41	7	11	13	90	67
Link Distance (ft)	1038	1051	822	875	989	847
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	7:15	7:15	7:15	7:15	7:15	7:15
Total Time (min)	18	18	18	18	18	18
Time Recorded (min)	15	15	15	15	15	15
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	127	142	135	129	127	131
Vehs Exited	127	134	134	133	122	130
Starting Vehs	6	4	8	9	8	5
Ending Vehs	6	12	9	5	13	8
Travel Distance (mi)	49	51	52	50	47	50
Travel Time (hr)	2.3	2.5	2.5	2.4	2.3	2.4
Total Delay (hr)	0.3	0.4	0.3	0.3	0.3	0.3
Total Stops	130	138	136	130	123	130
Fuel Used (gal)	1.7	1.8	1.8	1.7	1.6	1.7

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	127	142	135	129	127	131
Vehs Exited	127	134	134	133	122	130
Starting Vehs	6	4	8	9	8	5
Ending Vehs	6	12	9	5	13	8
Travel Distance (mi)	49	51	52	50	47	50
Travel Time (hr)	2.3	2.5	2.5	2.4	2.3	2.4
Total Delay (hr)	0.3	0.4	0.3	0.3	0.3	0.3
Total Stops	130	138	136	130	123	130
Fuel Used (gal)	1.7	1.8	1.8	1.7	1.6	1.7

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBR2	SBL	SBR	SBR2
Denied Del/Veh (s)	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1		0.1		0.1
Total Del/Veh (s)	5.7	8.2	5.1	6.4	6.8	4.5	4.4	10.8		6.7		1.9

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	NEL	NET	NER	NER2	SWL2	SWL	SWT	SWR	SWR2	All
Denied Del/Veh (s)		0.2	0.2	0.1			0.1	0.1	0.1	0.2
Total Del/Veh (s)		8.2	6.4	9.6			6.6	3.9	5.5	7.2

Total Network Performance

Denied Del/Veh (s)	0.2
Total Del/Veh (s)	8.4

Intersection: 1: Diagonal Street & 8th Street & Elm Street

Movement	EB	WB	NB	SB	NE	SW
Directions Served	<LTR>	<LTR>	<LTR>	<LTR>	<LTR>	<LTR>
Maximum Queue (ft)	60	42	9	16	91	54
Average Queue (ft)	37	24	2	5	57	36
95th Queue (ft)	62	44	9	16	89	52
Link Distance (ft)	1038	1051	822	875	989	847
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	7:15	7:15	7:15	7:15	7:15	7:15
Total Time (min)	18	18	18	18	18	18
Time Recorded (min)	15	15	15	15	15	15
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	148	152	161	141	136	147
Vehs Exited	150	144	158	147	136	146
Starting Vehs	12	12	6	13	10	10
Ending Vehs	10	20	9	7	10	9
Travel Distance (mi)	56	57	61	55	52	56
Travel Time (hr)	3.3	3.3	3.4	3.2	3.0	3.2
Total Delay (hr)	0.9	0.9	0.9	1.0	0.9	0.9
Total Stops	101	108	120	109	96	106
Fuel Used (gal)	2.1	2.1	2.2	2.0	2.0	2.1

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	148	152	161	141	136	147
Vehs Exited	150	144	158	147	136	146
Starting Vehs	12	12	6	13	10	10
Ending Vehs	10	20	9	7	10	9
Travel Distance (mi)	56	57	61	55	52	56
Travel Time (hr)	3.3	3.3	3.4	3.2	3.0	3.2
Total Delay (hr)	0.9	0.9	0.9	1.0	0.9	0.9
Total Stops	101	108	120	109	96	106
Fuel Used (gal)	2.1	2.1	2.2	2.0	2.0	2.1

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	EBL2	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	WBR2	NBL	NBT	NBR2
Denied Del/Veh (s)		0.2	0.1	0.3		0.1	0.2	0.1	0.1	0.1		
Total Del/Veh (s)		18.0	21.7	23.3		10.6	17.6	19.3	2.8	12.9		

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	SBL2	SBL	SBR2	NEL	NET	NER	NER2	SWL2	SWT	SWR	SWR2	All
Denied Del/Veh (s)		0.1		0.1	0.2	0.3	0.7		0.2	0.2	0.1	0.2
Total Del/Veh (s)		20.7		8.2	21.4	22.2	14.3		18.3	22.0	5.8	20.4

Total Network Performance

Denied Del/Veh (s)	0.2
Total Del/Veh (s)	21.3

Intersection: 1: Diagonal Street & 8th Street & Elm Street

Movement	EB	WB	NB	SB	NE	SW
Directions Served	<LTR>	<LTR>	<LTR>	<LTR>	<LTR>	<LTR>
Maximum Queue (ft)	101	59	15	19	163	125
Average Queue (ft)	58	28	4	5	105	69
95th Queue (ft)	104	59	15	18	175	135
Link Distance (ft)	1038	1051	822	875	989	847
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Network Summary

Network wide Queuing Penalty: 0

Intersection: 1: Diagonal Street & 8th Street & Elm Street

Phase	2	4	6	8	10	14
Movement(s) Served	NBTL	EBTL	SBTL	WBTL	NETL	SWTL
Maximum Green (s)	22.5	21.5	22.5	21.5	22.5	22.5
Minimum Green (s)	5.0	5.0	5.0	5.0	5.0	5.0
Recall	None	None	None	None	Min	Min
Avg. Green (s)	21.5	20.5	21.5	20.5	21.5	21.5
g/C Ratio	-0.01	NA	-0.01	NA	NA	NA
Cycles Skipped (%)	17	0	17	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0	0
Cycles Maxed Out (%)	0	0	0	0	8	8
Cycles with Peds (%)	58	58	50	58	58	50

Controller Summary
Average Cycle Length (s): NA
Number of Complete Cycles : 0

USER REPORT FOR NETWORK SITE

Project: Roundabout - 2040

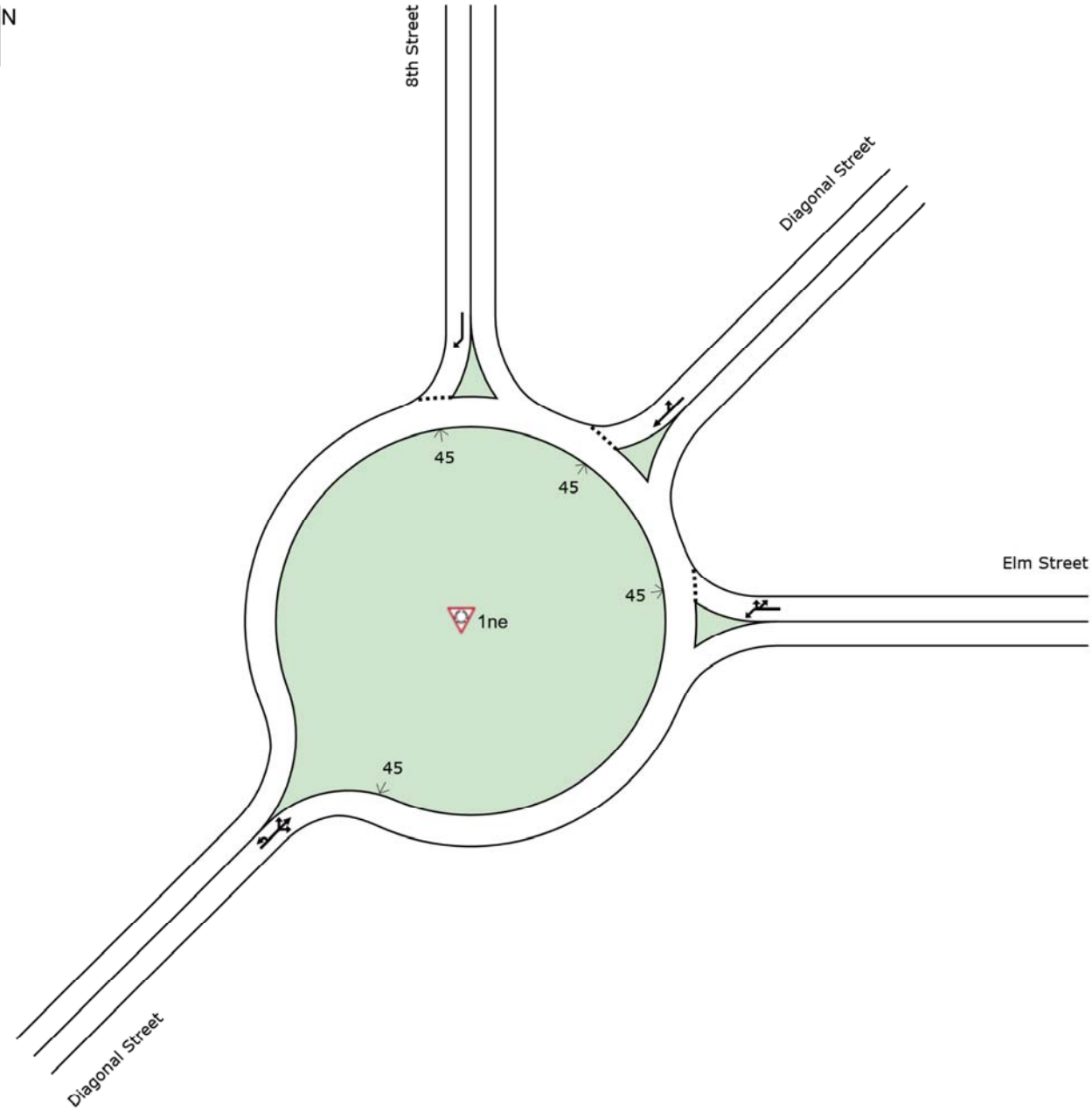
Template: Roundabout Analysis Summary by Movement (No LOS Display)

Site: 1ne [AM 2040 - NE]

Network: 1 [AM 2040]

Site Category: Peanut Roundabout
Roundabout

Site Layout



Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
East: Elm Street														
1a	L1	51	3.0	51	3.0	0.073	6.8	LOS A	0.3	8.7	0.44	0.59	0.44	22.0
16	R2	7	3.0	7	3.0	0.073	4.1	LOS A	0.3	8.7	0.44	0.59	0.44	23.4
16b	R3	2	3.0	2	3.0	0.073	4.6	LOS A	0.3	8.7	0.44	0.59	0.44	23.3
Approach		61	3.0	61	3.0	0.073	6.4	LOS A	0.3	8.7	0.44	0.59	0.44	22.3
NorthEast: Diagonal Street														
6x	T1	110	3.0	110	3.0	0.113	2.5	LOS A	0.6	15.2	0.26	0.32	0.26	23.3
16bx	R3	5	3.0	5	3.0	0.113	3.2	LOS A	0.6	15.2	0.26	0.32	0.26	24.1
Approach		114	3.0	114	3.0	0.113	2.5	LOS A	0.6	15.2	0.26	0.32	0.26	23.4
North: 8th Street														
14a	R1	15	3.0	15	3.0	0.017	2.9	LOS A	0.1	2.0	0.35	0.35	0.35	23.3
Approach		15	3.0	15	3.0	0.017	2.9	LOS A	0.1	2.0	0.35	0.35	0.35	23.3
SouthWest: Diagonal Street														
5ux	U	11	3.0	11	3.0	0.316	4.9	LOS A	0.0	0.0	0.00	0.27	0.00	17.8
5ax	L1	5	3.0	5	3.0	0.316	2.9	LOS A	0.0	0.0	0.00	0.27	0.00	25.3
2x	T1	250	3.0	250	3.0	0.316	0.9	LOS A	0.0	0.0	0.00	0.27	0.00	25.5
12ax	R1	87	3.0	87	3.0	0.316	0.7	LOS A	0.0	0.0	0.00	0.27	0.00	25.2
Approach		352	3.0	352	3.0	0.316	1.0	LOS A	0.0	0.0	0.00	0.27	0.00	25.4
All Vehicles		543	3.0	543	3.0	0.316	2.0	LOS A	0.6	15.2	0.11	0.32	0.11	24.4

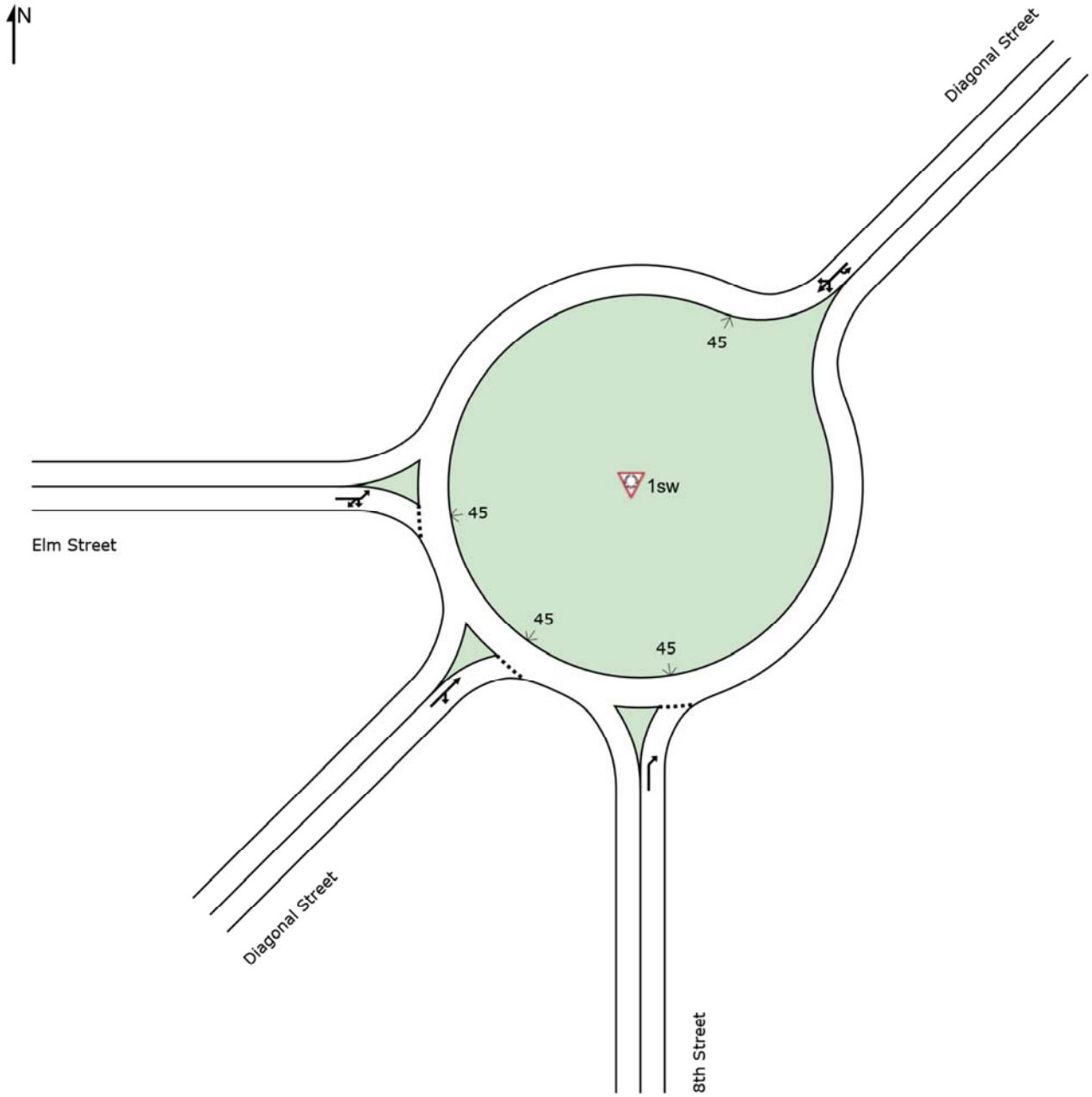
Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 1sw [AM 2040 - SW]

Network: 1 [AM 2040]

Site Category: Peanut Roundabout
Roundabout

Site Layout



Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
South: 8th Street														
18a	R1	13	3.0	13	3.0	0.017	4.0	LOS A	0.1	2.1	0.49	0.44	0.49	23.0
Approach		13	3.0	13	3.0	0.017	4.0	LOS A	0.1	2.1	0.49	0.44	0.49	23.0
NorthEast: Diagonal Street														
1ux	U	13	3.0	13	3.0	0.168	4.9	LOS A	0.0	0.0	0.00	0.30	0.00	17.0
1ax	L1	5	3.0	5	3.0	0.168	2.9	LOS A	0.0	0.0	0.00	0.30	0.00	25.2
6x	T1	96	3.0	96	3.0	0.168	0.9	LOS A	0.0	0.0	0.00	0.30	0.00	25.4
16ax	R1	73	3.0	73	3.0	0.168	0.7	LOS A	0.0	0.0	0.00	0.30	0.00	25.1
Approach		187	3.0	187	3.0	0.168	1.1	LOS A	0.0	0.0	0.00	0.30	0.00	25.2
West: Elm Street														
5a	L1	101	3.0	101	3.0	0.117	5.7	LOS A	0.6	14.4	0.30	0.53	0.30	22.2
12	R2	11	3.0	11	3.0	0.117	3.1	LOS A	0.6	14.4	0.30	0.53	0.30	23.5
12b	R3	1	3.0	1	3.0	0.117	3.6	LOS A	0.6	14.4	0.30	0.53	0.30	23.5
Approach		113	3.0	113	3.0	0.117	5.5	LOS A	0.6	14.4	0.30	0.53	0.30	22.5
SouthWest: Diagonal Street														
2x	T1	224	3.0	224	3.0	0.242	3.1	LOS A	1.4	35.1	0.38	0.39	0.38	23.0
12bx	R3	5	3.0	5	3.0	0.242	3.8	LOS A	1.4	35.1	0.38	0.39	0.38	23.9
Approach		229	3.0	229	3.0	0.242	3.1	LOS A	1.4	35.1	0.38	0.39	0.38	23.1
All Vehicles		542	3.0	542	3.0	0.242	2.9	LOS A	1.4	35.1	0.24	0.39	0.24	23.6

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	7:15	7:15	7:15	7:15	7:15	7:15
Total Time (min)	18	18	18	18	18	18
Time Recorded (min)	15	15	15	15	15	15
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	191	201	207	172	155	185
Vehs Exited	195	192	198	173	155	184
Starting Vehs	15	11	11	10	12	10
Ending Vehs	11	20	20	9	12	14
Travel Distance (mi)	72	75	78	65	59	70
Travel Time (hr)	3.8	4.0	3.8	3.6	2.9	3.6
Total Delay (hr)	0.7	0.9	0.6	0.9	0.4	0.7
Total Stops	150	140	153	139	115	137
Fuel Used (gal)	2.6	2.7	2.7	2.4	2.0	2.5

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	191	201	207	172	155	185
Vehs Exited	195	192	198	173	155	184
Starting Vehs	15	11	11	10	12	10
Ending Vehs	11	20	20	9	12	14
Travel Distance (mi)	72	75	78	65	59	70
Travel Time (hr)	3.8	4.0	3.8	3.6	2.9	3.6
Total Delay (hr)	0.7	0.9	0.6	0.9	0.4	0.7
Total Stops	150	140	153	139	115	137
Fuel Used (gal)	2.6	2.7	2.7	2.4	2.0	2.5

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	WBR2	NBL2	NBL	NBR
Denied Del/Veh (s)	0.2	0.2	0.1	0.1		0.1	0.1	0.1	0.1	0.1	0.1	
Total Del/Veh (s)	2.8	1.2	2.3	0.3		2.9	1.1	0.9	0.4	9.8	12.0	

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	SBL2	SBL	SBT	SBR	SBR2	NEL2	NEL	NET	NER	NER2	SWL2	SWL
Denied Del/Veh (s)	0.1	0.1			0.1			0.2	0.1	0.1	0.4	
Total Del/Veh (s)	14.0	11.9			7.1			11.6	7.8	3.9	20.0	

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	SWT	SWR	SWR2	All
Denied Del/Veh (s)	0.3	0.3	0.1	0.2
Total Del/Veh (s)	20.5	18.0	17.7	12.2

Total Network Performance

Denied Del/Veh (s)	0.2
Total Del/Veh (s)	13.0

Intersection: 1: Diagonal Street & 8th Street & Elm Street

Movement	EB	WB	NB	SB	NE	SW
Directions Served	<LTR>	<LTR>	<LTR>	<LTR>	<LTR>	<LTR>
Maximum Queue (ft)	38	25	11	16	83	204
Average Queue (ft)	14	9	6	7	54	119
95th Queue (ft)	43	29	14	18	94	220
Link Distance (ft)	1038	1051	822	875	989	847
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	7:15	7:15	7:15	7:15	7:15	7:15
Total Time (min)	18	18	18	18	18	18
Time Recorded (min)	15	15	15	15	15	15
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	191	194	195	179	162	183
Vehs Exited	195	193	186	181	163	185
Starting Vehs	16	14	8	11	15	12
Ending Vehs	12	15	17	9	14	12
Travel Distance (mi)	73	74	72	69	62	70
Travel Time (hr)	3.8	3.6	3.6	3.5	3.1	3.5
Total Delay (hr)	0.8	0.6	0.6	0.6	0.5	0.6
Total Stops	191	194	194	180	162	184
Fuel Used (gal)	2.7	2.6	2.6	2.5	2.1	2.5

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	191	194	195	179	162	183
Vehs Exited	195	193	186	181	163	185
Starting Vehs	16	14	8	11	15	12
Ending Vehs	12	15	17	9	14	12
Travel Distance (mi)	73	74	72	69	62	70
Travel Time (hr)	3.8	3.6	3.6	3.5	3.1	3.5
Total Delay (hr)	0.8	0.6	0.6	0.6	0.5	0.6
Total Stops	191	194	194	180	162	184
Fuel Used (gal)	2.7	2.6	2.6	2.5	2.1	2.5

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	WBR2	NBL2	NBL	NBR
Denied Del/Veh (s)	0.1	0.2	0.2	0.1		0.1	0.2	0.1	0.1	0.1	0.1	
Total Del/Veh (s)	9.0	10.1	7.7	5.4		9.4	9.0	7.7	8.0	10.5	9.4	

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	NBR2	SBL2	SBL	SBT	SBR	SBR2	NEL	NET	NER	NER2	SWL2	SWL
Denied Del/Veh (s)		0.1	0.1		0.1			0.2	0.2	0.1	0.5	
Total Del/Veh (s)		8.5	9.5	3.7	3.7	3.7		7.9	3.9	4.4	9.2	

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	SWT	SWR	SWR2	All
Denied Del/Veh (s)	0.3	0.2	0.2	0.2
Total Del/Veh (s)	13.0	10.4	10.1	10.1

Total Network Performance

Denied Del/Veh (s)	0.2
Total Del/Veh (s)	11.2

Intersection: 1: Diagonal Street & 8th Street & Elm Street

Movement	EB	WB	NB	SB	NE	SW
Directions Served	<LTR>	<LTR>	<LTR>	<LTR>	<LTR>	<LTR>
Maximum Queue (ft)	68	68	11	11	78	139
Average Queue (ft)	35	36	4	7	49	86
95th Queue (ft)	65	68	13	15	80	148
Link Distance (ft)	1038	1051	822	875	989	847
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	7:15	7:15	7:15	7:15	7:15	7:15
Total Time (min)	18	18	18	18	18	18
Time Recorded (min)	15	15	15	15	15	15
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	183	199	191	186	175	184
Vehs Exited	175	192	188	188	173	184
Starting Vehs	11	15	16	18	16	15
Ending Vehs	19	22	19	16	18	15
Travel Distance (mi)	68	73	71	72	67	70
Travel Time (hr)	4.1	4.4	4.4	4.3	4.0	4.2
Total Delay (hr)	1.3	1.4	1.5	1.3	1.2	1.3
Total Stops	130	157	144	140	123	137
Fuel Used (gal)	2.6	2.8	2.7	2.7	2.5	2.6

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	183	199	191	186	175	184
Vehs Exited	175	192	188	188	173	184
Starting Vehs	11	15	16	18	16	15
Ending Vehs	19	22	19	16	18	15
Travel Distance (mi)	68	73	71	72	67	70
Travel Time (hr)	4.1	4.4	4.4	4.3	4.0	4.2
Total Delay (hr)	1.3	1.4	1.5	1.3	1.2	1.3
Total Stops	130	157	144	140	123	137
Fuel Used (gal)	2.6	2.8	2.7	2.7	2.5	2.6

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT
Denied Del/Veh (s)	0.2	0.2	0.1	0.1		0.2	0.1	0.3	0.1	0.1	0.1	
Total Del/Veh (s)	23.3	22.0	21.2	20.6		24.4	23.9	16.5	6.2	23.5	23.1	

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	NBR	NBR2	SBL2	SBL	SBT	SBR	SBR2	NEL2	NEL	NET	NER	NER2
Denied Del/Veh (s)			0.4	0.1		0.1	0.1	0.1	0.1	0.2	0.2	0.1
Total Del/Veh (s)			14.6	17.5		12.9	6.8	23.4	17.1	18.8	20.3	5.1

1: Diagonal Street & 8th Street & Elm Street Performance by movement

Movement	SWL2	SWL	SWT	SWR	SWR2	All
Denied Del/Veh (s)	0.3		0.2	0.3	0.1	0.2
Total Del/Veh (s)	24.2		25.3	22.3	6.8	22.6

Total Network Performance

Denied Del/Veh (s)	0.2
Total Del/Veh (s)	23.8

Intersection: 1: Diagonal Street & 8th Street & Elm Street

Movement	EB	WB	NB	SB	NE	SW
Directions Served	<LTR>	<LTR>	<LTR>	<LTR>	<LTR>	<LTR>
Maximum Queue (ft)	94	100	28	20	140	210
Average Queue (ft)	55	57	8	7	83	137
95th Queue (ft)	107	110	28	21	148	222
Link Distance (ft)	1038	1051	822	875	989	847
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Network Summary

Network wide Queuing Penalty: 0

Intersection: 1: Diagonal Street & 8th Street & Elm Street

Phase	2	4	6	8	10	14
Movement(s) Served	NBTL	EBTL	SBTL	WBTL	NETL	SWTL
Maximum Green (s)	21.5	21.1	21.5	21.1	23.9	23.9
Minimum Green (s)	5.0	5.0	5.0	5.0	5.0	5.0
Recall	None	None	None	None	Min	Min
Avg. Green (s)	20.7	19.8	20.7	19.8	21.7	21.7
g/C Ratio	-0.01	NA	-0.01	NA	NA	NA
Cycles Skipped (%)	8	0	8	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0	0
Cycles Maxed Out (%)	0	8	0	8	33	33
Cycles with Peds (%)	67	58	50	50	58	58

Controller Summary
Average Cycle Length (s): NA
Number of Complete Cycles : 0

USER REPORT FOR NETWORK SITE

Project: Roundabout - 2040

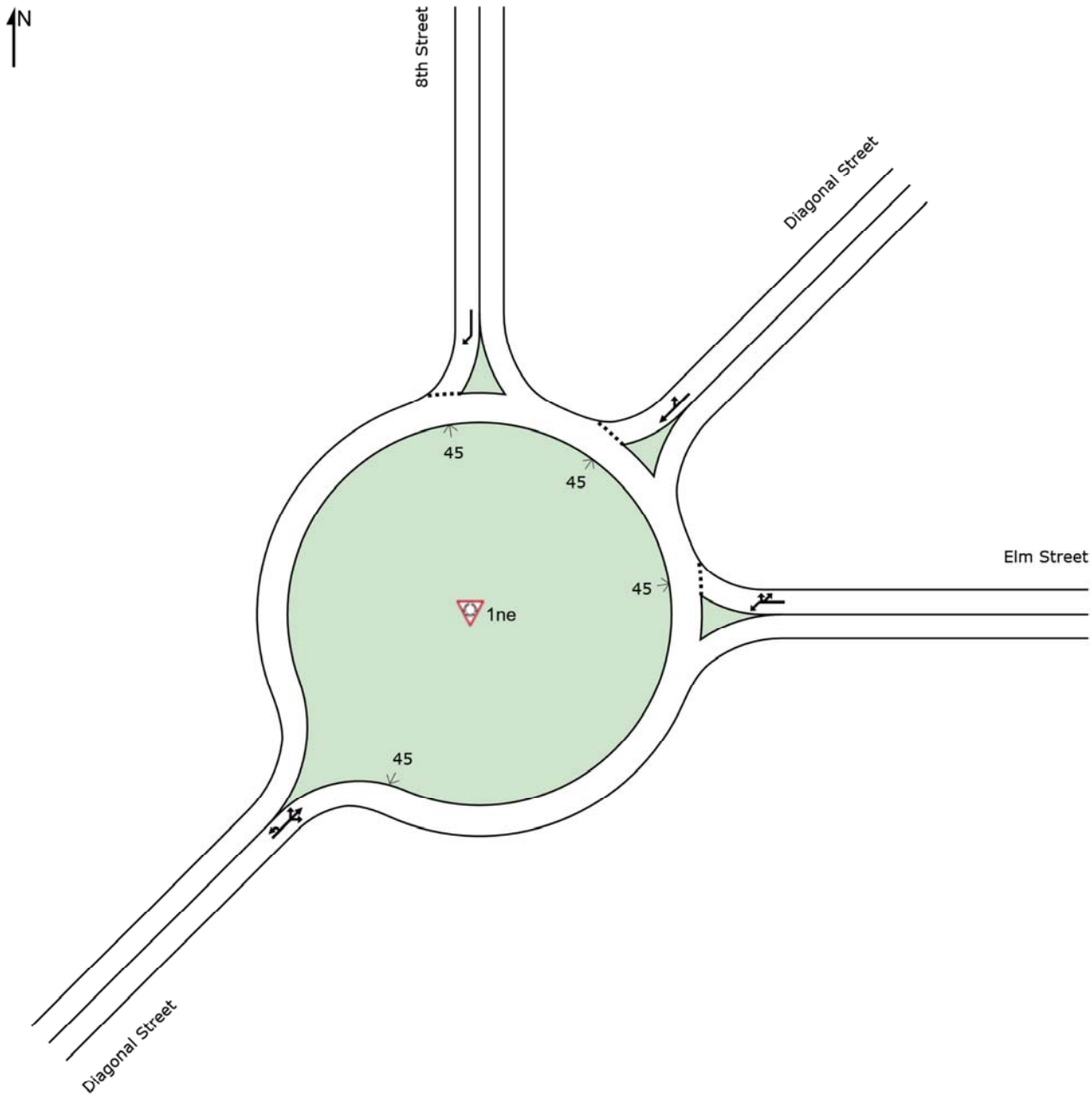
Template: Roundabout Analysis Summary by Movement (No LOS Display)

Site: 1ne [PM 2040 - NE]

Network: 2 [PM 2040]

Site Category: Peanut Roundabout
Roundabout

Site Layout



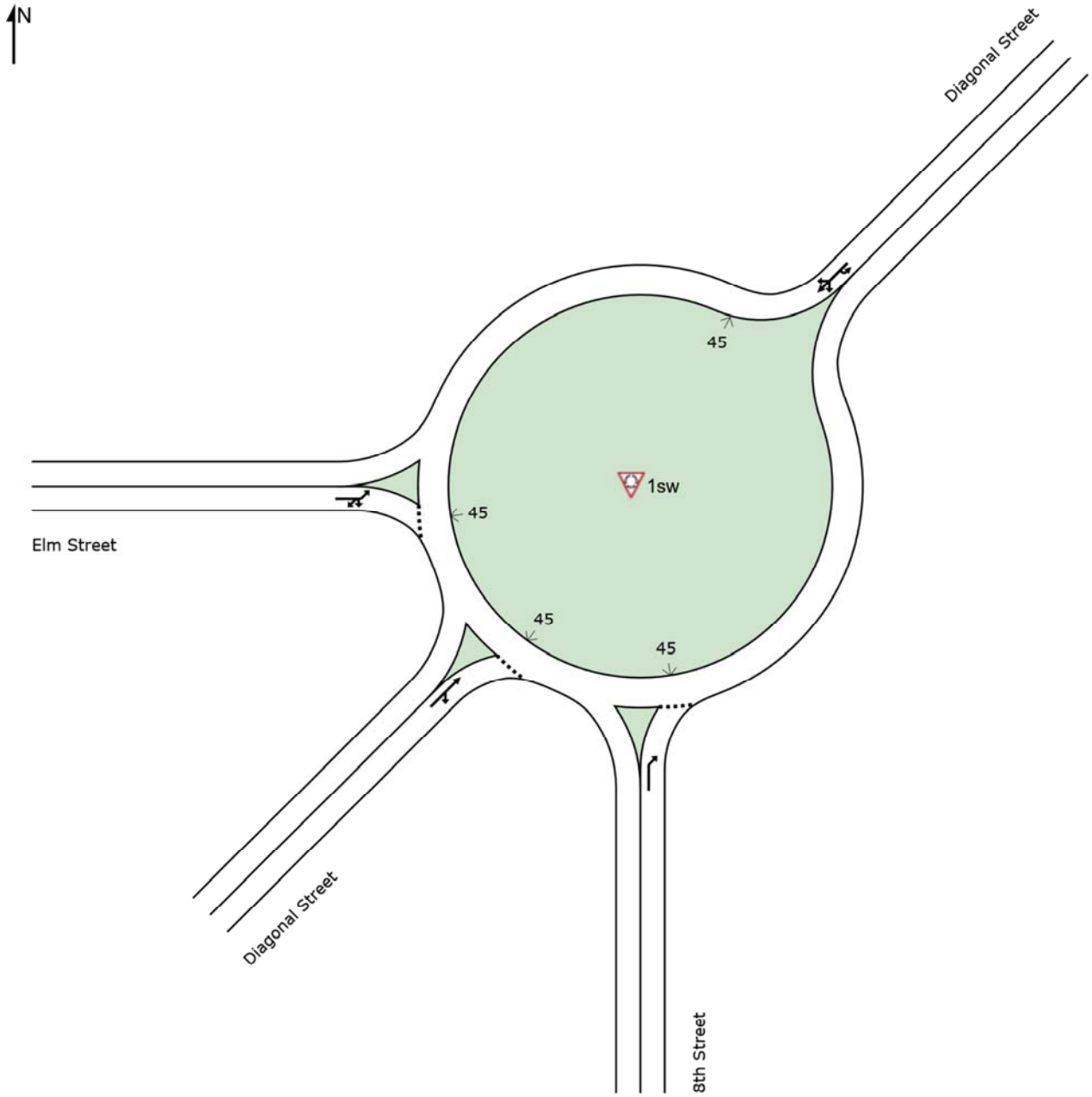
Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
East: Elm Street														
1a	L1	96	3.0	96	3.0	0.125	6.5	LOS A	0.6	15.4	0.41	0.58	0.41	22.1
16	R2	12	3.0	12	3.0	0.125	3.8	LOS A	0.6	15.4	0.41	0.58	0.41	23.4
16b	R3	2	3.0	2	3.0	0.125	4.3	LOS A	0.6	15.4	0.41	0.58	0.41	23.4
Approach		110	3.0	110	3.0	0.125	6.1	LOS A	0.6	15.4	0.41	0.58	0.41	22.4
NorthEast: Diagonal Street														
6x	T1	286	3.0	286	3.0	0.312	3.2	LOS A	1.9	49.2	0.42	0.41	0.42	22.9
16bx	R3	8	3.0	8	3.0	0.312	4.0	LOS A	1.9	49.2	0.42	0.41	0.42	23.9
Approach		294	3.0	294	3.0	0.312	3.2	LOS A	1.9	49.2	0.42	0.41	0.42	23.0
North: 8th Street														
14a	R1	24	3.0	24	3.0	0.033	4.6	LOS A	0.2	4.1	0.54	0.50	0.54	22.7
Approach		24	3.0	24	3.0	0.033	4.6	LOS A	0.2	4.1	0.54	0.50	0.54	22.7
SouthWest: Diagonal Street														
5ux	U	19	3.0	19	3.0	0.279	4.9	LOS A	0.0	0.0	0.00	0.29	0.00	17.2
5ax	L1	5	3.0	5	3.0	0.279	2.9	LOS A	0.0	0.0	0.00	0.29	0.00	25.2
2x	T1	184	3.0	184	3.0	0.279	0.9	LOS A	0.0	0.0	0.00	0.29	0.00	25.4
12ax	R1	102	3.0	102	3.0	0.279	0.7	LOS A	0.0	0.0	0.00	0.29	0.00	25.1
Approach		311	3.0	311	3.0	0.279	1.1	LOS A	0.0	0.0	0.00	0.29	0.00	25.2
All Vehicles		738	3.0	738	3.0	0.312	2.8	LOS A	1.9	49.2	0.24	0.39	0.24	23.7

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 1sw [PM 2040 - SW] Network: 2 [PM 2040]

Site Category: Peanut Roundabout
Roundabout

Site Layout



Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
South: 8th Street														
18a	R1	23	3.0	23	3.0	0.028	3.7	LOS A	0.1	3.4	0.46	0.43	0.46	23.1
Approach		23	3.0	23	3.0	0.028	3.7	LOS A	0.1	3.4	0.46	0.43	0.46	23.1
NorthEast: Diagonal Street														
1ux	U	29	3.0	29	3.0	0.382	4.9	LOS A	0.0	0.0	0.00	0.29	0.00	17.2
1ax	L1	5	3.0	5	3.0	0.382	2.9	LOS A	0.0	0.0	0.00	0.29	0.00	25.2
6x	T1	268	3.0	268	3.0	0.382	0.9	LOS A	0.0	0.0	0.00	0.29	0.00	25.4
16ax	R1	124	3.0	124	3.0	0.382	0.7	LOS A	0.0	0.0	0.00	0.29	0.00	25.1
Approach		426	3.0	426	3.0	0.382	1.1	LOS A	0.0	0.0	0.00	0.29	0.00	25.2
West: Elm Street														
5a	L1	97	3.0	97	3.0	0.139	7.2	LOS A	0.7	17.3	0.49	0.63	0.49	21.7
12	R2	11	3.0	11	3.0	0.139	4.6	LOS A	0.7	17.3	0.49	0.63	0.49	23.3
12b	R3	4	3.0	4	3.0	0.139	5.1	LOS A	0.7	17.3	0.49	0.63	0.49	23.2
Approach		112	3.0	112	3.0	0.139	6.9	LOS A	0.7	17.3	0.49	0.63	0.49	22.1
SouthWest: Diagonal Street														
2x	T1	162	3.0	162	3.0	0.180	3.1	LOS A	1.0	25.2	0.38	0.40	0.38	23.0
12bx	R3	5	3.0	5	3.0	0.180	3.8	LOS A	1.0	25.2	0.38	0.40	0.38	23.9
Approach		168	3.0	168	3.0	0.180	3.1	LOS A	1.0	25.2	0.38	0.40	0.38	23.1
All Vehicles		728	3.0	728	3.0	0.382	2.5	LOS A	1.0	25.2	0.18	0.37	0.18	24.0

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Attachment E

Signal Warrant Analysis

KELLER ASSOCIATES

HCS7 Warrants Report

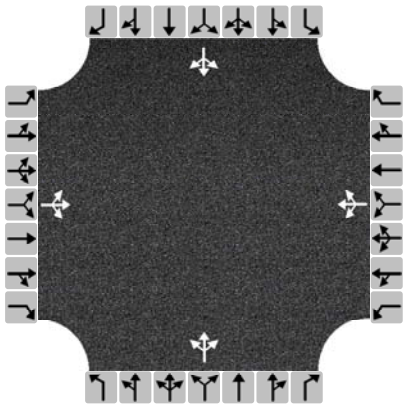
Project Information

Analyst	ASG	Date	1/9/2020
Agency	Keller Associates	Analysis Year	2020
Jurisdiction		Time Period Analyzed	7:00 AM - 7:00 PM
Project Description	Clarkston 8th & Elm		

General

Major Street Direction	North-South	Population < 10,000	No
Starting Time Interval	7	Coordinated Signal System	No
Median Type	Undivided	Crashes (crashes/year)	2
Major Street Speed (mi/h)	25	Adequate Trials of Crash Exp. Alt.	No
Nearest Signal (ft)	600		

Geometry and Traffic



Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Number of Lanes, N	0	1	0	0	1	0	0	1	0	0	1	0
Lane Usage		LTR			LTR			LTR			LTR	
Vehicle Volumes Averages (veh/h)	0	84	0	0	68	0	0	169	0	0	118	0
Pedestrian Averages (peds/h)	0			0			0			0		
Gap Averages (gaps/h)	0			0			0			0		
Delay (s/veh)	0.0			0.0			0.0			0.0		
Delay (veh-hrs)	0.0			0.0			0.0			0.0		

School Crossing and Roadway Network

Number of Students in Highest Hour	0	Two or More Major Routes	No
Number of Adequate Gaps in Period	0	Weekend Counts	No
Number of Minutes in Period	0	5-year Growth Factor (%)	5

Railroad Crossing

Grade Crossing Approach	None	Rail Traffic (trains/day)	4
Highest Volume Hour with Trains	Unknown	High Occupancy Buses (%)	0
Distance to Stop Line (ft)		Tractor-Trailer Trucks (%)	10

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HCS7 Warrants Report

Volume Summary

Hour	Major Volume	Minor Volume	Total Volume	Peds/h	Gaps/h	1A (100%)	1A (80%)	1B (100%)	1B (80%)	2 (100%)	3A (100%)	3B (100%)	4A (100%)	4B (100%)
07 - 08	211	27	251	0	0	No	No	No	No	No	No	No	No	No
08 - 09	232	52	298	0	0	No	No	No	No	No	No	No	No	No
09 - 10	230	76	353	0	0	No	No	No	No	No	No	No	No	No
10 - 11	270	80	404	0	0	No	No	No	No	No	No	No	No	No
11 - 12	314	100	472	0	0	No	No	No	No	No	No	No	No	No
12 - 13	364	102	536	0	0	No	No	No	No	No	No	No	No	No
13 - 14	302	103	502	0	0	No	No	No	No	No	No	No	No	No
14 - 15	308	104	501	0	0	No	No	No	No	No	No	No	No	No
15 - 16	310	92	480	0	0	No	No	No	No	No	No	No	No	No
16 - 17	324	98	510	0	0	No	No	No	No	No	No	No	No	No
17 - 18	347	113	549	0	0	No	No	No	No	No	No	No	No	No
18 - 19	248	109	434	0	0	No	No	No	No	No	No	No	No	No
Total	3460	1056	5290	0	0	0	0	0	0	0	0	0	0	0

Warrants

Warrant 1: Eight-Hour Vehicular Volume	
A. Minimum Vehicular Volumes (Both major approaches --and-- higher minor approach) --or--	
B. Interruption of Continuous Traffic (Both major approaches --and-- higher minor approach) --or--	
80% Vehicular --and-- Interruption Volumes (Both major approaches --and-- higher minor approach)	
Warrant 2: Four-Hour Vehicular Volume	
Four-Hour Vehicular Volume (Both major approaches --and-- higher minor approach)	
Warrant 3: Peak Hour	
A. Peak-Hour Conditions (Minor delay -- and-- minor volume --and-- total volume) --or--	
B. Peak-Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)	
Warrant 4: Pedestrian Volume	
A. Four Hour Volumes --or--	
B. One-Hour Volumes	
Warrant 5: School Crossing	
Gaps Same Period --and--	
Student Volumes	
Nearest Traffic Control Signal (optional)	✓
Warrant 6: Coordinated Signal System	
Degree of Platooning (Predominant direction or both directions)	
Warrant 7: Crash Experience	
A. Adequate trials of alternatives, observance and enforcement failed --and--	
B. Reported crashes susceptible to correction by signal (12-month period) --and--	
C. 80% Volumes for Warrants 1A, 1B, --or-- 4 are satisfied	
Warrant 8: Roadway Network	
A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2, or 3) --or--	
B. Weekend Volume (Five hours total)	
Warrant 9: Grade Crossing	
A. Grade Crossing within 140 ft --and--	
B. Peak-Hour Vehicular Volumes	

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APPENDIX C: Intersection Crash Data

MEMO

TO: Chief Hastings

FROM: Paul Purcell

SUBJECT: Traffic accidents in Diagonal and its cross streets

DATE: November 18, 2019

I have concluded the evaluation of the list of traffic accidents that have occurred on Diagonal Street and its cross streets. Each intersection is listed and the word Intersection means an accident occurred at the intersection. Other means accidents which cover accidents that occurred nearby; locations like parking lots. Injury means the number of injury accidents at an intersection.

Second and Diagonal

Intersection	5
Other	0

Third and Diagonal

Intersection	14
Other	8

Fourth and Diagonal

Intersection 9 2 of the 9 were injury accidents

Other 0

Fifth and Diagonal

Intersection 11 1 of the 11 was an injury accident

Other 2

Sixth and Diagonal

Intersection 11 and 4 of the 11 were injury accidents

Other 4

Seventh and Diagonal

Intersection 2

Other 0

Injury 0

Eighth and Diagonal

Intersection 9 and 3 of the 9 were injury accidents

Other 0

Ninth and Diagonal

Intersection 1

Other 3

Injury 0

Tenth and Diagonal

Intersection 1 and it was an injury accident

Other 0

Twelfth and Diagonal

Intersection 3 and 1 of the 3 was an injury accident

Other 3

The total intersection accident was 65, and 12 of those were injury accidents. There were 21 classified as other.

Paul Purcell 106

Incident	Nature	Area	Agency	Reported	Disposition	Complainant
14P07256	Accident NonInj	CPDA	CPD	19:55:23 12/12/14	CLO 3rd St	DEVORAK, STACY JAY ~~Bank Parking Lot~~ 3rd & Diagonal at intersec.
17P01671	Accident NonInj	CPDA	CPD	12:14:37 03/29/17	CLO 3rd St	GUZMAN CHAVEZ, SINTHIA P at intersection
17P02161	Accident NonInj	CPDA	CPD	10:58:14 04/21/17	CLO Poplar	KERNAN, TINA L at intersection
17P04937	Accident HitRun	CPDA	CPD	17:13:01 08/18/17	INA 3rd St	SARBACHER, DARLENE MARIE at intersection
17P06825	Accident NonInj	CPDA	CPD	11:02:40 11/17/17	CLO Poplar	MCLEAN, BRIAN RANDALL at intersection
18P00268	Accident HitRun	CPDA	CPD	15:04:49 01/17/18	INA 3rd St	WEBBER, DEVIN LEWIS at intersection Lain change 10-50
14P07015	Accident NonInj	CPDA	CPD	14:29:54 12/01/14	CLO	BICKFORD, KRISTINA E Bimart Parking Lot.
14P07059	Accident NonInj	CPDA	CPD	17:14:51 12/03/14	CLO 3rd St	BUEKE, MICHAEL DEAN at intersection
14P07253	Accident HitRun	CPDA	CPD	16:51:23 12/12/14	CLO Poplar	at intersection
14P07531	Accident NonInj	CPDA	CPD	11:53:11 12/27/14	CLO	SARBACHER, DARLENE MARIE Bimart Parking Lot
15P03354	Accident NonInj	CPDA	CPD	14:35:27 06/09/15	CLO	BROMLEY, ANGELA K Bimart Parking Lot
15P06330	Accident NonInj	CPDA	CPD	12:06:02 10/13/15	CLO	TETWILER, CRAIG EVAN Bimart Parking Lot
16P02654	Accident HitRun	CPDA	CPD	17:16:59 05/04/16	CLO	BUTLER, MARCIA LEA Bimart Parking Lot
16P06319	Accident NonInj	CPDA	CPD	16:12:34 10/04/16	CLO Poplar	at intersection
16P07196	Accident NonInj	CPDA	CPD	17:17:09 11/10/16	CLO 2nd St	WEEKS, MEGAN NICOLE Rear end 2nd & Diag
17P05642	Accident NonInj	CPDA	CPD	12:46:42 09/18/17	CLO 3rd St	PAYTON, ELIZABETH A at intersection
17P05901	Accident NonInj	CPDA	CPD	13:39:01 09/30/17	CLO	HOLLOWAY, RASHEL L Bimart Parking Lot
18P01083	Accident NonInj	CPDA	CPD	14:45:40 03/02/18	CLO	YONGE, CHRISTOPHER T on diagonal Pulling out of Bimart
15P05806	Accident NonInj	CPDA	CPD	12:54:28 09/18/15	CLO	Lain change on Diagonal 300 Block
16P05059	Accident HitRun	CPDA	CPD	11:06:19 08/11/16	CLO 2nd St	HUMPHERYS, PATRICIA LYA at intersection Truck hit utility Pole
17P06313	Accident NonInj	CPDA	CPD	08:03:26 10/23/17	CLO 3rd St	NARDECCHIA, PAUL DAVID at intersection
18P00048	Accident NonInj	CPDA	CPD	12:46:50 01/04/18	CLO 4th St	DEBOER, JEFFREY PAUL at intersection
18P01640	Accident NonInj	CPDA	CPD	16:15:41 03/31/18	CLO	AMYOTTE, EDNA PHILOMENE Parking Lot NAPA
19P02013	Accident NonInj	CPDA	CPD	12:15:04 04/18/19	CLO 2nd St	TIPPLE, SKYLER JOHN at intersection rear end

14

8 in A Parking Lot

Incident	Nature	Area	Agency	Reported	Disposition	Complainant
						4th & Diagonal
15P03186	Accident NonInj	CPDA	CPD	12:07:00 06/03/15	CLO 4th	in intersection
16P05839	Accident Injury	CPDA	CPD	15:22:51 09/13/16	CLO 4th	SISCHO, ROBERT C in intersection
17P06631	Accident NonInj	CPDA	CPD	13:34:45 11/07/17	CLO Poplar	STEDMAN, SUZIE RENE in intersection
17P07101	Accident NonInj	CPDA	CPD	13:29:17 12/02/17	CLO Poplar	WEBER, STEPHEN L in intersection
17P07157	Accident NonInj	CPDA	CPD	14:59:12 12/05/17	CLO 4th St	BLIMKA, MICHELLE A in intersection
18P02490	Accident NonInj	CPDA	CPD	16:17:19 05/16/18	CLO 4th St	CASSELL, JULIE ANN at stop sign 4th & Diagonal
18P06042	Accident NonInj	CPDA	CPD	11:19:55 10/24/18	CLO 4th St	DUCKWORTH, ANN B in intersection
18P06491	Accident NonInj	CPDA	CPD	09:28:54 11/16/18	CLO 4th St	FORSBERG, SHAAN DENNIS in intersection
19P04004	Accident Injury	CPDA	CPD	15:26:34 07/13/19	CLO 4th St	in intersection

Incident	Nature	Area	Agency	Reported	Disposition	Complainant
						5th & Diagonal
15P00348	Accident NonInj	CPDA	CPD	01:44:01 01/18/15	CLO5th St	JOHANSON, TIAH RENE in intersection
16P00364	Accident NonInj	CPDA	CPD	20:24:13 01/20/16	CLO5th St	DONLON, ELIZABETH ANN in intersection
16P05836	Accident NonInj	CPDA	CPD	13:55:15 09/13/16	CLO4th St	in intersection
16P06480	Accident NonInj	CPDA	CPD	17:33:10 10/10/16	CLO5th St	SANCHEZ, TERESA LYNN in intersection
17P00200	Accident NonInj	CPDA	CPD	18:54:34 01/10/17	CAA5th St	PARKER, KAYLEE in intersection
17P00284	Accident Injury	CPDA	CPD	10:50:35 01/15/17	CLO5th St	POPE, TERRY WAYNE Rear end at stop sign for Diagonal
17P02260	Accident UnkInj	CPDA	CPD	16:52:52 04/25/17	CLO	GRUBB, DENNIS JAMES Thai Garden Parking lot
18P01712	Accident NonInj	CPDA	CPD	14:43:56 04/04/18	CLO	SHOEMAKER, SUSAN GAYLE Rear end at stop sign for Diagonal
18P01850	Accident NonInj	CPDA	CPD	15:41:01 04/13/18	CLO	PHILLIPS, PAUL JOSEPH 500 block Lane change
18P02029	Accident NonInj	CPDA	CPD	12:23:19 04/24/18	INF5th St	in intersection
19P00899	Accident NonInj	CPDA	CPD	06:01:08 02/20/19	CLO5th St	MEE, ALEXIS M in intersection
19P02804	Accident NonInj	CPDA	CPD	18:31:59 05/23/19	CLO5th St	STANLEY, RONALD JAMES Rear end on 5th at stop sign
17P00499	Accident NonInj	CPDA	CPD	16:38:23 01/27/17	CLO6th St	DUGDALE, RACHEL MORIAH Rear end on 6th St at stop light

6th & Diagonal

Incident	Nature	Area	Agency	Reported	Disposition	Complainant
15P00771	Accident NonInj	CPDA	CPD	17:24:51 02/05/15	CLO 6th St	BEHLER, KEVIN DEAN Rear end on 6th at stop light
16P07687	Accident HitRun	CPDA	CPD	09:29:26 12/05/16	INA	HAENER, LAURIE ANN Emerald Garden PL
15P00546	Accident NonInj	CPDA	CPD	11:52:46 01/27/15	CLO	VALLEY TRANSIT,
15P04628	Accident Injury	CPDA	CPD	12:34:37 07/29/15	CLO 5th St	WAKEFIELD, JOSHUA MICHAEL in intersection
15P07296	Accident NonInj	CPDA	CPD	12:11:41 12/03/15	CLO 6th	FISCHER, PATTI A at 6th & maple pull out at PL,
16P01460	Accident NonInj	CPDA	CPD	07:10:24 03/14/16	CLO 6th	ROBISON, ASHLEY MARIE at intersection
16P03611	Accident NonInj	CPDA	CPD	13:28:19 06/17/16	CLO 6th St	TROUTMAN, KATHERINE A maple & 6th
16P06622	Accident Injury	CPDA	CPD	17:11:14 10/17/16	CLO 6th	at intersection
16P07408	Accident NonInj	CPDA	CPD	07:58:33 11/21/16	CLO 6th	BUTTENHOFF, JEREMY THOMAS Rear end at stop light
18P04857	Accident Injury	CPDA	CPD	15:12:58 08/30/18	CLO 6th	in intersection
19P03903	Accident Injury	CPDA	CPD	14:43:10 07/09/19	CLO 6th St	HERNANDEZ, NAT NONE Rear end at stop light
19P00354	Accident NonInj	CPDA	CPD	11:53:09 01/21/19	CLO	CHANCELLOR, BOBBI LEIGH parking spot 200 6th
15P05942	Accident NonInj	CPDA	CPD	17:12:40 09/23/15	CLO	HIEBERT, MICA JAMES 200 block 6th St Rear end
16P00578	Accident NonInj	CPDA	CPD	10:37:34 02/02/16	INA	CONOVER, GEORGE W parking lot 200 6th St
16P01532	Accident NonInj	CPDA	CPD	14:06:23 03/17/16	CAA 6th St	at intersection

8th & Elm & Diagonal 1-18-19

Incident	Nature	Area Agency	Reported	Disposition	Complainant
15P03301	Accident HitRun	CPDA CPD	02:05:46 06/08/15	CAA	BOLEWARE, MARK WILLIAM
18P03298	Accident NonInj	CPDA CPD	19:16:56 06/24/18	CLO	ERICKSON, JANI LOU
17P00069	Accident NonInj	CPDA CPD	10:40:30 01/04/17	CLO	WILLIAMS, ALETHA C
13P00483	Accident NonInj	CPDA CPD	15:12:01 01/29/13	CLO	FERGUSON, SCOTT
14P06323	Accident NonInj	CPDA CPD	14:49:18 10/27/14	CLO	ABBOTT, NOEL R
16P05297	Accident HitRun	CPDA CPD	14:16:40 08/20/16	CAA	SCOTT, SAMANTHA MARIE
13P05748	Accident HitRun	CPDA CPD	09:54:43 09/22/13	CLO	GOSSE, JESSICA ANN
18P05351	Accident HitRun	CPDA CPD	15:57:40 09/19/18	INA	BRANAM, BONNIE LEE
17P02383	Accident HitRun	CPDA CPD	10:06:10 05/01/17	INA	STUDEBAKER, JESSE J
15P05628	Accident NonInj	CPDA CPD	10:10:28 09/10/15	CLO	STARK, WADE JAMES
15P05138	Accident HitRun	CPDA CPD	11:25:35 08/18/15	INA	KAMMERS, SHAWN CARL
14P00625	Accident HitRun	CPDA CPD	14:13:35 02/07/14	CAA	ZIEGLER, WILFORD LEROY
15P00323	Accident NonInj	CPDA CPD	12:55:35 01/16/15	CLO	PALMER, JACK REED
15P07789	Accident HitRun	CPDA CPD	18:35:48 12/28/15	CLO	PETTY, CONNOR JACKSON
16P02291	Accident Injury	CPDA CPD	14:48:15 04/19/16	CLO	JABETH, SHEILA
17P00760	Accident NonInj	CPDA CPD	17:39:27 02/09/17	CLO	
17P03748	Accident Injury	CPDA CPD	17:22:48 06/29/17	CLO	
17P04106	Accident Injury	CPDA CPD	17:02:43 07/13/17	CLO	LIND, JENNIFER BROOKE
17P05413	Accident NonInj	CPDA CPD	16:57:47 09/07/17	CLO	DUGGAN, SEAN NOBLE
18P00624	Accident NonInj	CPDA CPD	11:35:02 02/05/18	CLO	ELLS, BETTY JEAN
18P05023	Accident NonInj	CPDA CPD	18:18:30 09/06/18	CLO	FERGUSON, SCOTT
13P03065	Accident HitRun	CPDA CPD	15:43:14 06/02/13	CLO	HUGHES, JENNY LOUISE
14P02978	Accident NonInj	CPDA CPD	19:02:53 06/05/14	CLO	MONTAMBO, LORRAINE JAYE

23 Accidents

3 Injury

Incident	Nature	Area	Agency	Reported	Disposition	Complainant
						9th & Diagonal
15P03301	Accident HitRun	CPDA	CPD	02:05:46 06/08/15	CAA 9th	BOLEWARE, MARK WILLIAM unsecure load DRAG on road
19P05041	Accident NonInj	CPDA	CPD	10:48:39 08/28/19	CLO 9th	WIMER, ROBERT GREGORY in intersection
19P00617	Accident HitRun	CPDA	CPD	13:12:53 02/05/19	INA	BASHAW, DAWN M 800 BL 9TH ST ~~Parking area~~
17P02383	Accident HitRun	CPDA	CPD	10:06:10 05/01/17	INA	STUDEBAKER, JESSE J 800 BL Diagonal Parked car hitRun

Incident	Nature	Area	Agency	Reported	Disposition	Complainant	
14P07312	Accident NonInj	CPDA	CPD	12:06:11 12/15/14	CLO 10th	WALSH, DANIELLE M	10th & Diagonal AT INTERSECTION
16P07374	Accident Injury	CPDA	CPD	13:58:45 11/19/16	CAA 10th	IN INTERSECTION	

8

Incident	Nature	Area	Agency	Reported	Disposition	Complainant
						12th & Chestnut
16P04442	Accident Injury	CPDA	CPD	18:01:58 07/18/16	CLO 12th	HUEBNER, ROBERT DAVID in intersection
16P03677	Accident NonInj	CPDA	CPD	07:35:49 06/20/16	CLO	BEHLER, KEVIN DEAN 1000 Block 12th improper hit parked veh.
16P07359	Accident UnkInj	CPDA	CPD	20:48:23 11/18/16	CAA 12th	KAMPF, NICHOLAS ARNETTE Over correct on Turn
17P02103	Accident NonInj	CPDA	CPD	18:16:16 04/18/17	CLO 12th	BONIVERT, RYAN JEFFREY in intersection
17P06448	Accident HitRun	CPDA	CPD	10:29:02 10/29/17	INA 10th	LANE, ROBERT JOHN Parked 1000 Blk Diag. Hit+Run
19P04427	Accident UnkInj	CPDA	CPD	11:56:32 08/01/19	CLO	KERNIN, JENESS KAHNEL Turned in to a alley from diag.

13th & Chestnut

Incident	Nature	Area	Agency	Reported	Disposition	Complainant
19P07171	Accident NonInj	CPDA	CPD	13:58:27 12/14/19	CLO	HOOPER, KADE WILLIAM
19P06914	Accident Injury	CPDA	CPD	17:22:50 12/02/19	CLO	
19P06718	Accident NonInj	CPDA	CPD	15:43:23 11/21/19	CLO	WARD, CRYSTAL ROSE
18P06054	Accident Injury	CPDA	CPD	18:13:43 10/24/18	CLO	
18P05045	Accident Injury	CPDA	CPD	18:15:05 09/07/18	CLO	HILL, MISTY BETH
18P01175	Accident NonInj	CPDA	CPD	12:38:02 03/07/18	CLO	MARVEL, SCOTT DELROY
18P01059	Accident NonInj	CPDA	CPD	18:01:46 03/01/18	CAX	SYDENHAM, TRISTAN KEITH
18P00421	Accident NonInj	CPDA	CPD	18:47:41 01/25/18	CLO	MCNEIL, TONY DEVAUN
17P07299	Accident Injury	CPDA	CPD	19:02:22 12/13/17	CLO	FREEZE, SAMANTHA A
17P06905	Accident UnkInj	CPDA	CPD	20:54:55 11/21/17	CLO	
17P05231	Accident NonInj	CPDA	CPD	16:23:05 08/31/17	CLO	KINYON, DANA SAMIRENEE
17P05184	Accident NonInj	CPDA	CPD	14:15:48 08/29/17	CLO	SPRING, GREG S
17P03020	Accident NonInj	CPDA	CPD	08:42:15 05/31/17	CLO	BRANDNER, SABRINA N
17P02648	Accident NonInj	CPDA	CPD	18:51:36 05/13/17	INF	HOLZHEIMER, DARCI M
~~17P01344~~	~~Accident UnkInj~~	~~CPDA~~	~~CPD~~	~~17:59:34 03/13/17~~	~~CAA~~	~~SCHNEIDER, TALIA CARMEN~~
17P00353	Accident NonInj	CPDA	CPD	17:58:36 01/19/17	CLO	KNELSEN, CLIFFORD P
16P05398	Accident NonInj	CPDA	CPD	08:31:49 08/25/16	CLO	DYER, TOBY LYNN
16P03462	Accident NonInj	CPDA	CPD	13:59:27 06/10/16	CLO	SPINELLI, SHANNON M
16P00103	Accident Injury	CPDA	CPD	15:25:07 01/06/16	CLO	
15P07756	Accident Injury	CPDA	CPD	16:47:49 12/26/15	CLO	
15P07041	Accident HitRun	CPDA	CPD	12:06:54 11/19/15	CAA	CHADD, KRISTAL DAWN
15P03749	Accident NonInj	CPDA	CPD	13:46:09 06/25/15	CLO	ANDERSON, CHRYSTAL J
15P03196	Accident NonInj	CPDA	CPD	16:27:22 06/03/15	CLO	AMBROSON, BRYAN JOSEPH

22 accidents
6 injury 2015-2020

13th & Highland

19 Accidents on Public Roads

1 Injury

	Incident	Nature	Area	Agency	Reported	Disposition	Complainant
Private	13P05934	Accident HitRun	CPDA	CPD	15:55:53 10/02/13	INA	MCCUNE, ANTHONY J
Private	14P03160	Accident NonInj	CPDA	CPD	16:04:50 06/12/14	CLO	FENTER, LISA G
Private	15P06044	Accident HitRun	CPDA	CPD	15:49:07 09/29/15	INA	ANDERSEN, CORINA L
Private	18P01804	Accident NonInj	CPDA	CPD	17:18:08 04/10/18	CLO	DYNES, DAKOTA MAHRYA
Private	18P03393	Accident NonInj	CPDA	CPD	13:15:17 06/29/18	CLO	
Private	16P00660	Accident NonInj	CPDA	CPD	18:49:19 02/05/16	CLO	MOORE, LACY D
Private	16P01691	Accident HitRun	CPDA	CPD	20:27:47 03/23/16	INA	ESTRADA, LISA MARIE
Private	16P02584	Accident NonInj	CPDA	CPD	07:04:38 05/02/16	CLO	HIGHLAND MARKET/IGA,
Private	16P05200	Accident HitRun	CPDA	CPD	17:59:17 08/16/16	CLO	SPENCER, CHARLES DAVID
Private	16P05982	Accident NonInj	CPDA	CPD	21:25:01 09/19/16	CLO	TAYLOR, TAMMY R
	16P07932	Accident HitRun	CPDA	CPD	15:30:31 12/16/16	INA	LENZ, ANN LEE
Private	17P00245	Accident NonInj	CPDA	CPD	15:20:31 01/13/17	CLO	RICKS FAMILY FOODS,
Private	17P01092	Accident NonInj	CPDA	CPD	20:02:36 02/27/17	CLO	VANOVER, RONNA MAY
Private	17P02458	Accident NonInj	CPDA	CPD	11:02:49 05/05/17	CLO	CLARK, CODY JAMES
Private	17P03852	Accident NonInj	CPDA	CPD	16:53:27 07/03/17	CLO	
Private	17P04868	Accident NonInj	CPDA	CPD	17:52:51 08/15/17	CLO	KOCH, LAURA ANN
Private	18P01937	Accident NonInj	CPDA	CPD	16:31:47 04/18/18	CLO	BRISCOE, TAYLOR WARREN
Private	18P02596	Accident NonInj	CPDA	CPD	14:37:14 05/21/18	CLO	EASTLUND, HEATHER L
Private	18P05593	Accident NonInj	CPDA	CPD	11:40:47 10/01/18	CLO	RASHFORD, EDWARD MILES
Private	18P06478	Accident NonInj	CPDA	CPD	15:59:25 11/15/18	CLO	HART, JAMES S
	13P01039	Accident HitRun	CPDA	CPD	19:12:51 02/28/13	CLO	DAHLEN, LAUREN NICOLE
Private	13P01141	Accident HitRun	CPDA	CPD	11:45:35 03/06/13	CLO	SHARPE, KRISTI KAY
Private	13P03124	Accident NonInj	CPDA	CPD	18:32:31 06/04/13	CAA	DESLER, MARTINE KELLY
Private	13P03285	Accident HitRun	CPDA	CPD	22:45:57 06/10/13	INA	HINES, DOUGLAS WAYNE
Private	13P05210	Accident HitRun	CPDA	CPD	12:33:47 08/30/13	INA	FRITZ, GLORIA M
Private	13P05439	Accident NonInj	CPDA	CPD	10:29:05 09/09/13	INA	THOMPSON, AMY L
Private	14P01813	Accident HitRun	CPDA	CPD	21:00:00 04/13/14	INA	GARLAND, REBECCA E
Private	14P02034	Accident NonInj	CPDA	CPD	21:16:06 04/24/14	CLO	
Private	14P03029	Accident NonInj	CPDA	CPD	13:31:40 06/07/14	CLO	SWENSON, CATHERINE L
Private	14P03786	Accident NonInj	CPDA	CPD	19:42:27 07/08/14	CLO	WELLS, JESSICA LYNETTE
Private	14P05152	Accident HitRun	CPDA	CPD	19:16:14 09/03/14	CLO	EAMES, JOLINDA CLARICE

13th & Highland

Private	14P05765	Accident NonInj	CPDA	CPD	16:21:43 09/29/14	CLO		SWENSON, CATHERINE L
Private	15P01788	Accident HitRun	CPDA	CPD	15:43:40 03/28/15	INA		TEAL, WILLIAM THURSTON
Private	15P03757	Accident NonInj	CPDA	CPD	16:19:59 06/25/15	CLO		MCKEE, SAMANTHA J
Private	15P04869	Accident NonInj	CPDA	CPD	07:45:15 08/07/15	INF		HIGHLAND MARKET/IGA,
Private	15P05842	Accident NonInj	CPDA	CPD	19:49:18 09/19/15	INA		MABIE, HEATHER ROSE
	13P00953	Accident NonInj	CPDA	CPD	13:39:15 02/24/13	CLO		
	14P02604	Accident NonInj	CPDA	CPD	12:36:56 05/20/14	INF		GOTTSCHALK, PATRICIA ANNE
Private	14P04852	Accident NonInj	CPDA	CPD	11:13:44 08/22/14	CLO		SAMS, DANIEL CARL
	14P05428	Accident NonInj	CPDA	CPD	16:50:07 09/15/14	CLO		BRADLEY, SHELLEY RENEE
	14P06089	Accident Injury	CPDA	CPD	21:51:54 10/15/14	CLO		
	15P02331	Accident NonInj	CPDA	CPD	17:19:49 04/22/15	CLO		HILTY, RONALD VERN
?	16P04955	Accident NonInj	CPDA	CPD	22:01:04 08/07/16	CLO		TWISLETON, BRAEDEN M — Vehicle Vs Dog
	16P06466	Accident NonInj	CPDA	CPD	12:09:08 10/10/16	CLO		SAMS, DAZARAY A
	16P06605	Accident HitRun	CPDA	CPD	10:24:26 10/17/16	INA		
	16P07024	Accident NonInj	CPDA	CPD	07:56:26 11/03/16	CLO		NORLAND, JEANNE PATRICIA
?	16P07931	Accident NonInj	CPDA	CPD	14:45:05 12/16/16	CLO		— Parking mislabeled
	17P00423	Accident NonInj	CPDA	CPD	15:56:14 01/23/17	CLO		ENNEKING, LANNETTE MAE
	17P00775	Accident NonInj	CPDA	CPD	15:22:20 02/10/17	CLO		SOLOM, DONALD LEROY
	17P00887	Accident NonInj	CPDA	CPD	17:39:41 02/15/17	CLO		SCHACHER, SAMUEL E
	17P02097	Accident NonInj	CPDA	CPD	16:47:13 04/18/17	CLO		KOCH, JILL R
Private	17P03783	Accident NonInj	CPDA	CPD	19:07:15 06/30/17	CAA		
	17P04267	Accident NonInj	CPDA	CPD	12:36:06 07/20/17	CLO		
	17P04288	Accident UnkInj	CPDA	CPD	10:49:19 07/21/17	INF		HASKELL, BRADLY KENNETH
	17P07184	Accident HitRun	CPDA	CPD	09:30:40 12/07/17	INA		KAMMEYER, CHRIS GLENN
	17P07451	Accident NonInj	CPDA	CPD	13:56:31 12/23/17	CLO		
Deplicate	18P05245	Accident NonInj	CPDA	CPD	12:43:05 09/15/18	CLO		YAHNEL, DAVID S
	18P06931	Accident NonInj	CPDA	CPD	14:55:58 12/10/18	CLO		TEDDER, MCKAYLE L
Parked	18P05239	Accident HitRun	CPDA	CPD	07:26:37 09/15/18	INA		MOSER, DAN PHILLIP
Parked	18P05715	Accident NonInj	CPDA	CPD	22:45:08 10/06/18	CLO		FLYNN, KASSIDY ELIZABETH
	14P05768	Accident HitRun	CPDA	CPD	18:03:10 09/29/14	INA		MEDLOCK, JEREMY DANIEL
Private	13P06563	Accident NonInj	CPDA	CPD	13:48:28 11/05/13	CLO		HUDDLESTON, RITA M
Private	13P05285	Accident NonInj	CPDA	CPD	08:56:11 09/03/13	CLO		DARNALL, DARLENE GAY

13th & Highland

Private	14P07485	Accident NonInj	CPDA	CPD	11:37:03 12/24/14	CLO	RANDLES, TAMMI PIERSON
Private	16P02255	Accident HitRun	CPDA	CPD	12:09:15 04/18/16	INA	HINKLE, SHAWN N
Private	18P02879	Accident Injury	CPDA	CPD	14:30:00 06/04/18	CLO	

13th & Chestnut

Incident	Nature	Area	Agency	Reported	Disposition	Complainant
19P07171	Accident NonInj	CPDA	CPD	13:58:27 12/14/19	CLO	HOOPER, KADE WILLIAM
19P06914	Accident Injury	CPDA	CPD	17:22:50 12/02/19	CLO	
19P06718	Accident NonInj	CPDA	CPD	15:43:23 11/21/19	CLO	WARD, CRYSTAL ROSE
18P06054	Accident Injury	CPDA	CPD	18:13:43 10/24/18	CLO	
18P05045	Accident Injury	CPDA	CPD	18:15:05 09/07/18	CLO	HILL, MISTY BETH
18P01175	Accident NonInj	CPDA	CPD	12:38:02 03/07/18	CLO	MARVEL, SCOTT DELROY
18P01059	Accident NonInj	CPDA	CPD	18:01:46 03/01/18	CAX	SYDENHAM, TRISTAN KEITH
18P00421	Accident NonInj	CPDA	CPD	18:47:41 01/25/18	CLO	MCNEIL, TONY DEVAUN
17P07299	Accident Injury	CPDA	CPD	19:02:22 12/13/17	CLO	FREEZE, SAMANTHA A
17P06905	Accident UnkInj	CPDA	CPD	20:54:55 11/21/17	CLO	
17P05231	Accident NonInj	CPDA	CPD	16:23:05 08/31/17	CLO	KINYON, DANA SAMIRENEE
17P05184	Accident NonInj	CPDA	CPD	14:15:48 08/29/17	CLO	SPRING, GREG S
17P03020	Accident NonInj	CPDA	CPD	08:42:15 05/31/17	CLO	BRANDNER, SABRINA N
17P02648	Accident NonInj	CPDA	CPD	18:51:36 05/13/17	INF	HOLZHEIMER, DARCI M
~~17P01344~~	~~Accident UnkInj~~	~~CPDA~~	~~CPD~~	~~17:59:34 03/13/17~~	~~CAA~~	~~SCHNEIDER, TALIA CARMEN~~
17P00353	Accident NonInj	CPDA	CPD	17:58:36 01/19/17	CLO	KNELSEN, CLIFFORD P
16P05398	Accident NonInj	CPDA	CPD	08:31:49 08/25/16	CLO	DYER, TOBY LYNN
16P03462	Accident NonInj	CPDA	CPD	13:59:27 06/10/16	CLO	SPINELLI, SHANNON M
16P00103	Accident Injury	CPDA	CPD	15:25:07 01/06/16	CLO	
15P07756	Accident Injury	CPDA	CPD	16:47:49 12/26/15	CLO	
15P07041	Accident HitRun	CPDA	CPD	12:06:54 11/19/15	CAA	CHADD, KRISTAL DAWN
15P03749	Accident NonInj	CPDA	CPD	13:46:09 06/25/15	CLO	ANDERSON, CHRYSTAL J
15P03196	Accident NonInj	CPDA	CPD	16:27:22 06/03/15	CLO	AMBROSON, BRYAN JOSEPH

22 accidents
6 injury 2015-2020

13th Lobby

Incident	Nature	Area	Agency	Reported	Disposition	Complainant
15P05528	Accident NonInj	CPDA	CPD	08:22:46 09/05/15	CLO	LAMPHERE, JESSICA R
16P02556	Accident NonInj	CPDA	CPD	13:51:33 04/30/16	CLO	PIERCE, RODNEY LEE
17P02543	Accident NonInj	CPDA	CPD	18:35:24 05/08/17	CLO	CHRISTOPHERSON, JANECE J
17P03523	Accident HitRun	CPDA	CPD	22:17:12 06/20/17	CAA	CARR, KATHINA MAREE
19P00156	Accident NonInj	CPDA	CPD	14:48:15 01/10/19	CLO	PFEIFER, DAVID A

12th & Highland

12 Accidents
0 injury

	Incident	Nature	Area Agency	Reported	Disposition	Complainant
No -	16P06775	Accident NonInj	CPDA CPD	14:23:32 10/24/16	CLO	
	~~07P05344~~	Accident NonInj	CPDA CPD	15:42:59 09/04/07	CLO	
	~~10P03724~~	Accident NonInj	CPDA CPD	13:07:23 07/07/10	CLO	WEILAND, JENIFER
P -	13P05494	Accident NonInj	CPDA CPD	08:46:54 09/11/13	CLO	SULLIVAN, KEVIN CHARLES
	14P04196	Accident NonInj	CPDA CPD	10:35:55 07/25/14	INA	JAGANNATH, DAVID F
	14P06888	Accident NonInj	CPDA CPD	14:21:33 11/24/14	INF	
	15P02409	Accident NonInj	CPDA CPD	15:42:38 04/27/15	CLO	MURRAY, ROBERT WILLIAM
	15P02618	Accident HitRun	CPDA CPD	08:13:57 05/08/15	RSP	BENNINGTON, SEAN EVAN
	16P05548	Accident NonInj	CPDA CPD	14:31:45 08/31/16	CLO	WILFONG, BONNIE L
	13P05892	Accident NonInj	CPDA CPD	12:21:21 09/30/13	CLO	DICKERSON, CHERI K
	16P03267	Accident HitRun	CPDA CPD	15:26:56 06/01/16	INA	DEBORD, JOELENE RUTH — Vehicle VS Child on Bike
Parked	15P02108	Accident HitRun	CPDA CPD	09:47:18 04/12/15	CLO	CAMPBELL, ERNEST AVON
	~~06P07931~~	Accident NonInj	CPDA CPD	08:00:38 12/20/06	CLO	MITCHELL, LEE
	~~07P02560~~	Accident NonInj	CPDA CPD	12:52:58 05/07/07	CLO	BROWN, JACLYN E
Wrong In	13P05047	Accident NonInj	CPDA CPD	17:25:20 08/22/13	CLO	JOHNSON, DEENA ANN
	~~05P03183~~	Accident NonInj	CPDA CPD	01:24:13 05/28/05	CLO	STEWART, JACK LARRY
Animal	16P04250	Accident HitRun	CPDA CPD	14:36:59 07/10/16	INA	RAYE, GREGORY ALAN
	18P01164	Accident NonInj	CPDA CPD	22:43:44 03/06/18	CLO	KOLSTAD, DEBORAH QUINLAN
	~~04P06718~~	Accident NonInj	CPDA CPD	15:43:24 09/29/04	CLO	
	~~05P00811~~	Accident NonInj	CPDA CPD	13:06:40 02/10/05	CLO	STEIN, CRAIG JAMES
	~~06P03541~~	Accident NonInj	CPDA CPD	14:51:46 06/14/06	CR	DEETER, STEPHEN A
	~~06P04891~~	Accident HitRun	CPDA CPD	17:51:34 08/05/06	CAA	MARTIN, ANDREA L
	~~08P02629~~	Accident NonInj	CPDA CPD	17:45:02 05/22/08	CLO	BALDWIN, JEFFREY LEE
	~~09P05678~~	Accident NonInj	CPDA CPD	03:05:41 10/31/09	CLO	PARKINS, ROBERT MICHAEL
	~~10P04043~~	Accident NonInj	CPDA CPD	12:59:58 07/21/10	CLO	COMSTOCK, KENNETH WAYNE
Private Pr	13P02116	Accident NonInj	CPDA CPD	15:13:47 04/24/13	CLO	LEWISTON POLICE DEPARTMENT,
	13P04320	Accident NonInj	CPDA CPD	12:00:47 07/23/13	CLO	MEIER, JOY L
Private Pr	15P03058	Accident HitRun	CPDA CPD	18:43:23 05/28/15	INA	WILLIAMS, STACY DOREEN
Private Pr	15P04311	Accident NonInj	CPDA CPD	01:16:35 07/16/15	CLO	
	15P00048	Accident NonInj	CPDA CPD	10:35:01 01/03/15	CLO	RENFRO, STACIE ELIZABETH
	~~05P04687~~	Accident NonInj	CPDA CPD	22:41:22 07/22/05	CLO	

12th & Highland

~~07P00861~~	Accident NonInj	CPDA CPD	07:56:44 02/15/07	CR	PORTLOCK, ROBERT LOUIS	
15P06967	Accident UnkInj	CPDA CPD	15:40:20 11/15/15	CAA	LUMLEY, DAVID LAWRENCE	
16P03970	Accident NonInj	CPDA CPD	11:11:31 07/01/16	CLO		Vehicle V.S Bike
16P07843	Accident NonInj	CPDA CPD	08:09:52 12/12/16	CLO	BLIMKA, BRETT ARLON	
~~11P04418~~	Accident HitRun	CPDA CPD	12:28:05 08/02/11	CLO	OTTMAR, KRISTI MARIE	

POPLAR & 13TH

CITY OF CLARKSTON

JURISDICTI	COUNTY	CITY	PRIMARYT	BLOCKNUM	INTERSECT	DISTFROM	MIorFT	COMPDIRE	REFERENCE	SRONLYHI	REPORTNUMB	DATE	TIME	MOSTSEVERE
City Street	Asotin	Clarkston	POPLAR ST	1200		75	F	E	13TH ST	No	E322166	4/18/2014	13:05	Possible Injury

MAPLE & 13TH

CITY OF CLARKSTON

JURISDICTI	COUNTY	CITY	PRIMARYT	BLOCKNUM	INTERSECT	DISTFROM	MIorFT	COMPDIRE	REFERENCE	SRONLYHI	REPORTNUMB	DATE	TIME	MOSTSEVERE
City Street	Asotin	Clarkston	13TH ST	600	MAPLE ST	0				No	E388009	12/23/2014	4:52	Unknown
City Street	Asotin	Clarkston	13TH ST	0	MAPLE ST	0				No	E709168	8/20/2017	11:29	No Apparent Injury
City Street	Asotin	Clarkston	MAPLE ST	1300	13TH ST	0				No	E327649	5/9/2014	15:49	Possible Injury
City Street	Asotin	Clarkston	MAPLE ST	1300		65	F	W	13TH ST	No	E784900	4/2/2018	12:47	No Apparent Injury

JURISDICTI	COUNTY	CITY	PRIMARYT	BLOCKNUM	INTERSECT	DISTFROM	MIorFT	COMPDIRE	REFERENCE	SRONLYHI	REPORTNUMB	DATE	TIME	MOSTSEVERE

ELM & 13TH

CITY OF CLARKSTON

JURISDICTI	COUNTY	CITY	PRIMARYT	BLOCKNUM	INTERSECT	DISTFROM	MIorFT	COMPDIRE	REFERENCE	SRONLYHI	REPORTNUMB	DATE	TIME	MOSTSEVERE
City Street	Asotin	Clarkston	13TH ST	700	ELM ST	0				No	E400109	2/10/2015	4:37	No Apparent Injury
City Street	Asotin	Clarkston	13TH ST	0	ELM ST	0				No	E608258	11/14/2016	18:25	Suspected Minor Injury
City Street	Asotin	Clarkston	13TH ST	0	ELM ST	0				No	E694922	7/22/2017	16:14	Possible Injury
City Street	Asotin	Clarkston	13TH ST	0	ELM ST	0				No	E789192	4/13/2018	17:39	No Apparent Injury
City Street	Asotin	Clarkston	13TH ST	0	ELM ST	0				No	E789194	4/16/2018	13:58	No Apparent Injury
City Street	Asotin	Clarkston	13TH ST	700		106	F	N	ELM ST	No	E520961	3/2/2016	7:22	No Apparent Injury
City Street	Asotin	Clarkston	13TH ST	700		63	F	S	ELM ST	No	E780788	3/19/2018	16:19	No Apparent Injury
City Street	Asotin	Clarkston	ELM ST	1300	13TH ST	0				No	E554062	6/9/2016	15:03	No Apparent Injury
City Street	Asotin	Clarkston	ELM ST	0	13TH ST	0				No	E747439	12/13/2017	2:53	Suspected Minor Injury
City Street	Asotin	Clarkston	ELM ST	1300		40	F	W	13TH ST	No	E611546	11/21/2016	16:31	No Apparent Injury

SYCAMORE & 13TH

CITY OF CLARKSTON

JURISDICTI	COUNTY	CITY	PRIMARYT	BLOCKNUM	INTERSECT	DISTFROM	MIorFT	COMPDIRE	REFERENCE	SRONLYHI	REPORTNUMB	DATE	TIME	MOSTSEVERE
City Street	Asotin	Clarkston	13TH ST	700	SYCAMOR	0				No	E358449	9/21/2014	13:19	Unknown
City Street	Asotin	Clarkston	13TH ST	700	SYCAMOR	0				No	E402100	2/17/2015	5:48	No Apparent Injury
City Street	Asotin	Clarkston	13TH ST	700	SYCAMOR	0				No	E598444	10/13/2016	12:23	No Apparent Injury
City Street	Asotin	Clarkston	13TH ST	800		0.1	M	N	CHESTNUT S	No	E485655	11/19/2015	12:05	No Apparent Injury
City Street	Asotin	Clarkston	13TH ST	700		97	F	N	SYCAMORE S	No	E625879	12/7/2016	4:35	No Apparent Injury
City Street	Asotin	Clarkston	13TH ST	800		61	F	S	SYCAMORE S	No	E787464	4/7/2018	7:53	No Apparent Injury
City Street	Asotin	Clarkston	13TH ST	1300		25	F	N	SYCAMORE S	No	E795658	5/7/2018	9:37	No Apparent Injury
City Street	Asotin	Clarkston	SYCAMOR	1300	13TH ST	0				No	E562687	6/30/2016	12:40	No Apparent Injury

CHESTNUT & 13TH

CITY OF CLARKSTON

JURISDICTI	COUNTY	CITY	PRIMARYT	BLOCKNUM	INTERSECT	DISTFROM	MIorFT	COMPDIRE	REFERENCE	SRONLYHI	REPORTNUMB	DATE	TIME	MOSTSEVERE
City Street	Asotin	Clarkston	13TH ST		CHESTNUT	0				No	E395482	1/22/2015	17:20	No Apparent Injury
City Street	Asotin	Clarkston	13TH ST	900	CHESTNUT	0				No	E437051	6/25/2015	13:45	No Apparent Injury
City Street	Asotin	Clarkston	13TH ST	900	CHESTNUT	0				No	E505015	12/26/2015	16:46	Possible Injury
City Street	Asotin	Clarkston	13TH ST	0	CHESTNUT	0				No	E671338	5/13/2017	18:48	No Apparent Injury
City Street	Asotin	Clarkston	13TH ST	0	CHESTNUT	0				No	E711027	8/31/2017	16:21	No Apparent Injury
City Street	Asotin	Clarkston	13TH ST	0	CHESTNUT	0				No	E747440	12/13/2017	19:01	Suspected Minor Injury
City Street	Asotin	Clarkston	13TH ST	0	CHESTNUT	0				No	E764005	1/25/2018	18:47	No Apparent Injury
City Street	Asotin	Clarkston	13TH ST	0	CHESTNUT	0				No	E778459	3/1/2018	18:00	No Apparent Injury
City Street	Asotin	Clarkston	13TH ST	0	CHESTNUT	0				No	E778606	3/7/2018	12:35	No Apparent Injury
City Street	Asotin	Clarkston	13TH ST	800		114	F	N	CHESTNUT S	No	E654637	3/13/2017	17:58	Possible Injury
City Street	Asotin	Clarkston	CHESTNUT	900	13TH ST	0				No	E430468	6/3/2015	16:24	No Apparent Injury
City Street	Asotin	Clarkston	CHESTNUT	900	13TH ST	0				No	E503242	1/6/2016	15:24	Suspected Minor Injury
City Street	Asotin	Clarkston	CHESTNUT	900	13TH ST	0				No	E577690	8/25/2016	8:30	No Apparent Injury
City Street	Asotin	Clarkston	CHESTNUT	0	13TH ST	0				No	E634785	1/19/2017	17:57	No Apparent Injury
City Street	Asotin	Clarkston	CHESTNUT	0	13TH ST	0				No	E740830	11/21/2017	20:54	No Apparent Injury
City Street	Asotin	Clarkston	CHESTNUT	900		100	F	E	13TH ST	No	E336948	6/23/2014	16:43	No Apparent Injury

LIBBY & 13TH

CITY OF CLARKSTON

JURISDICTI	COUNTY	CITY	PRIMARYT	BLOCKNUM	INTERSECT	DISTFROM	MIorFT	COMPDIRE	REFERENCE	SRONLYHI	REPORTNUMB	DATE	TIME	MOSTSEVERE
City Street	Asotin	Clarkston	13TH ST		LIBBY ST	0				No	E362353	10/5/2014	13:54	No Apparent Injury
City Street	Asotin	Clarkston	13TH ST		LIBBY ST	0				No	E458715	9/5/2015	8:19	No Apparent Injury
City Street	Asotin	Clarkston	13TH ST	1210		75	F	S	LIBBY	No	E344374	7/27/2014	9:20	No Apparent Injury
City Street	Asotin	Clarkston	13TH ST	1200		50	F	S	LIBBY ST	No	E345251	7/26/2014	2:46	No Apparent Injury
City Street	Asotin	Clarkston	13TH ST	1100		138	F	N	LIBBY ST	No	E683864	6/20/2017	22:15	Possible Injury
City Street	Asotin	Clarkston	LIBBY ST	1300	13TH ST	0				No	E671337	5/8/2017	18:35	Possible Injury

JURISDICTI	COUNTY	CITY	PRIMARYT	BLOCKNUM	INTERSECT	DISTFROM	MIorFT	COMPDIRE	REFERENCE	SRONLYHI	REPORTNUMB	DATE	TIME	MOSTSEVERE
County Road	Asotin		4360							No	E540016	4/30/2016	13:45	No Apparent Injury

HIGHLAND & 13TH

CITY OF CLARKSTON

JURISDICTI	COUNTY	CITY	PRIMARYT	BLOCKNUM	INTERSECT	DISTFROM	MIorFT	COMPDIRE	REFERENCE	SRONLYHI	REPORTNUMB	DATE	TIME	MOSTSEVERE
City Street	Asotin	Clarkston	13TH ST		HIGHLAND	0				No	E365147	10/15/2014	21:50	Possible Injury
City Street	Asotin	Clarkston	13TH ST		HIGHLAND	0				No	E635816	1/23/2017	15:56	No Apparent Injury
City Street	Asotin	Clarkston	13TH ST		HIGHLAND	0				No	E418507	4/22/2015	17:20	No Apparent Injury
City Street	Asotin	Clarkston	13TH ST		HIGHLAND	0				No	E597170	10/10/2016	12:05	No Apparent Injury

City Street	Asotin	Clarkston	13TH ST	1300	HIGHLAND	0				No	E603904	11/3/2016	7:56	No Apparent Injury
City Street	Asotin	Clarkston	13TH ST	1400		113	F	N	HIGHLAND A	No	E663574	4/18/2017	16:47	No Apparent Injury
City Street	Asotin	Clarkston	HIGHLAND	1300	13TH ST	0				No	E329001	5/20/2014	12:34	Unknown
City Street	Asotin	Clarkston	HIGHLAND		13TH ST	0				No	E621701	12/16/2016	15:28	No Apparent Injury
City Street	Asotin	Clarkston	HIGHLAND		13TH ST	0				No	E697586	7/21/2017	10:49	No Apparent Injury
City Street	Asotin	Clarkston	HIGHLAND		13TH ST	0				No	E754196	12/23/2017	13:54	No Apparent Injury

JURISDICTI	COUNTY	CITY	PRIMARYT	BLOCKNUM	INTERSECT	DISTFROM	MIorFT	COMPDIRI	REFERENCEF	SRONLYHI	REPORTNUMB	DATE	TIME	MOSTSEVERE

8TH & ELM

CITY OF CLARKSTON

JURISDICTI	COUNTY	CITY	PRIMARYT	BLOCKNUM	INTERSECT	DISTFROM	MIorFT	COMPDIRI	REFERENCEF	SRONLYHI	REPORTNUMB	DATE	TIME	MOSTSEVERE
City Street	Asotin	Clarkston	8TH ST	700	DIAGONAL	0				No	E392781	1/16/2015	12:55	No Apparent Injury
City Street	Asotin	Clarkston	DIAGONAL	800		55	F	SW	ELM ST	No	E691087	7/13/2017	16:58	Possible Injury
City Street	Asotin	Clarkston	ELM ST	700	8TH ST	0				No	E539680	4/19/2016	14:48	No Apparent Injury
City Street	Asotin	Clarkston	ELM ST	0	DIAGONAL	0				No	E644262	2/9/2017	17:38	No Apparent Injury
City Street	Asotin	Clarkston	ELM ST	0	DIAGONAL	0				No	E686592	6/29/2017	17:22	Suspected Minor Injury
City Street	Asotin	Clarkston	ELM ST	0	DIAGONAL	0				No	E709452	9/7/2017	16:56	No Apparent Injury