FELSBURG HOLT & ULLEVIG
connecting & enhancing communities

October 2, 2018

MEMORANDUM

TO: Jon Brown, PE
City of Harrisburg Engineer
Stockwell Engineers, Inc.
801 N. Phillips Ave. #100
Sioux Falls, SD 57104

FROM: Mark Meisinger, PE, PTOE
Felsburg Holt & Ullevig

SUBJECT: Harrisburg Intersection Traffic Control Evaluation
FHU Reference No. 18-333

Felsburg Holt & Ullevig (FHU) has evaluated Manual on Uniform Traffic Control Devices (MUTCD) traffic signal warrants, all-way stop control warrants, and capacity analysis at four intersections in Harrisburg, South Dakota. The evaluation is based upon traffic counts conducted in August 2018.

The following intersections were evaluated:

- Cliff Avenue (475th Avenue) & 272nd Street
- Cliff Avenue (475th Avenue) & Industrial Drive / Laura Street
- Cliff Avenue (475th Avenue) & Willow Street (273rd Street)
- Tiger Way (High School Drive) & Willow Street (273rd Street)

Roadway Geometrics

A site visit was conducted on August 29, 2018. In the study area, both Cliff Avenue and Willow Street are generally two-lane roadways with 35 miles per hour (MPH) speed limits, and auxiliary lanes are provided in select locations.

The intersections of Cliff Avenue with 272nd Street and Cliff Avenue with Industrial Drive / Laura Street are controlled with stop signs on the minor approaches. An auxiliary left-turn lane is provided on the westbound approach of both intersections.

The intersection of Cliff Avenue with Willow Street is controlled with an all-way stop. Auxiliary left-turn lanes are provided on the northbound and southbound approaches of the intersection.

The intersection of Willow Street with Tiger Way is controlled with a traffic signal. The signal was pre-timed and running a 125-second cycle with two-phase operation. An auxiliary right-turn lane was provided on the westbound approach; the southbound approach had exclusive left-turn and right-turn lanes. A pedestrian crossing is provided on the east leg of the intersection with markings, pedestrian pushbuttons and pedestrian signal heads.

Data Collection

MNRG conducted turning movement counts at the study intersections via video camera technology. A 24-hour turning movement count was conducted at the intersection of Cliff Avenue with Willow Street from 7:00 PM on Wednesday, August 29, 2018 to 7:00 PM Thursday, August 30, 2018. 8-hour turning

movement counts were conducted at the other three study intersections on Thursday, August 30, 2018. The study area AM peak hour was determined to be 7:00 AM to 8:00 AM and the PM peak hour was 5:00 PM to 6:00 PM. The traffic count data was summarized and is attached. **Figure 1** depicts AM and PM peak hour traffic volumes at each of the study intersections.

MUTCD Traffic Control Device Warrant Evaluation

A review of the study intersections was performed to determine if Manual on Traffic Control Devices (MUTCD) traffic signalization Warrant 1 – Eight-Hour Vehicular Volume, Warrant 2 – Four-Hour Vehicular Volume, and all-way stop sign warrants are satisfied under existing (2018) traffic volumes. The intersections were evaluated as having a low-speed major-streets in an isolated community of 10,000 population or less. 100% of right turn volumes are included in the analysis. The results of the MUTCD warrant analysis are summarized in **Table 1**.

Table 1. Results of 2018 Existing MUTCD Warrant Analysis

Intersection	Year	Warrant 1			Warrant 2	All-Way Stop
		A	B	A&B		
Cliff Ave & 272nd St	2018	NO	NO	NO	NO	NO
Cliff Ave & Industrial / Laura	2018	NO	NO	NO	YES	NO
Cliff Ave & Willow St	2018	NO	NO	NO	YES	YES
Willow St & Tiger Way*	2018	NO	NO	NO	NO	NO

*NA Not Applicable – Not Analyzed * Existing Signal*

Based on 2018 data, none of the evaluated MUTCD warrants were satisfied at the intersections of Cliff Avenue with 272nd Street or Willow Street with Tiger Way. At the intersection of Cliff Avenue with Industrial Drive / Laura Street, MUTCD Warrant 2 was satisfied. At the intersection of Cliff Avenue with Willow Street, MUTCD Warrant 2 and the All-Way Stop Warrant were satisfied. Detailed MUTCD warrant worksheets for each intersection are attached.

Note, an evaluation of crash data was not performed as part of this study, and therefore MUTCD Traffic Signal Warrant 7 (Crash History) was not evaluated.

Operational Analysis

An operational analysis was conducted using Synchro Version 10 and SIDRA INTERSECTION Version 8 software programs to obtain results based on the methodologies described in the *Highway Capacity Manual, Sixth Edition: A Guide for Multimodal Mobility Analysis (HCM)*, Transportation Research Board, October 2016. From the analyses, a key measure or "level of service" rating of the traffic operational condition was obtained. In general, level of service (LOS) is a qualitative assessment of traffic operational conditions within a traffic stream in terms of the average stopped delay per vehicle at a controlled intersection. For rural roadways in South Dakota, LOS B or better is generally accepted as the goal for traffic operations. The operations goal for urban roadways is generally LOS C.

Several traffic control alternatives were analyzed at each intersection in addition to the existing control types. **Figure 1** summarizes the 2018 existing traffic operations at each intersection. The alternatives included two-way stop control, all-way stop control, traffic signalization (if warranted), and single lane roundabouts. **Figures 2 through 5** show the lane geometry, traffic control, and levels of service for 2018 existing traffic conditions and the other traffic control alternatives at each of the study intersections.

As shown in **Figure 2**, at the two-way stop-controlled intersection of Cliff Avenue with 272nd Street, all movements currently operate at LOS C or better during the AM and PM peak periods. As a single-lane roundabout, the intersection would be expected to operate at LOS A or B at all movements in the peak periods. All-way stop control and traffic signalization were not evaluated as the warrants were not satisfied for 2018 traffic volumes.

As shown in **Figure 3**, at the two-way stop-controlled intersection of Cliff Avenue with Industrial Drive / Laura Street, all movements currently operate at LOS C or better during the AM and PM peak periods. With traffic signalization, LOS A operations would be expected in the peak periods. As a single-lane roundabout, the intersection would be expected to operate at LOS A or B at all movements in the peak periods.

As shown in **Figure 4**, the all-way stop-controlled intersection of Cliff Avenue with Willow Street, the eastbound and westbound movements currently operate at LOS E or F during the AM and PM peak periods. An all-way scenario with additional auxiliary turn lanes on the eastbound and westbound movements was evaluated; LOS D operations would still be expected with that configuration. With traffic signalization, LOS A or B operations would be expected in the peak periods. As a single-lane roundabout, the intersection would be expected to operate at LOS A or B at all movements in the peak periods with one exception; the westbound movement would be expected to operate at LOS C in the AM peak period.

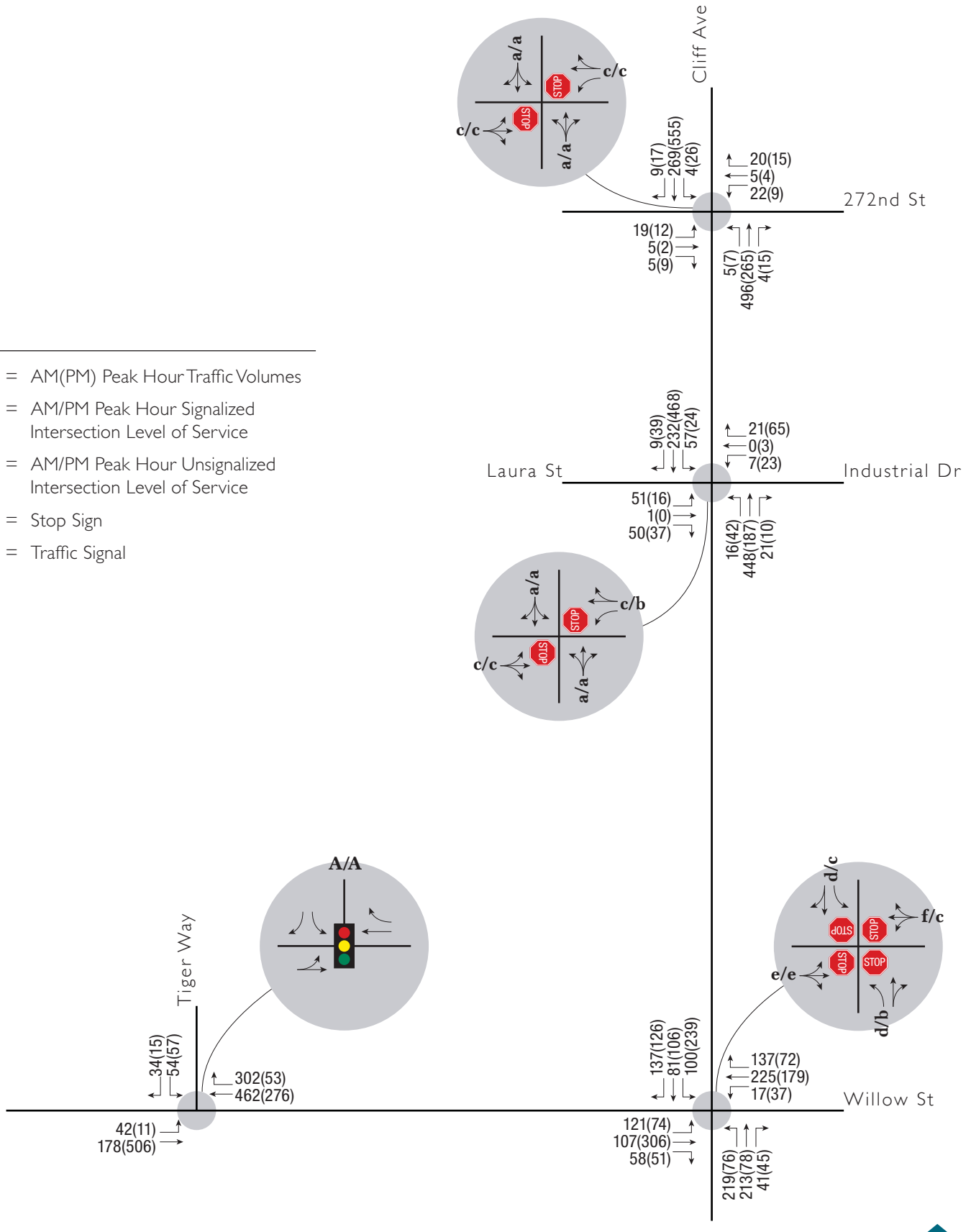
As shown in **Figure 5**, the signalized intersection of Willow Street with Tiger Way currently operates at LOS A during the AM and PM peak periods. As a single-lane roundabout, the intersection would be expected to operate at LOS A or B at all movements in the peak periods. All-way stop control was not evaluated as the warrant was not satisfied for 2018 traffic volumes.

Summary and Recommendations

At the intersections of Cliff Avenue with 272nd Street and Cliff Avenue with Industrial Drive / Laura Street, the existing two-way stop control functions with acceptable operations in the AM and PM peak periods. Traffic control modifications are not recommended at this time. These intersections should be monitored as traffic growth increases in the study area to determine if a traffic control change would be appropriate in the future.

At the intersection of Cliff Avenue with Willow Street, LOS E and F operations are currently experience with the existing all-way stop control. Long queues were observed on the westbound approach in the AM peak period, and the eastbound approach in the PM peak period. Additional auxiliary turn lanes on Willow Street would be expected to improve peak period operations to LOS D, which does not meet the South Dakota urban roadway operations goal of LOS C. Upgrades to the intersection as either a traffic signal or a single lane roundabout are recommended to achieve LOS C or better operations in the future. If a traffic signal is installed, it is recommended that auxiliary left-turn lanes be constructed on the eastbound and westbound approached based on observed traffic movements. This intersection is a logical location for a roundabout based on the characteristics of the surrounding roadway network and land uses, and a roundabout would serve as a traffic calming feature in the area.

At the intersection of Willow Street with Tiger Way, the existing traffic signal functions with acceptable operations in the AM and PM peak periods. Although MUTCD traffic signal warrants were not satisfied with 2018 volumes, traffic control modifications are not recommended at this time. The traffic signal could be upgraded to provide detection and signal timing changes to improve operational efficiency; this could be achieved by adding detection to the southbound approach and setting the Willow Street approaches to recall. The intersection should be monitored as traffic growth increases in the study area to determine if addition of an eastbound auxiliary left-turn lane would be appropriate in the future.



LEGEND

XXX(XXX)	=	AM(PM) Peak Hour Traffic Volumes
X/X	=	AM/PM Peak Hour Signalized Intersection Level of Service
x/x	=	AM/PM Peak Hour Unsignalized Intersection Level of Service
STOP	=	Stop Sign
	=	Traffic Signal

NORTH

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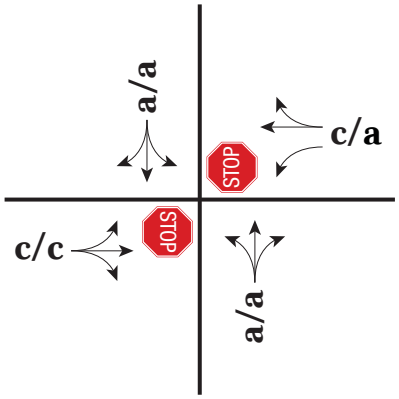
2018 Traffic Conditions
Traffic Operations

Harrisburg Intersections 18-333 10/2/18

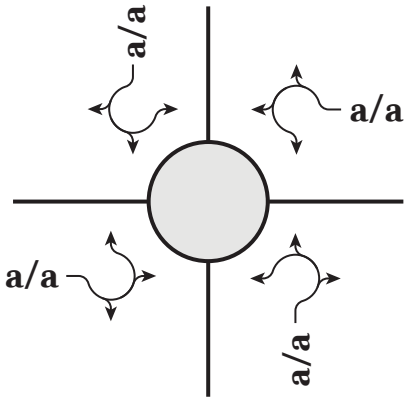
FIGURE 1

2018

Existing Two-way Stop



Single Lane Roundabout



LEGEND

X/X	=	AM/PM Peak Hour Intersection Level of Service
x/x	=	AM/PM Peak Hour Approach Level of Service
STOP	=	Stop Sign
	=	Roundabout

NORTH

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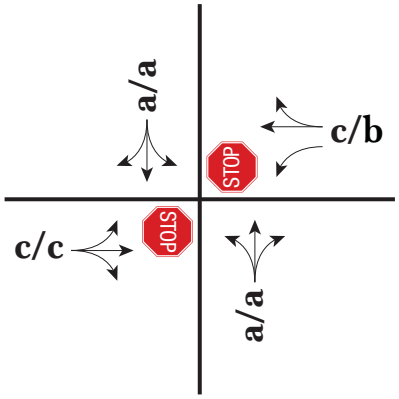
Cliff Ave & 272nd Traffic Operations

Harrisburg Intersections 18-333 10/2/18

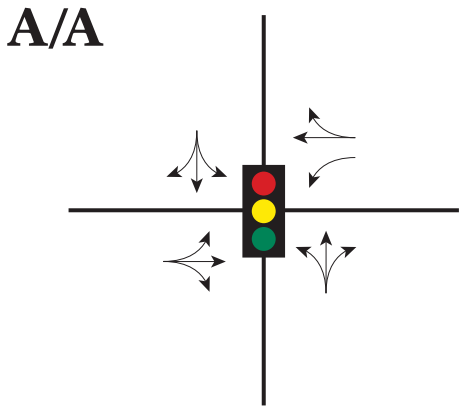
FIGURE 2

2018

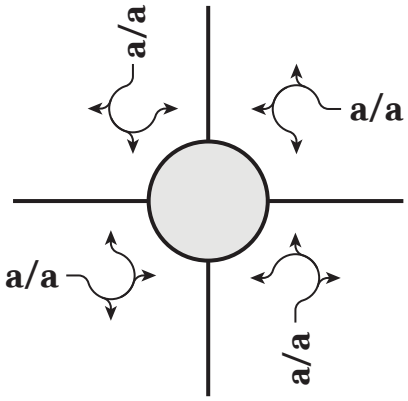
Existing Two-way Stop



Traffic Signal



Single Lane Roundabout



LEGEND

X/X	=	AM/PM Peak Hour Intersection Level of Service
x/x	=	AM/PM Peak Hour Approach Level of Service
STOP	=	Stop Sign
	=	Traffic Signal
	=	Roundabout

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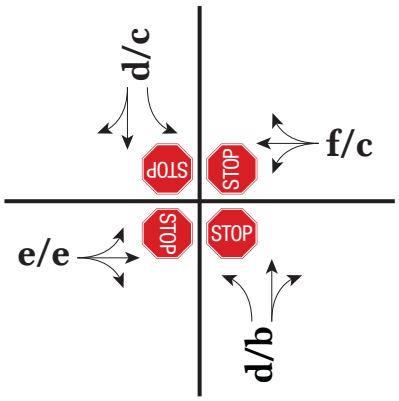
Cliff Ave & Industrial/Laura
Traffic Operations

Harrisburg Intersections 18-333 10/2/18

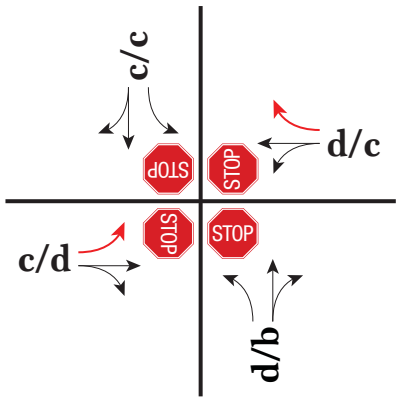
FIGURE 3

2018

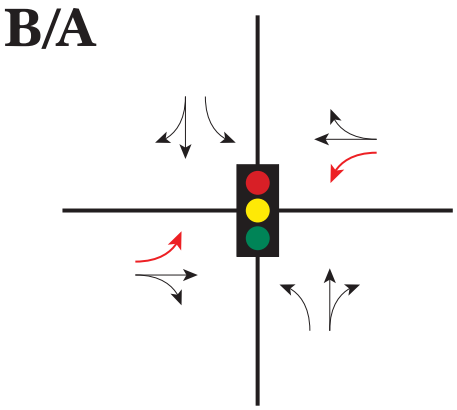
Existing All-Way Stop



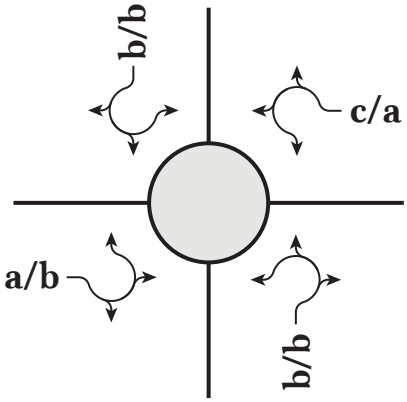
All-Way Stop with Additional Lanes



Traffic Signal with Additional Lanes



Single Lane Roundabout



LEGEND

X/X	=	AM/PM Peak Hour Intersection Level of Service
x/x	=	AM/PM Peak Hour Approach Level of Service
STOP	=	Stop Sign
	=	Traffic Signal
	=	Roundabout
	=	Additional Lanes

NORTH

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Willow Street & Cliff Avenue Traffic Operations

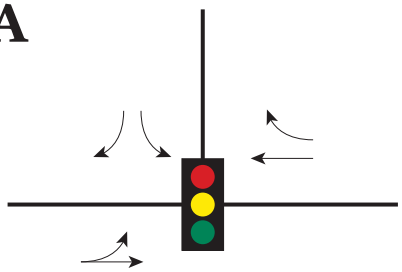
Harrisburg Intersections 18-333 10/2/18

FIGURE 4

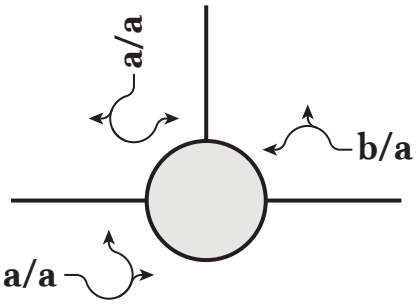
2018

Existing Traffic Signal

A/A



Single Lane Roundabout



LEGEND

X/X	=	AM/PM Peak Hour Intersection Level of Service
x/x	=	AM/PM Peak Hour Approach Level of Service
	=	Traffic Signal
	=	Roundabout

NORTH

FELSBURG HOLT & ULLEVIG

Willow Street & Tiger Way Traffic Operations

Harrisburg Intersections 18-333 10/2/18

FIGURE 5

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Cliff Ave & 272nd St
Site Code: 1
Start Date: 08/30/2018

Turning Movement Data

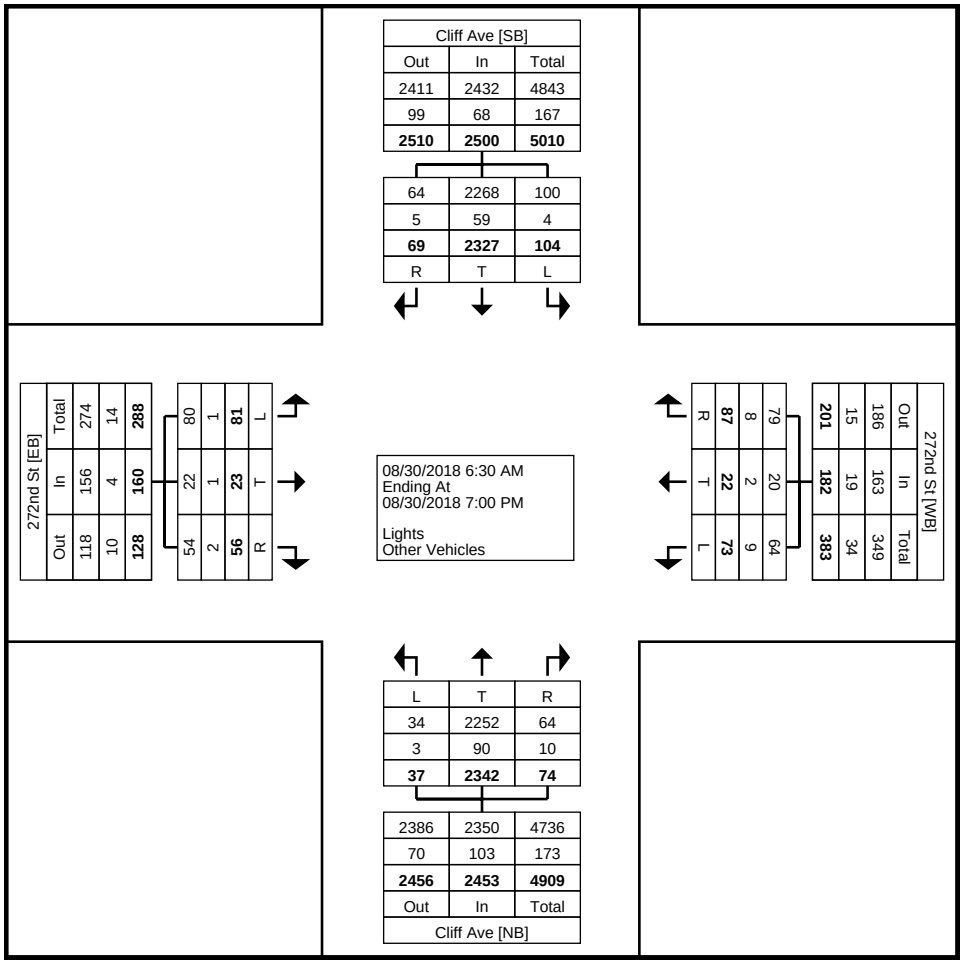
Start Time	272nd St Eastbound				272nd St Westbound				Cliff Ave Northbound				Cliff Ave Southbound				
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
6:30 AM	7	0	0	7	2	1	2	5	1	74	1	76	4	84	0	88	176
6:45 AM	6	0	1	7	2	1	6	9	0	75	5	80	3	150	2	155	251
Hourly Total	13	0	1	14	4	2	8	14	1	149	6	156	7	234	2	243	427
7:00 AM	3	0	0	3	4	1	7	12	1	101	1	103	0	47	3	50	168
7:15 AM	7	1	0	8	12	1	6	19	2	159	2	163	1	68	2	71	261
7:30 AM	4	1	1	6	6	1	4	11	2	141	0	143	2	82	2	86	246
7:45 AM	5	3	4	12	0	2	3	5	0	95	1	96	1	72	2	75	188
Hourly Total	19	5	5	29	22	5	20	47	5	496	4	505	4	269	9	282	863
8:00 AM	3	1	0	4	2	0	6	8	0	87	1	88	1	46	1	48	148
8:15 AM	0	0	2	2	1	1	1	3	1	70	2	73	3	31	1	35	113
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	3	1	2	6	3	1	7	11	1	157	3	161	4	77	2	83	261
11:30 AM	1	1	3	5	2	0	1	3	3	39	2	44	0	30	1	31	83
11:45 AM	2	0	1	3	1	1	1	3	1	37	0	38	3	33	3	39	83
Hourly Total	3	1	4	8	3	1	2	6	4	76	2	82	3	63	4	70	166
12:00 PM	0	0	0	0	5	1	3	9	2	48	1	51	7	29	0	36	96
12:15 PM	1	0	3	4	0	0	2	2	0	43	4	47	2	29	1	32	85
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	1	0	3	4	5	1	5	11	2	91	5	98	9	58	1	68	181
2:00 PM	2	0	1	3	2	0	1	3	0	36	4	40	2	32	0	34	80
2:15 PM	0	0	1	1	3	1	2	6	0	43	1	44	1	44	1	46	97
2:30 PM	0	1	0	1	2	0	2	4	0	66	3	69	0	39	1	40	114
2:45 PM	3	0	2	5	1	0	3	4	0	74	1	75	4	60	0	64	148
Hourly Total	5	1	4	10	8	1	8	17	0	219	9	228	7	175	2	184	439
3:00 PM	1	1	1	3	2	1	2	5	2	93	2	97	3	71	1	75	180
3:15 PM	2	3	1	6	1	0	2	3	0	101	3	104	3	72	2	77	190
3:30 PM	2	2	2	6	1	0	2	3	2	104	4	110	2	60	1	63	182
3:45 PM	0	0	1	1	3	1	0	4	0	61	1	62	1	62	2	65	132
Hourly Total	5	6	5	16	7	2	6	15	4	359	10	373	9	265	6	280	684
4:00 PM	4	1	2	7	3	2	3	8	1	101	2	104	1	76	0	77	196
4:15 PM	1	0	1	2	3	1	2	6	1	105	6	112	7	84	2	93	213
4:30 PM	1	1	4	6	0	2	2	4	2	96	4	102	4	88	6	98	210
4:45 PM	2	2	5	9	3	0	3	6	1	64	2	67	7	108	3	118	200
Hourly Total	8	4	12	24	9	5	10	24	5	366	14	385	19	356	11	386	819
5:00 PM	2	1	0	3	2	1	2	5	2	93	2	97	4	122	7	133	238
5:15 PM	3	0	1	4	1	1	8	10	2	49	7	58	12	158	2	172	244
5:30 PM	3	0	5	8	2	0	2	4	1	61	4	66	7	133	6	146	224
5:45 PM	4	1	3	8	4	2	3	9	2	62	2	66	3	142	2	147	230

Hourly Total	12	2	9	23	9	4	15	28	7	265	15	287	26	555	17	598	936
6:00 PM	1	0	1	2	1	0	0	1	3	53	0	56	6	78	4	88	147
6:15 PM	4	3	4	11	0	0	4	4	0	52	3	55	6	72	4	82	152
6:30 PM	3	0	3	6	1	0	1	2	2	35	2	39	2	64	3	69	116
6:45 PM	4	0	3	7	1	0	1	2	3	24	1	28	2	61	4	67	104
Hourly Total	12	3	11	26	3	0	6	9	8	164	6	178	16	275	15	306	519
Grand Total	81	23	56	160	73	22	87	182	37	2342	74	2453	104	2327	69	2500	5295
Approach %	50.6	14.4	35.0	-	40.1	12.1	47.8	-	1.5	95.5	3.0	-	4.2	93.1	2.8	-	-
Total %	1.5	0.4	1.1	3.0	1.4	0.4	1.6	3.4	0.7	44.2	1.4	46.3	2.0	43.9	1.3	47.2	-
Lights	80	22	54	156	64	20	79	163	34	2252	64	2350	100	2268	64	2432	5101
% Lights	98.8	95.7	96.4	97.5	87.7	90.9	90.8	89.6	91.9	96.2	86.5	95.8	96.2	97.5	92.8	97.3	96.3
Other Vehicles	1	1	2	4	9	2	8	19	3	90	10	103	4	59	5	68	194
% Other Vehicles	1.2	4.3	3.6	2.5	12.3	9.1	9.2	10.4	8.1	3.8	13.5	4.2	3.8	2.5	7.2	2.7	3.7

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Cliff Ave & 272nd St
Site Code: 1
Start Date: 08/30/2018



Turning Movement Data Plot

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Cliff Ave & 272nd St
Site Code: 1
Start Date: 08/30/2018

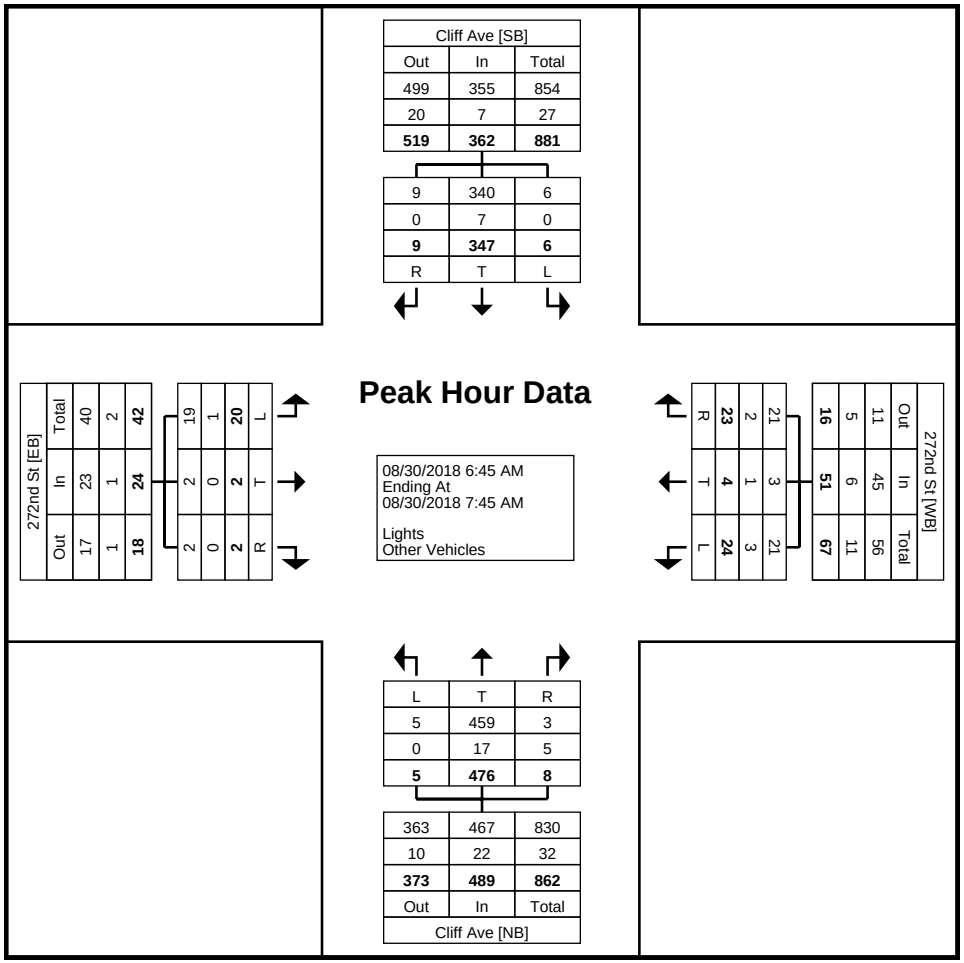
Turning Movement Peak Hour Data (6:45 AM)

Start Time	272nd St Eastbound				272nd St Westbound				Cliff Ave Northbound				Cliff Ave Southbound				
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
6:45 AM	6	0	1	7	2	1	6	9	0	75	5	80	3	150	2	155	251
7:00 AM	3	0	0	3	4	1	7	12	1	101	1	103	0	47	3	50	168
7:15 AM	7	1	0	8	12	1	6	19	2	159	2	163	1	68	2	71	261
7:30 AM	4	1	1	6	6	1	4	11	2	141	0	143	2	82	2	86	246
Total	20	2	2	24	24	4	23	51	5	476	8	489	6	347	9	362	926
Approach %	83.3	8.3	8.3	-	47.1	7.8	45.1	-	1.0	97.3	1.6	-	1.7	95.9	2.5	-	-
Total %	2.2	0.2	0.2	2.6	2.6	0.4	2.5	5.5	0.5	51.4	0.9	52.8	0.6	37.5	1.0	39.1	-
PHF	0.714	0.500	0.500	0.750	0.500	1.000	0.821	0.671	0.625	0.748	0.400	0.750	0.500	0.578	0.750	0.584	0.887
Lights	19	2	2	23	21	3	21	45	5	459	3	467	6	340	9	355	890
% Lights	95.0	100.0	100.0	95.8	87.5	75.0	91.3	88.2	100.0	96.4	37.5	95.5	100.0	98.0	100.0	98.1	96.1
Other Vehicles	1	0	0	1	3	1	2	6	0	17	5	22	0	7	0	7	36
% Other Vehicles	5.0	0.0	0.0	4.2	12.5	25.0	8.7	11.8	0.0	3.6	62.5	4.5	0.0	2.0	0.0	1.9	3.9

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Cliff Ave & 272nd St
Site Code: 1
Start Date: 08/30/2018



Turning Movement Peak Hour Data Plot (6:45 AM)

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Cliff Ave & 272nd St
Site Code: 1
Start Date: 08/30/2018

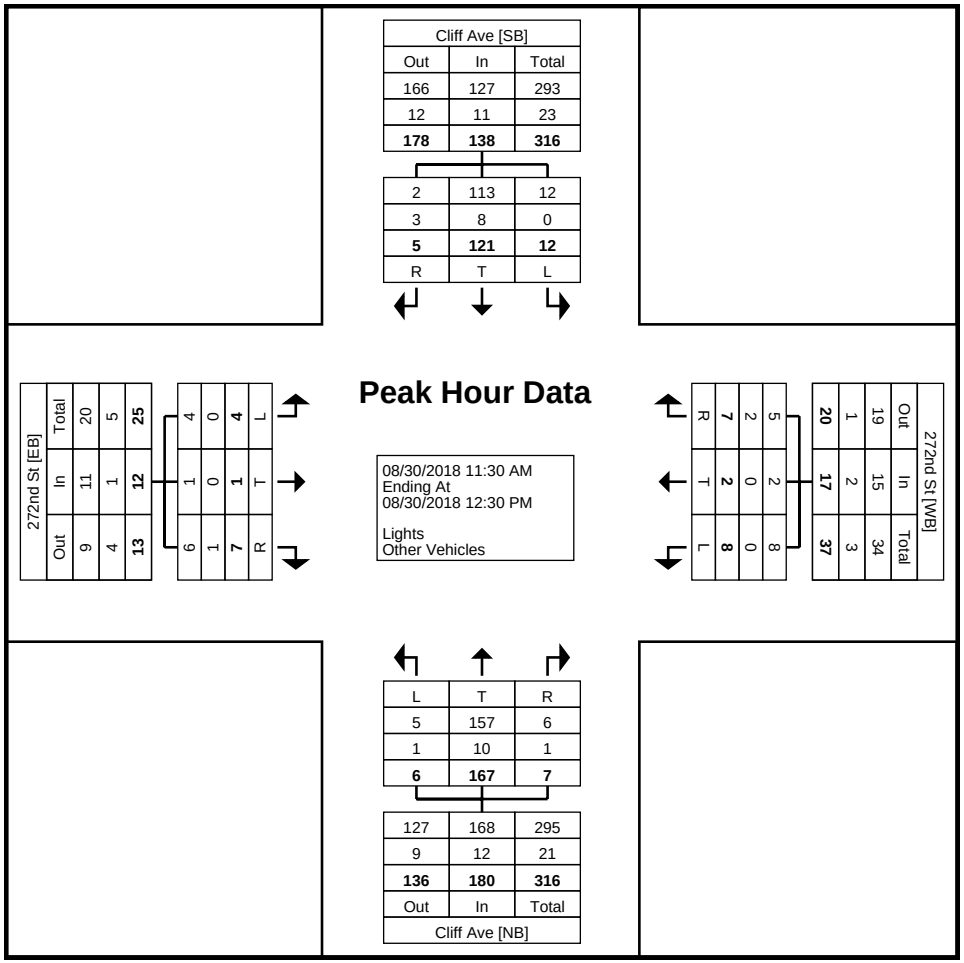
Turning Movement Peak Hour Data (11:30 AM)

Start Time	272nd St Eastbound				272nd St Westbound				Cliff Ave Northbound				Cliff Ave Southbound				
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
11:30 AM	1	1	3	5	2	0	1	3	3	39	2	44	0	30	1	31	83
11:45 AM	2	0	1	3	1	1	1	3	1	37	0	38	3	33	3	39	83
12:00 PM	0	0	0	0	5	1	3	9	2	48	1	51	7	29	0	36	96
12:15 PM	1	0	3	4	0	0	2	2	0	43	4	47	2	29	1	32	85
Total	4	1	7	12	8	2	7	17	6	167	7	180	12	121	5	138	347
Approach %	33.3	8.3	58.3	-	47.1	11.8	41.2	-	3.3	92.8	3.9	-	8.7	87.7	3.6	-	-
Total %	1.2	0.3	2.0	3.5	2.3	0.6	2.0	4.9	1.7	48.1	2.0	51.9	3.5	34.9	1.4	39.8	-
PHF	0.500	0.250	0.583	0.600	0.400	0.500	0.583	0.472	0.500	0.870	0.438	0.882	0.429	0.917	0.417	0.885	0.904
Lights	4	1	6	11	8	2	5	15	5	157	6	168	12	113	2	127	321
% Lights	100.0	100.0	85.7	91.7	100.0	100.0	71.4	88.2	83.3	94.0	85.7	93.3	100.0	93.4	40.0	92.0	92.5
Other Vehicles	0	0	1	1	0	0	2	2	1	10	1	12	0	8	3	11	26
% Other Vehicles	0.0	0.0	14.3	8.3	0.0	0.0	28.6	11.8	16.7	6.0	14.3	6.7	0.0	6.6	60.0	8.0	7.5

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Cliff Ave & 272nd St
Site Code: 1
Start Date: 08/30/2018



Turning Movement Peak Hour Data Plot (11:30 AM)

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Cliff Ave & 272nd St
Site Code: 1
Start Date: 08/30/2018

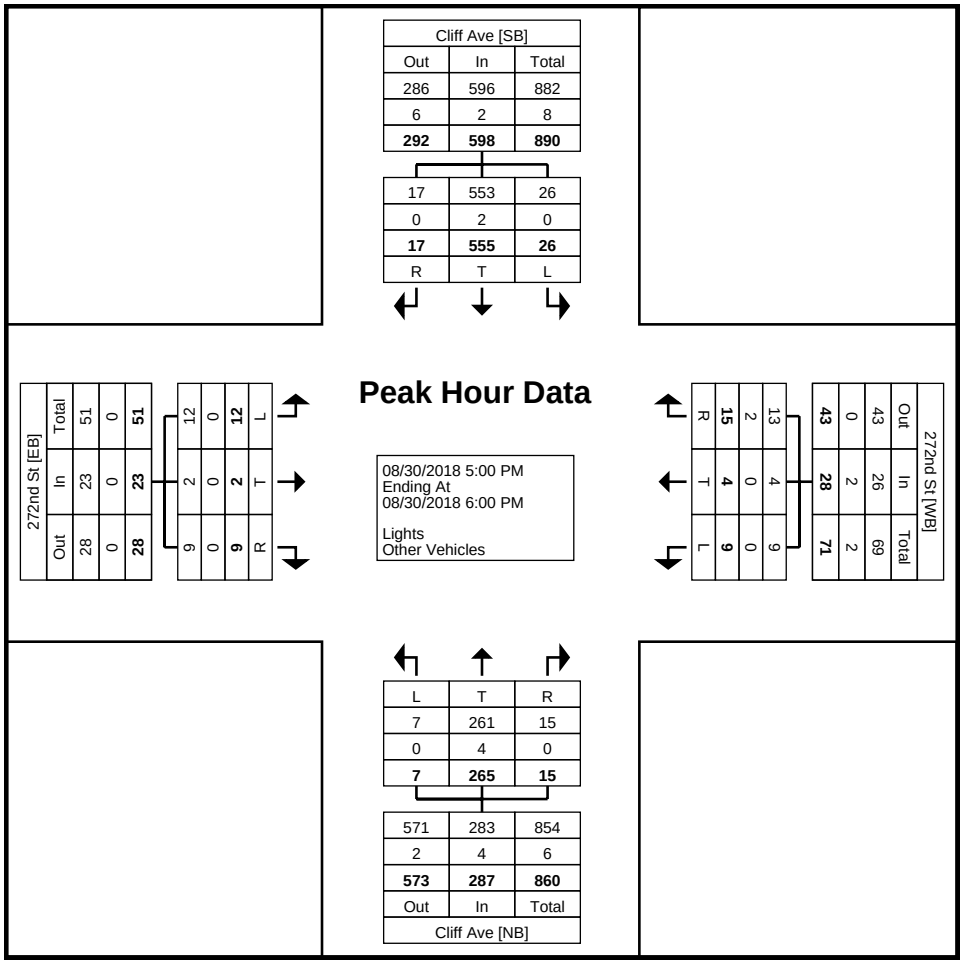
Turning Movement Peak Hour Data (5:00 PM)

Start Time	272nd St Eastbound				272nd St Westbound				Cliff Ave Northbound				Cliff Ave Southbound				
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
5:00 PM	2	1	0	3	2	1	2	5	2	93	2	97	4	122	7	133	238
5:15 PM	3	0	1	4	1	1	8	10	2	49	7	58	12	158	2	172	244
5:30 PM	3	0	5	8	2	0	2	4	1	61	4	66	7	133	6	146	224
5:45 PM	4	1	3	8	4	2	3	9	2	62	2	66	3	142	2	147	230
Total	12	2	9	23	9	4	15	28	7	265	15	287	26	555	17	598	936
Approach %	52.2	8.7	39.1	-	32.1	14.3	53.6	-	2.4	92.3	5.2	-	4.3	92.8	2.8	-	-
Total %	1.3	0.2	1.0	2.5	1.0	0.4	1.6	3.0	0.7	28.3	1.6	30.7	2.8	59.3	1.8	63.9	-
PHF	0.750	0.500	0.450	0.719	0.563	0.500	0.469	0.700	0.875	0.712	0.536	0.740	0.542	0.878	0.607	0.869	0.959
Lights	12	2	9	23	9	4	13	26	7	261	15	283	26	553	17	596	928
% Lights	100.0	100.0	100.0	100.0	100.0	100.0	86.7	92.9	100.0	98.5	100.0	98.6	100.0	99.6	100.0	99.7	99.1
Other Vehicles	0	0	0	0	0	0	2	2	0	4	0	4	0	2	0	2	8
% Other Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	13.3	7.1	0.0	1.5	0.0	1.4	0.0	0.4	0.0	0.3	0.9

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Cliff Ave & 272nd St
Site Code: 1
Start Date: 08/30/2018



Turning Movement Peak Hour Data Plot (5:00 PM)

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Cliff Ave & Industrial Dr / Laura St
Site Code: 2
Start Date: 08/30/2018

Turning Movement Data

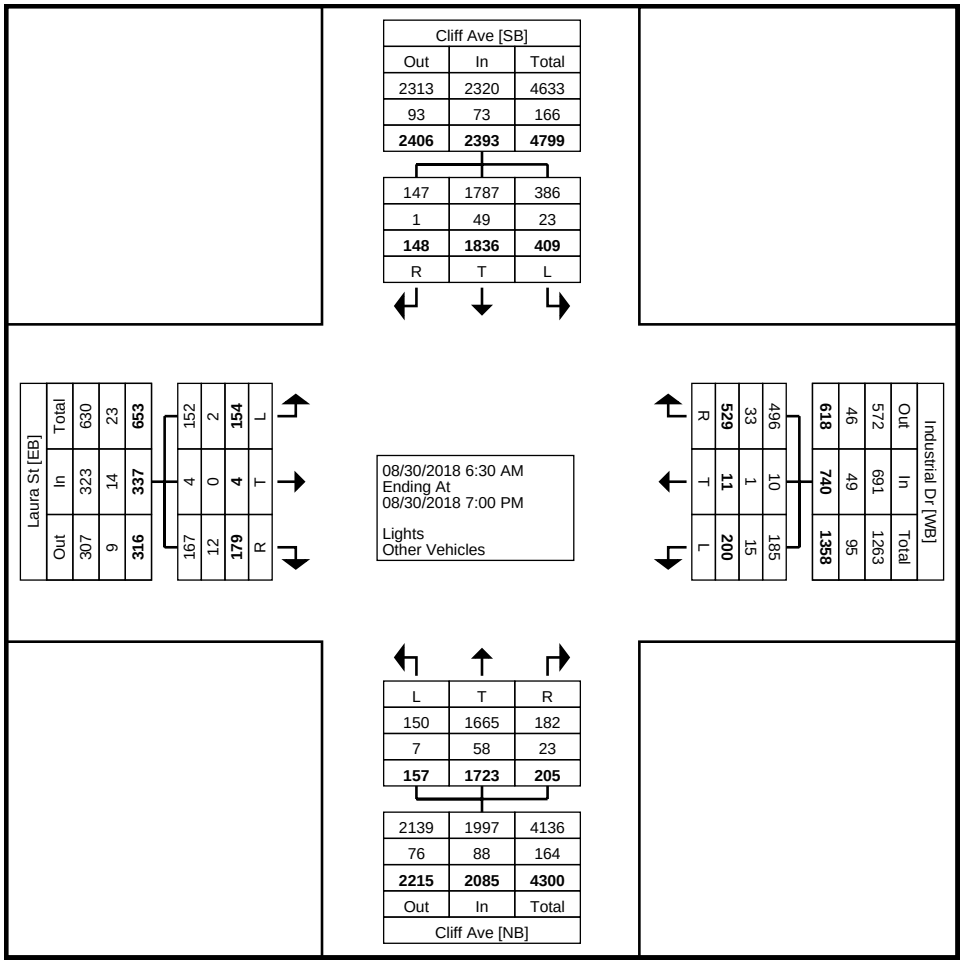
Start Time	Laura St Eastbound				Industrial Dr Westbound				Cliff Ave Northbound				Cliff Ave Southbound				
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
6:30 AM	4	0	2	6	1	0	3	4	1	62	41	104	71	10	0	81	195
6:45 AM	2	0	5	7	1	0	4	5	1	61	44	106	136	18	0	154	272
Hourly Total	6	0	7	13	2	0	7	9	2	123	85	210	207	28	0	235	467
7:00 AM	12	1	5	18	1	0	6	7	4	90	3	97	10	41	3	54	176
7:15 AM	21	0	12	33	3	0	6	9	2	130	4	136	12	64	1	77	255
7:30 AM	14	0	22	36	1	0	4	5	2	123	6	131	17	70	3	90	262
7:45 AM	4	0	11	15	2	0	5	7	7	105	8	120	18	57	2	77	219
Hourly Total	51	1	50	102	7	0	21	28	15	448	21	484	57	232	9	298	912
8:00 AM	9	0	4	13	4	0	6	10	7	72	4	83	16	43	1	60	166
8:15 AM	4	0	1	5	1	0	8	9	1	57	4	62	7	28	1	36	112
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	13	0	5	18	5	0	14	19	8	129	8	145	23	71	2	96	278
11:30 AM	2	0	3	5	11	0	12	23	1	28	7	36	7	28	3	38	102
11:45 AM	2	0	2	4	6	0	8	14	2	26	9	37	10	30	0	40	95
Hourly Total	4	0	5	9	17	0	20	37	3	54	16	73	17	58	3	78	197
12:00 PM	5	0	1	6	11	1	11	23	4	36	8	48	2	30	3	35	112
12:15 PM	1	0	1	2	0	0	6	6	1	37	9	47	8	17	2	27	82
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	6	0	2	8	11	1	17	29	5	73	17	95	10	47	5	62	194
2:00 PM	1	0	1	2	1	0	4	5	4	27	0	31	1	27	3	31	69
2:15 PM	1	0	2	3	7	0	5	12	5	36	2	43	6	33	5	44	102
2:30 PM	0	0	5	5	6	0	23	29	2	41	5	48	3	32	4	39	121
2:45 PM	1	0	1	2	6	2	47	55	2	35	3	40	3	48	4	55	152
Hourly Total	3	0	9	12	20	2	79	101	13	139	10	162	13	140	16	169	444
3:00 PM	4	0	3	7	14	0	39	53	9	65	1	75	5	55	2	62	197
3:15 PM	2	1	7	10	18	2	25	45	6	67	4	77	6	90	2	98	230
3:30 PM	3	0	3	6	12	0	45	57	3	60	6	69	4	51	6	61	193
3:45 PM	5	0	3	8	8	1	14	23	5	38	3	46	4	63	4	71	148
Hourly Total	14	1	16	31	52	3	123	178	23	230	14	267	19	259	14	292	768
4:00 PM	7	0	7	14	17	0	64	81	4	41	6	51	10	68	8	86	232
4:15 PM	6	1	5	12	16	0	53	69	6	52	4	62	5	72	6	83	226
4:30 PM	7	0	7	14	11	1	43	55	7	52	3	62	3	75	8	86	217
4:45 PM	3	0	12	15	11	0	16	27	3	49	5	57	14	88	7	109	208
Hourly Total	23	1	31	55	55	1	176	232	20	194	18	232	32	303	29	364	883
5:00 PM	6	0	6	12	15	1	39	55	9	37	3	49	3	107	10	120	236
5:15 PM	3	0	11	14	2	0	10	12	17	41	5	63	10	118	14	142	231
5:30 PM	5	0	7	12	3	2	12	17	4	44	1	49	9	117	10	136	214
5:45 PM	2	0	13	15	3	0	4	7	12	65	1	78	2	126	5	133	233

Hourly Total	16	0	37	53	23	3	65	91	42	187	10	239	24	468	39	531	914
6:00 PM	5	0	6	11	1	0	2	3	12	54	3	69	3	64	9	76	159
6:15 PM	7	0	4	11	3	0	4	7	5	37	0	42	1	61	4	66	126
6:30 PM	3	0	1	4	2	0	0	2	5	28	1	34	2	53	11	66	106
6:45 PM	3	1	6	10	2	1	1	4	4	27	2	33	1	52	7	60	107
Hourly Total	18	1	17	36	8	1	7	16	26	146	6	178	7	230	31	268	498
Grand Total	154	4	179	337	200	11	529	740	157	1723	205	2085	409	1836	148	2393	5555
Approach %	45.7	1.2	53.1	-	27.0	1.5	71.5	-	7.5	82.6	9.8	-	17.1	76.7	6.2	-	-
Total %	2.8	0.1	3.2	6.1	3.6	0.2	9.5	13.3	2.8	31.0	3.7	37.5	7.4	33.1	2.7	43.1	-
Lights	152	4	167	323	185	10	496	691	150	1665	182	1997	386	1787	147	2320	5331
% Lights	98.7	100.0	93.3	95.8	92.5	90.9	93.8	93.4	95.5	96.6	88.8	95.8	94.4	97.3	99.3	96.9	96.0
Other Vehicles	2	0	12	14	15	1	33	49	7	58	23	88	23	49	1	73	224
% Other Vehicles	1.3	0.0	6.7	4.2	7.5	9.1	6.2	6.6	4.5	3.4	11.2	4.2	5.6	2.7	0.7	3.1	4.0

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Cliff Ave & Industrial Dr / Laura St
Site Code: 2
Start Date: 08/30/2018



Turning Movement Data Plot

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Cliff Ave & Industrial Dr / Laura St
Site Code: 2
Start Date: 08/30/2018

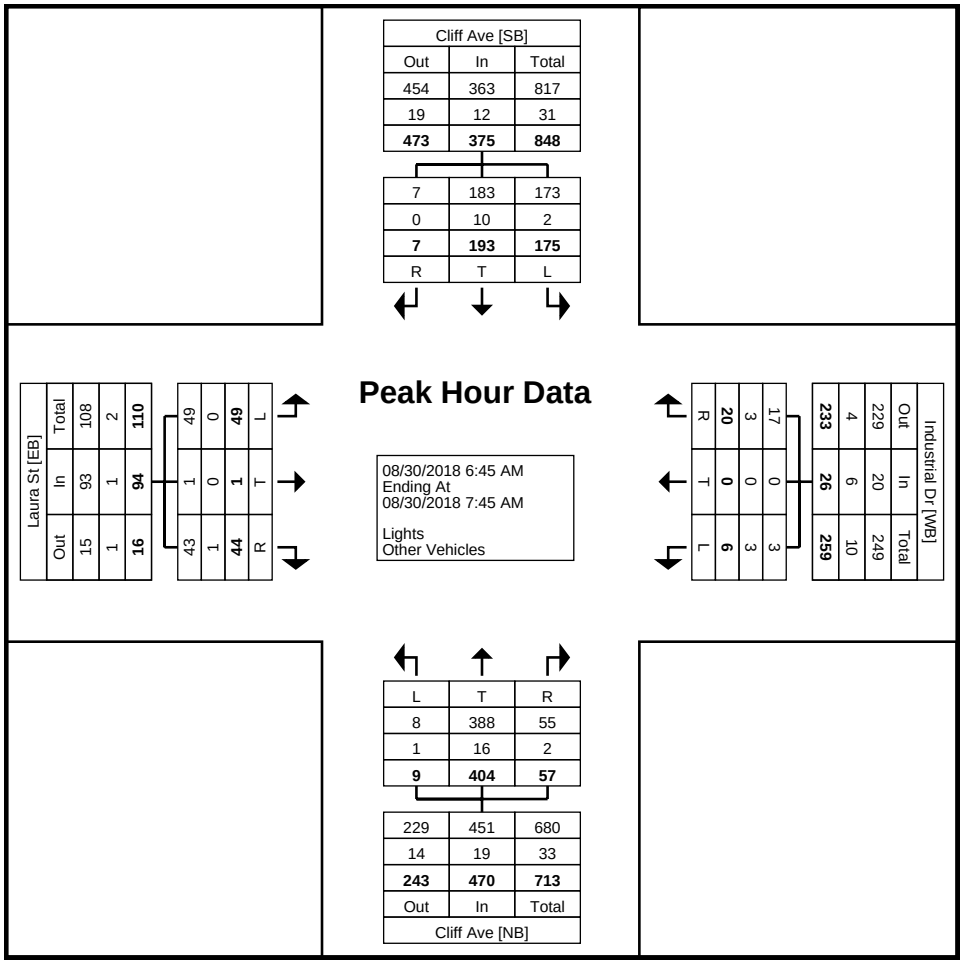
Turning Movement Peak Hour Data (6:45 AM)

Start Time	Laura St Eastbound				Industrial Dr Westbound				Cliff Ave Northbound				Cliff Ave Southbound				
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
6:45 AM	2	0	5	7	1	0	4	5	1	61	44	106	136	18	0	154	272
7:00 AM	12	1	5	18	1	0	6	7	4	90	3	97	10	41	3	54	176
7:15 AM	21	0	12	33	3	0	6	9	2	130	4	136	12	64	1	77	255
7:30 AM	14	0	22	36	1	0	4	5	2	123	6	131	17	70	3	90	262
Total	49	1	44	94	6	0	20	26	9	404	57	470	175	193	7	375	965
Approach %	52.1	1.1	46.8	-	23.1	0.0	76.9	-	1.9	86.0	12.1	-	46.7	51.5	1.9	-	-
Total %	5.1	0.1	4.6	9.7	0.6	0.0	2.1	2.7	0.9	41.9	5.9	48.7	18.1	20.0	0.7	38.9	-
PHF	0.583	0.250	0.500	0.653	0.500	0.000	0.833	0.722	0.563	0.777	0.324	0.864	0.322	0.689	0.583	0.609	0.887
Lights	49	1	43	93	3	0	17	20	8	388	55	451	173	183	7	363	927
% Lights	100.0	100.0	97.7	98.9	50.0	-	85.0	76.9	88.9	96.0	96.5	96.0	98.9	94.8	100.0	96.8	96.1
Other Vehicles	0	0	1	1	3	0	3	6	1	16	2	19	2	10	0	12	38
% Other Vehicles	0.0	0.0	2.3	1.1	50.0	-	15.0	23.1	11.1	4.0	3.5	4.0	1.1	5.2	0.0	3.2	3.9

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Cliff Ave & Industrial Dr / Laura St
Site Code: 2
Start Date: 08/30/2018



Turning Movement Peak Hour Data Plot (6:45 AM)

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Cliff Ave & Industrial Dr / Laura St
Site Code: 2
Start Date: 08/30/2018

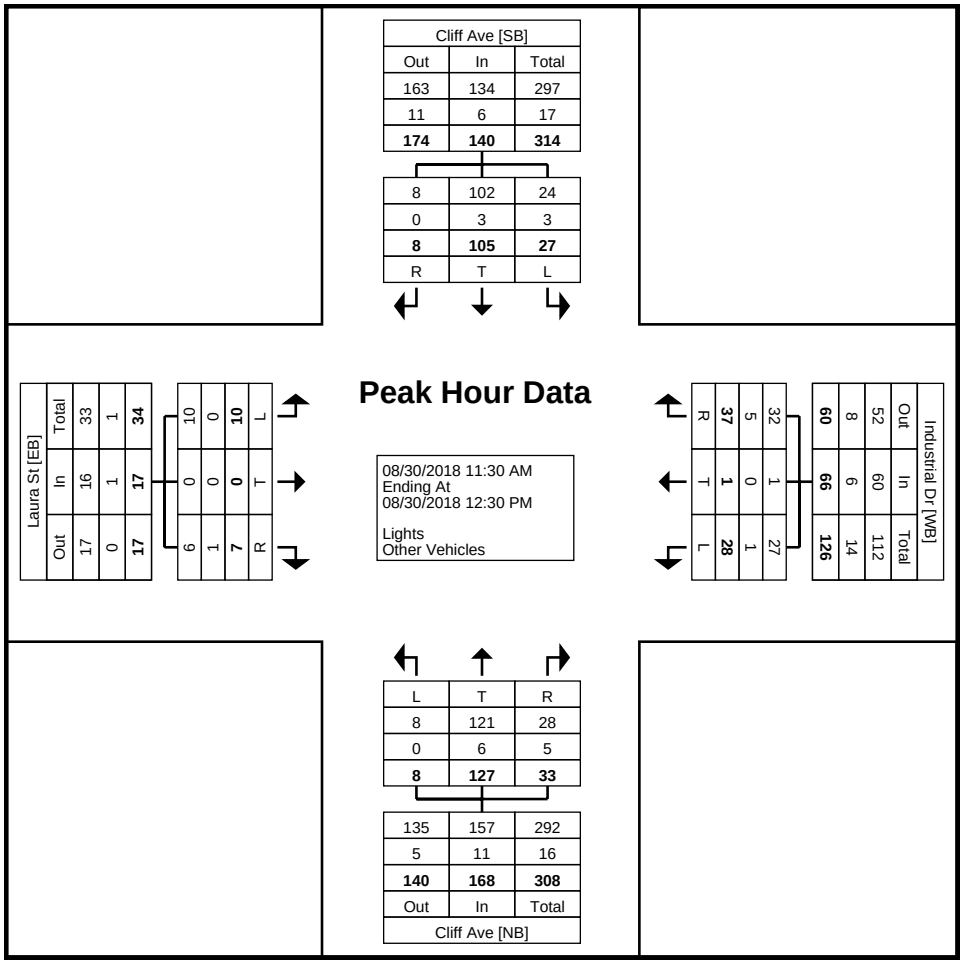
Turning Movement Peak Hour Data (11:30 AM)

Start Time	Laura St Eastbound				Industrial Dr Westbound				Cliff Ave Northbound				Cliff Ave Southbound				
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
11:30 AM	2	0	3	5	11	0	12	23	1	28	7	36	7	28	3	38	102
11:45 AM	2	0	2	4	6	0	8	14	2	26	9	37	10	30	0	40	95
12:00 PM	5	0	1	6	11	1	11	23	4	36	8	48	2	30	3	35	112
12:15 PM	1	0	1	2	0	0	6	6	1	37	9	47	8	17	2	27	82
Total	10	0	7	17	28	1	37	66	8	127	33	168	27	105	8	140	391
Approach %	58.8	0.0	41.2	-	42.4	1.5	56.1	-	4.8	75.6	19.6	-	19.3	75.0	5.7	-	-
Total %	2.6	0.0	1.8	4.3	7.2	0.3	9.5	16.9	2.0	32.5	8.4	43.0	6.9	26.9	2.0	35.8	-
PHF	0.500	0.000	0.583	0.708	0.636	0.250	0.771	0.717	0.500	0.858	0.917	0.875	0.675	0.875	0.667	0.875	0.873
Lights	10	0	6	16	27	1	32	60	8	121	28	157	24	102	8	134	367
% Lights	100.0	-	85.7	94.1	96.4	100.0	86.5	90.9	100.0	95.3	84.8	93.5	88.9	97.1	100.0	95.7	93.9
Other Vehicles	0	0	1	1	1	0	5	6	0	6	5	11	3	3	0	6	24
% Other Vehicles	0.0	-	14.3	5.9	3.6	0.0	13.5	9.1	0.0	4.7	15.2	6.5	11.1	2.9	0.0	4.3	6.1

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Cliff Ave & Industrial Dr / Laura St
Site Code: 2
Start Date: 08/30/2018



Turning Movement Peak Hour Data Plot (11:30 AM)

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Cliff Ave & Industrial Dr / Laura St
Site Code: 2
Start Date: 08/30/2018

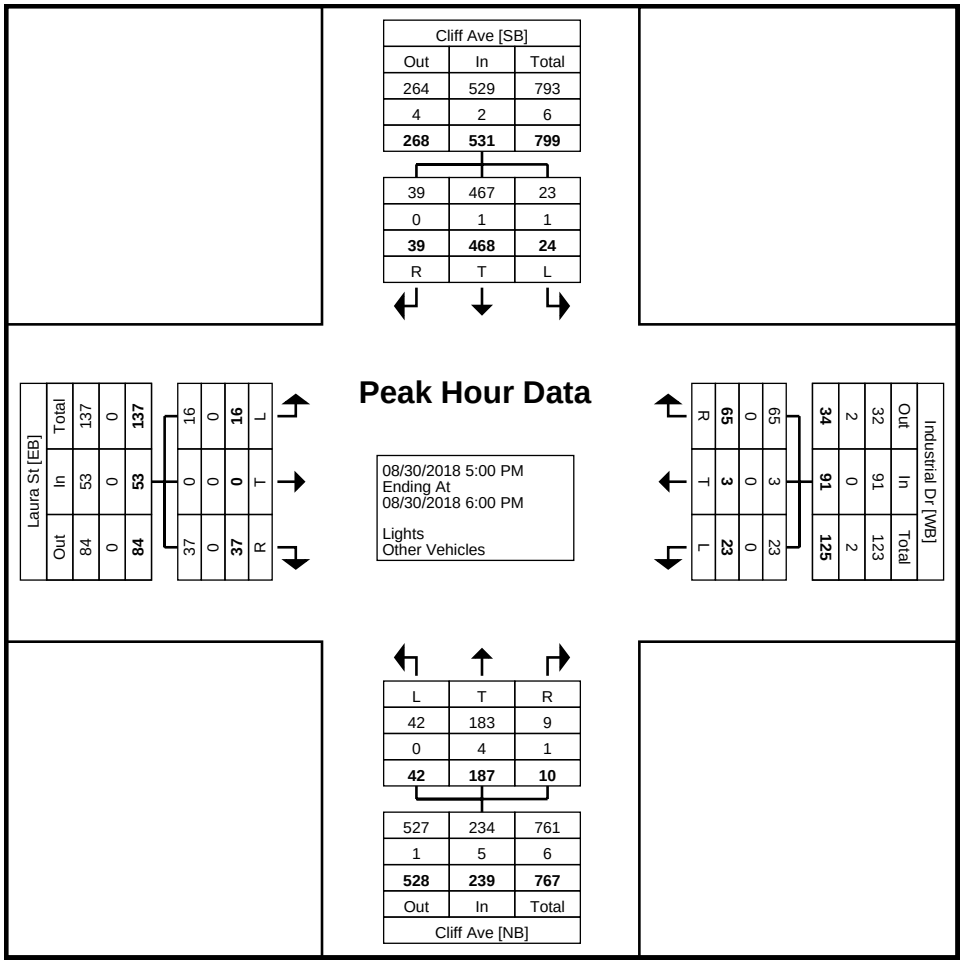
Turning Movement Peak Hour Data (5:00 PM)

Start Time	Laura St Eastbound				Industrial Dr Westbound				Cliff Ave Northbound				Cliff Ave Southbound				
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
5:00 PM	6	0	6	12	15	1	39	55	9	37	3	49	3	107	10	120	236
5:15 PM	3	0	11	14	2	0	10	12	17	41	5	63	10	118	14	142	231
5:30 PM	5	0	7	12	3	2	12	17	4	44	1	49	9	117	10	136	214
5:45 PM	2	0	13	15	3	0	4	7	12	65	1	78	2	126	5	133	233
Total	16	0	37	53	23	3	65	91	42	187	10	239	24	468	39	531	914
Approach %	30.2	0.0	69.8	-	25.3	3.3	71.4	-	17.6	78.2	4.2	-	4.5	88.1	7.3	-	-
Total %	1.8	0.0	4.0	5.8	2.5	0.3	7.1	10.0	4.6	20.5	1.1	26.1	2.6	51.2	4.3	58.1	-
PHF	0.667	0.000	0.712	0.883	0.383	0.375	0.417	0.414	0.618	0.719	0.500	0.766	0.600	0.929	0.696	0.935	0.968
Lights	16	0	37	53	23	3	65	91	42	183	9	234	23	467	39	529	907
% Lights	100.0	-	100.0	100.0	100.0	100.0	100.0	100.0	100.0	97.9	90.0	97.9	95.8	99.8	100.0	99.6	99.2
Other Vehicles	0	0	0	0	0	0	0	0	0	4	1	5	1	1	0	2	7
% Other Vehicles	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	10.0	2.1	4.2	0.2	0.0	0.4	0.8

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Cliff Ave & Industrial Dr / Laura St
Site Code: 2
Start Date: 08/30/2018



Turning Movement Peak Hour Data Plot (5:00 PM)

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Cliff Ave & Willow St
Site Code: 3
Start Date: 08/29/2018

Turning Movement Data

Start Time	Willow St/273rd St Eastbound				Willow St/273rd St Westbound				Cliff Ave/475th Ave Northbound				Cliff Ave/475th Ave Southbound				
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
7:00 PM	8	30	12	50	4	19	13	36	5	8	7	20	21	11	7	39	145
7:15 PM	4	36	4	44	6	21	12	39	1	4	0	5	18	13	8	39	127
7:30 PM	5	46	10	61	4	18	5	27	3	5	4	12	13	11	10	34	134
7:45 PM	2	27	1	30	6	29	17	52	2	6	6	14	22	9	14	45	141
Hourly Total	19	139	27	185	20	87	47	154	11	23	17	51	74	44	39	157	547
8:00 PM	5	30	8	43	6	16	11	33	2	4	7	13	10	12	6	28	117
8:15 PM	9	42	8	59	5	15	6	26	4	8	7	19	21	7	11	39	143
8:30 PM	5	34	9	48	3	20	7	30	5	4	5	14	13	11	11	35	127
8:45 PM	7	24	4	35	9	15	10	34	4	3	6	13	16	10	5	31	113
Hourly Total	26	130	29	185	23	66	34	123	15	19	25	59	60	40	33	133	500
9:00 PM	0	19	5	24	2	6	3	11	3	4	1	8	14	13	8	35	78
9:15 PM	3	22	5	30	5	10	7	22	1	2	1	4	12	4	7	23	79
9:30 PM	3	13	5	21	1	9	3	13	1	2	0	3	5	6	4	15	52
9:45 PM	4	14	0	18	1	4	2	7	2	3	1	6	3	7	3	13	44
Hourly Total	10	68	15	93	9	29	15	53	7	11	3	21	34	30	22	86	253
10:00 PM	1	8	4	13	0	5	2	7	0	1	1	2	10	2	2	14	36
10:15 PM	3	3	1	7	1	4	0	5	0	0	3	3	4	2	1	7	22
10:30 PM	1	6	1	8	1	3	2	6	0	4	0	4	6	1	2	9	27
10:45 PM	1	9	2	12	1	2	1	4	0	0	0	0	3	4	1	8	24
Hourly Total	6	26	8	40	3	14	5	22	0	5	4	9	23	9	6	38	109
11:00 PM	1	5	0	6	0	2	2	4	0	2	0	2	0	1	1	2	14
11:15 PM	0	3	1	4	0	0	1	1	0	0	0	0	1	3	1	5	10
11:30 PM	0	1	3	4	0	3	0	3	2	0	0	2	0	0	1	1	10
11:45 PM	0	3	0	3	1	1	1	3	0	1	0	1	1	1	0	2	9
Hourly Total	1	12	4	17	1	6	4	11	2	3	0	5	2	5	3	10	43
12:00 AM	0	2	1	3	0	2	3	5	0	1	1	2	1	0	2	3	13
12:15 AM	0	5	0	5	0	0	0	0	0	0	0	0	0	2	0	2	7
12:30 AM	0	1	1	2	0	0	1	1	1	0	1	2	1	0	0	1	6
12:45 AM	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	1	2
Hourly Total	0	9	2	11	0	2	4	6	1	1	2	4	3	2	2	7	28
1:00 AM	0	2	0	2	0	0	2	2	0	0	0	0	1	0	0	1	5
1:15 AM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
1:30 AM	1	2	0	3	0	2	0	2	0	0	0	0	0	0	0	0	5
1:45 AM	0	1	0	1	1	0	0	1	0	0	0	0	1	0	0	1	3
Hourly Total	1	7	0	8	1	2	2	5	0	0	0	0	2	0	0	2	15
2:00 AM	0	0	0	0	0	1	1	2	1	0	0	1	0	1	1	2	5
2:15 AM	0	2	0	2	0	0	0	0	0	0	0	0	1	0	0	1	3
2:30 AM	0	1	1	2	1	0	1	2	1	0	0	1	1	0	0	1	6

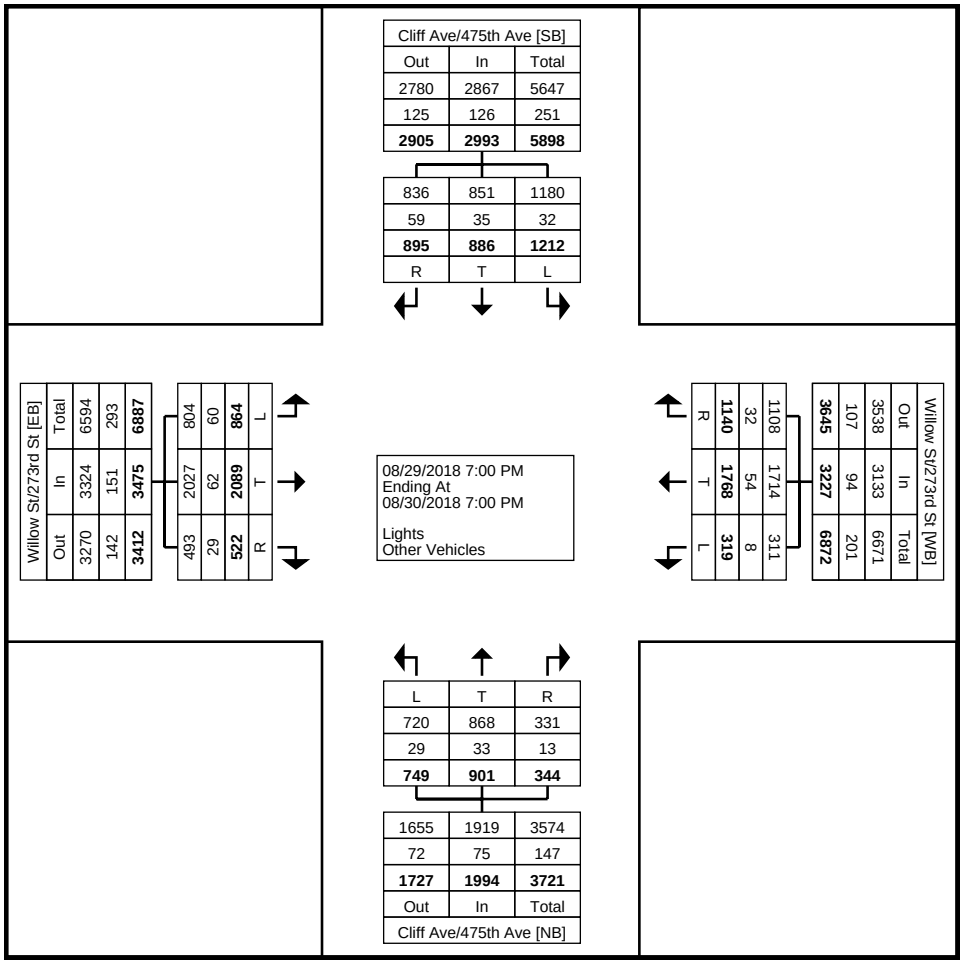
2:45 AM	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	0	2
Hourly Total	0	3	1	4	2	2	2	6	2	0	0	2	2	1	1	4	16
3:00 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3:15 AM	1	1	0	2	0	0	0	0	0	2	0	2	0	0	1	1	5
3:30 AM	1	0	0	1	0	1	5	6	0	1	0	1	0	0	0	0	8
3:45 AM	1	0	0	1	0	4	1	5	0	0	0	0	0	1	0	1	7
Hourly Total	3	2	0	5	0	5	6	11	0	3	0	3	0	1	1	2	21
4:00 AM	0	3	0	3	0	4	1	5	1	0	0	1	0	0	0	0	9
4:15 AM	1	0	0	1	0	3	3	6	0	0	0	0	0	0	0	0	7
4:30 AM	1	0	0	1	0	4	4	8	2	0	0	2	2	2	1	5	16
4:45 AM	1	3	0	4	2	8	2	12	3	1	0	4	1	1	0	2	22
Hourly Total	3	6	0	9	2	19	10	31	6	1	0	7	3	3	1	7	54
5:00 AM	5	2	0	7	1	8	6	15	0	0	1	1	0	1	0	1	24
5:15 AM	1	3	4	8	0	9	9	18	1	1	0	2	0	2	2	4	32
5:30 AM	3	3	0	6	2	23	16	41	8	8	1	17	0	0	2	2	66
5:45 AM	4	8	1	13	1	13	8	22	5	7	1	13	5	4	2	11	59
Hourly Total	13	16	5	34	4	53	39	96	14	16	3	33	5	7	6	18	181
6:00 AM	10	2	2	14	0	18	11	29	6	8	1	15	4	3	6	13	71
6:15 AM	15	8	1	24	4	24	38	66	11	15	3	29	2	4	3	9	128
6:30 AM	43	10	0	53	6	32	42	80	13	18	4	35	2	7	5	14	182
6:45 AM	36	15	2	53	3	45	39	87	13	24	3	40	8	7	12	27	207
Hourly Total	104	35	5	144	13	119	130	262	43	65	11	119	16	21	26	63	588
7:00 AM	24	22	7	53	5	60	47	112	30	32	5	67	0	10	11	21	253
7:15 AM	35	22	18	75	6	59	36	101	47	60	6	113	0	24	32	56	345
7:30 AM	33	31	16	80	1	58	28	87	81	67	9	157	0	20	63	83	407
7:45 AM	29	32	17	78	5	48	26	79	61	54	21	136	0	27	31	58	351
Hourly Total	121	107	58	286	17	225	137	379	219	213	41	473	0	81	137	218	1356
8:00 AM	25	24	3	52	5	25	31	61	13	17	5	35	13	21	11	45	193
8:15 AM	23	20	8	51	0	30	30	60	8	17	6	31	6	15	12	33	175
8:30 AM	11	13	8	32	4	20	19	43	7	15	2	24	6	7	9	22	121
8:45 AM	5	15	2	22	4	22	17	43	5	5	2	12	11	9	7	27	104
Hourly Total	64	72	21	157	13	97	97	207	33	54	15	102	36	52	39	127	593
9:00 AM	10	11	3	24	5	18	11	34	3	5	5	13	9	11	5	25	96
9:15 AM	8	18	4	30	4	11	12	27	11	6	5	22	6	4	8	18	97
9:30 AM	5	11	5	21	1	20	15	36	8	9	2	19	12	8	6	26	102
9:45 AM	6	17	3	26	2	14	9	25	11	11	5	27	17	11	6	34	112
Hourly Total	29	57	15	101	12	63	47	122	33	31	17	81	44	34	25	103	407
10:00 AM	9	10	4	23	5	23	9	37	4	8	3	15	12	10	6	28	103
10:15 AM	8	11	11	30	3	25	17	45	8	9	2	19	4	11	6	21	115
10:30 AM	9	19	4	32	1	22	16	39	10	13	6	29	17	4	10	31	131
10:45 AM	8	18	7	33	5	22	11	38	6	10	4	20	13	8	11	32	123
Hourly Total	34	58	26	118	14	92	53	159	28	40	15	83	46	33	33	112	472
11:00 AM	13	24	4	41	5	23	18	46	2	10	2	14	13	7	9	29	130
11:15 AM	10	18	10	38	4	14	16	34	4	12	1	17	15	9	3	27	116
11:30 AM	8	23	2	33	6	32	10	48	5	11	2	18	19	13	11	43	142
11:45 AM	11	26	3	40	4	16	12	32	4	12	5	21	15	11	11	37	130
Hourly Total	42	91	19	152	19	85	56	160	15	45	10	70	62	40	34	136	518
12:00 PM	18	19	11	48	7	18	11	36	8	16	5	29	14	20	10	44	157
12:15 PM	11	15	6	32	4	19	17	40	8	13	5	26	2	6	7	15	113
12:30 PM	8	26	12	46	4	15	15	34	11	13	6	30	17	6	7	30	140
12:45 PM	12	22	5	39	3	18	22	43	8	11	1	20	7	13	12	32	134
Hourly Total	49	82	34	165	18	70	65	153	35	53	17	105	40	45	36	121	544

1:00 PM	10	29	6	45	0	14	14	28	9	3	3	15	21	10	11	42	130
1:15 PM	11	31	10	52	9	20	9	38	8	2	4	14	18	9	8	35	139
1:30 PM	10	25	6	41	7	26	15	48	11	6	6	23	8	6	6	20	132
1:45 PM	7	28	6	41	3	22	13	38	10	8	1	19	12	13	11	36	134
Hourly Total	38	113	28	179	19	82	51	152	38	19	14	71	59	38	36	133	535
2:00 PM	10	19	2	31	2	22	11	35	10	7	3	20	17	11	6	34	120
2:15 PM	11	26	5	42	12	15	13	40	8	17	12	37	16	9	9	34	153
2:30 PM	13	34	12	59	5	14	20	39	8	11	5	24	14	12	15	41	163
2:45 PM	9	27	8	44	6	23	13	42	7	16	1	24	16	14	16	46	156
Hourly Total	43	106	27	176	25	74	57	156	33	51	21	105	63	46	46	155	592
3:00 PM	29	64	20	113	4	17	14	35	17	25	16	58	29	21	13	63	269
3:15 PM	12	46	10	68	7	40	24	71	16	21	7	44	40	33	33	106	289
3:30 PM	20	35	10	65	5	44	22	71	13	14	8	35	32	13	20	65	236
3:45 PM	20	47	12	79	3	23	10	36	12	11	3	26	30	18	24	72	213
Hourly Total	81	192	52	325	19	124	70	213	58	71	34	163	131	85	90	306	1007
4:00 PM	17	45	14	76	6	23	11	40	15	14	5	34	33	15	29	77	227
4:15 PM	19	57	9	85	6	31	21	58	9	17	5	31	51	18	22	91	265
4:30 PM	12	60	15	87	3	34	17	54	8	14	6	28	35	35	20	90	259
4:45 PM	14	78	16	108	9	40	22	71	14	17	9	40	56	24	25	105	324
Hourly Total	62	240	54	356	24	128	71	223	46	62	25	133	175	92	96	363	1075
5:00 PM	16	64	11	91	9	47	16	72	20	19	10	49	64	19	36	119	331
5:15 PM	21	79	15	115	6	50	21	77	22	20	10	52	57	27	40	124	368
5:30 PM	8	94	10	112	11	43	15	69	20	20	9	49	57	27	25	109	339
5:45 PM	29	69	15	113	11	39	20	70	14	19	16	49	61	33	25	119	351
Hourly Total	74	306	51	431	37	179	72	288	76	78	45	199	239	106	126	471	1389
6:00 PM	20	72	8	100	9	34	24	67	10	14	7	31	26	22	14	62	260
6:15 PM	12	51	18	81	6	39	20	65	13	8	10	31	23	20	13	56	233
6:30 PM	5	50	6	61	6	32	8	46	6	8	5	19	22	14	13	49	175
6:45 PM	4	39	9	52	3	40	14	57	5	7	3	15	22	15	17	54	178
Hourly Total	41	212	41	294	24	145	66	235	34	37	25	96	93	71	57	221	846
Grand Total	864	2089	522	3475	319	1768	1140	3227	749	901	344	1994	1212	886	895	2993	11689
Approach %	24.9	60.1	15.0	-	9.9	54.8	35.3	-	37.6	45.2	17.3	-	40.5	29.6	29.9	-	-
Total %	7.4	17.9	4.5	29.7	2.7	15.1	9.8	27.6	6.4	7.7	2.9	17.1	10.4	7.6	7.7	25.6	-
Lights	804	2027	493	3324	311	1714	1108	3133	720	868	331	1919	1180	851	836	2867	11243
% Lights	93.1	97.0	94.4	95.7	97.5	96.9	97.2	97.1	96.1	96.3	96.2	96.2	97.4	96.0	93.4	95.8	96.2
Other Vehicles	60	62	29	151	8	54	32	94	29	33	13	75	32	35	59	126	446
% Other Vehicles	6.9	3.0	5.6	4.3	2.5	3.1	2.8	2.9	3.9	3.7	3.8	3.8	2.6	4.0	6.6	4.2	3.8

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Cliff Ave & Willow St
Site Code: 3
Start Date: 08/29/2018



Turning Movement Data Plot

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Cliff Ave & Willow St
Site Code: 3
Start Date: 08/29/2018

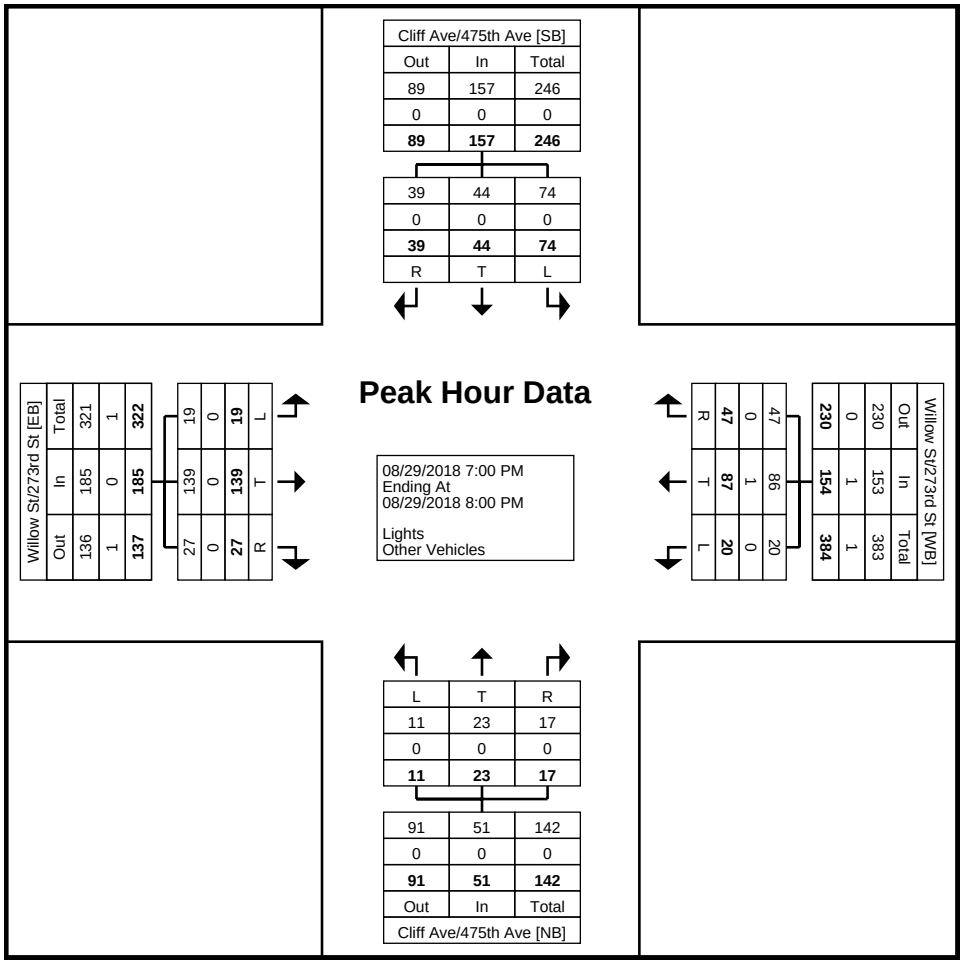
Turning Movement Peak Hour Data (7:00 PM)

Start Time	Willow St/273rd St Eastbound				Willow St/273rd St Westbound				Cliff Ave/475th Ave Northbound				Cliff Ave/475th Ave Southbound				
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
7:00 PM	8	30	12	50	4	19	13	36	5	8	7	20	21	11	7	39	145
7:15 PM	4	36	4	44	6	21	12	39	1	4	0	5	18	13	8	39	127
7:30 PM	5	46	10	61	4	18	5	27	3	5	4	12	13	11	10	34	134
7:45 PM	2	27	1	30	6	29	17	52	2	6	6	14	22	9	14	45	141
Total	19	139	27	185	20	87	47	154	11	23	17	51	74	44	39	157	547
Approach %	10.3	75.1	14.6	-	13.0	56.5	30.5	-	21.6	45.1	33.3	-	47.1	28.0	24.8	-	-
Total %	3.5	25.4	4.9	33.8	3.7	15.9	8.6	28.2	2.0	4.2	3.1	9.3	13.5	8.0	7.1	28.7	-
PHF	0.594	0.755	0.563	0.758	0.833	0.750	0.691	0.740	0.550	0.719	0.607	0.638	0.841	0.846	0.696	0.872	0.943
Lights	19	139	27	185	20	86	47	153	11	23	17	51	74	44	39	157	546
% Lights	100.0	100.0	100.0	100.0	100.0	98.9	100.0	99.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8
Other Vehicles	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
% Other Vehicles	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Cliff Ave & Willow St
Site Code: 3
Start Date: 08/29/2018



Turning Movement Peak Hour Data Plot (7:00 PM)

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Cliff Ave & Willow St
Site Code: 3
Start Date: 08/29/2018

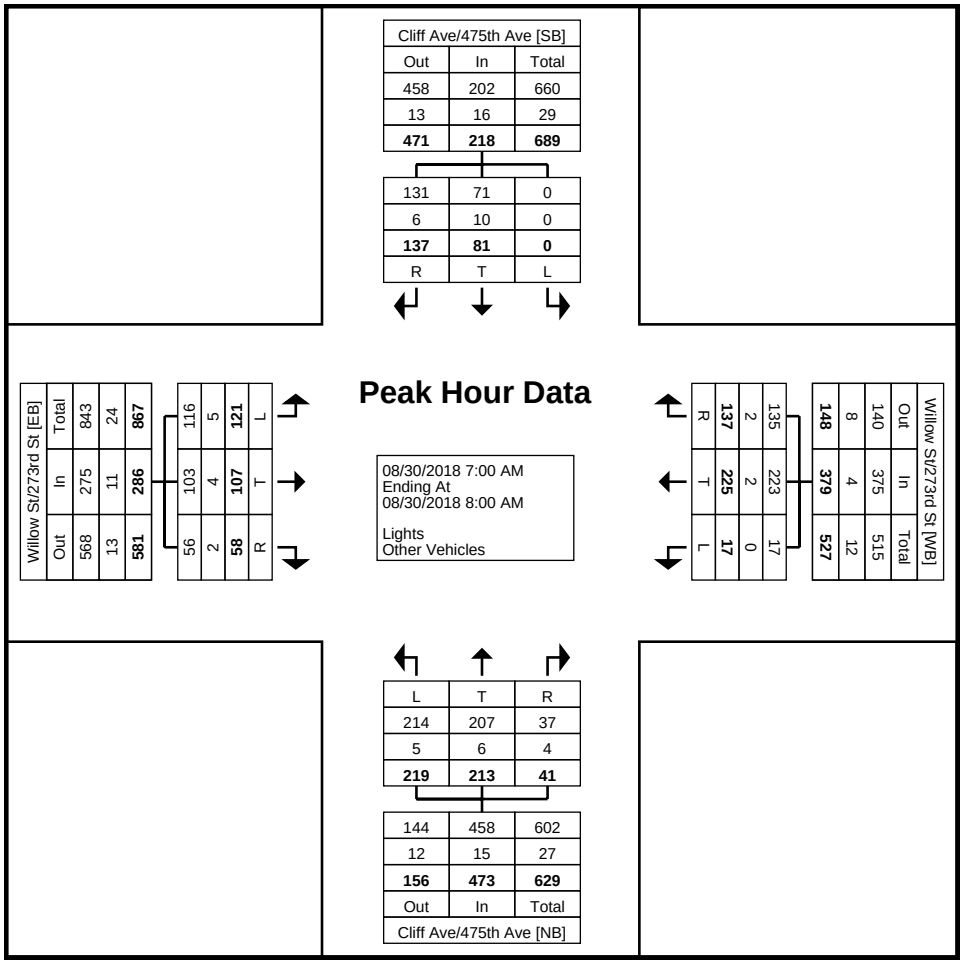
Turning Movement Peak Hour Data (7:00 AM)

Start Time	Willow St/273rd St Eastbound				Willow St/273rd St Westbound				Cliff Ave/475th Ave Northbound				Cliff Ave/475th Ave Southbound				
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
7:00 AM	24	22	7	53	5	60	47	112	30	32	5	67	0	10	11	21	253
7:15 AM	35	22	18	75	6	59	36	101	47	60	6	113	0	24	32	56	345
7:30 AM	33	31	16	80	1	58	28	87	81	67	9	157	0	20	63	83	407
7:45 AM	29	32	17	78	5	48	26	79	61	54	21	136	0	27	31	58	351
Total	121	107	58	286	17	225	137	379	219	213	41	473	0	81	137	218	1356
Approach %	42.3	37.4	20.3	-	4.5	59.4	36.1	-	46.3	45.0	8.7	-	0.0	37.2	62.8	-	-
Total %	8.9	7.9	4.3	21.1	1.3	16.6	10.1	27.9	16.2	15.7	3.0	34.9	0.0	6.0	10.1	16.1	-
PHF	0.864	0.836	0.806	0.894	0.708	0.938	0.729	0.846	0.676	0.795	0.488	0.753	0.000	0.750	0.544	0.657	0.833
Lights	116	103	56	275	17	223	135	375	214	207	37	458	0	71	131	202	1310
% Lights	95.9	96.3	96.6	96.2	100.0	99.1	98.5	98.9	97.7	97.2	90.2	96.8	-	87.7	95.6	92.7	96.6
Other Vehicles	5	4	2	11	0	2	2	4	5	6	4	15	0	10	6	16	46
% Other Vehicles	4.1	3.7	3.4	3.8	0.0	0.9	1.5	1.1	2.3	2.8	9.8	3.2	-	12.3	4.4	7.3	3.4

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Cliff Ave & Willow St
Site Code: 3
Start Date: 08/29/2018



Turning Movement Peak Hour Data Plot (7:00 AM)

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Cliff Ave & Willow St
Site Code: 3
Start Date: 08/29/2018

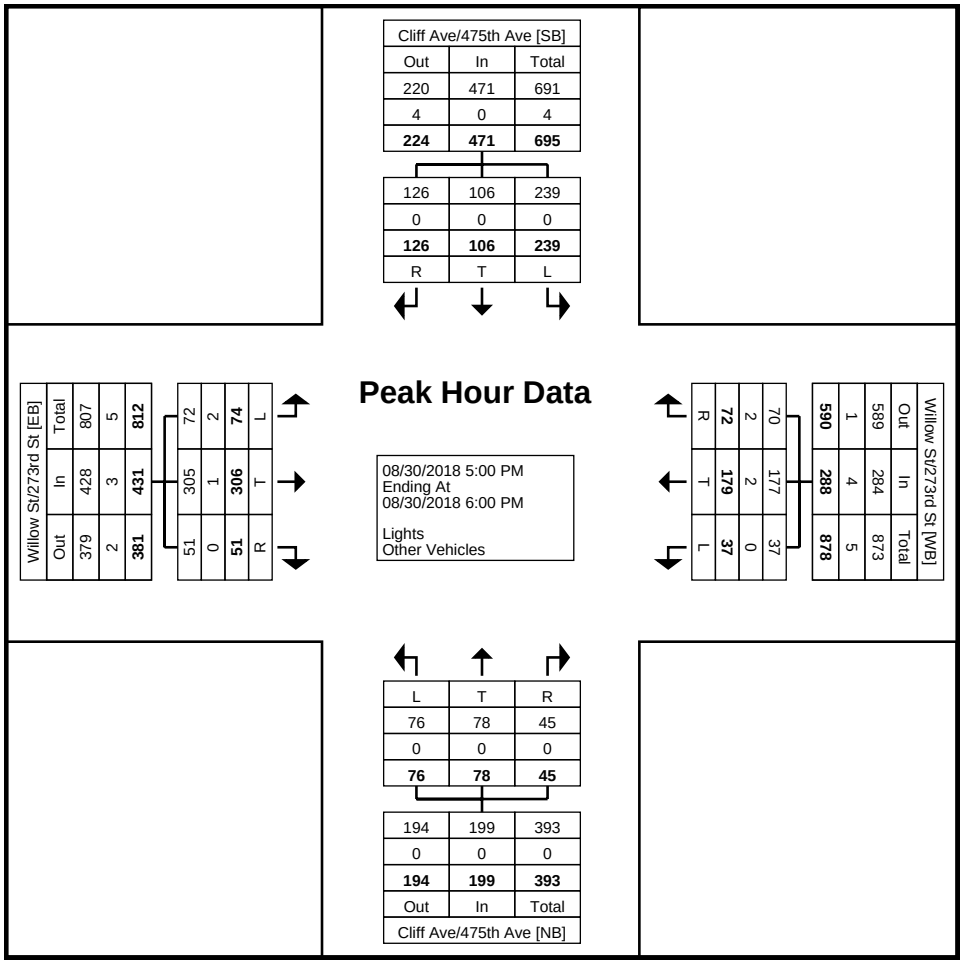
Turning Movement Peak Hour Data (5:00 PM)

Start Time	Willow St/273rd St Eastbound				Willow St/273rd St Westbound				Cliff Ave/475th Ave Northbound				Cliff Ave/475th Ave Southbound				
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
5:00 PM	16	64	11	91	9	47	16	72	20	19	10	49	64	19	36	119	331
5:15 PM	21	79	15	115	6	50	21	77	22	20	10	52	57	27	40	124	368
5:30 PM	8	94	10	112	11	43	15	69	20	20	9	49	57	27	25	109	339
5:45 PM	29	69	15	113	11	39	20	70	14	19	16	49	61	33	25	119	351
Total	74	306	51	431	37	179	72	288	76	78	45	199	239	106	126	471	1389
Approach %	17.2	71.0	11.8	-	12.8	62.2	25.0	-	38.2	39.2	22.6	-	50.7	22.5	26.8	-	-
Total %	5.3	22.0	3.7	31.0	2.7	12.9	5.2	20.7	5.5	5.6	3.2	14.3	17.2	7.6	9.1	33.9	-
PHF	0.638	0.814	0.850	0.937	0.841	0.895	0.857	0.935	0.864	0.975	0.703	0.957	0.934	0.803	0.788	0.950	0.944
Lights	72	305	51	428	37	177	70	284	76	78	45	199	239	106	126	471	1382
% Lights	97.3	99.7	100.0	99.3	100.0	98.9	97.2	98.6	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.5
Other Vehicles	2	1	0	3	0	2	2	4	0	0	0	0	0	0	0	0	7
% Other Vehicles	2.7	0.3	0.0	0.7	0.0	1.1	2.8	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Cliff Ave & Willow St
Site Code: 3
Start Date: 08/29/2018



Turning Movement Peak Hour Data Plot (5:00 PM)

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Willow St & Tiger Way
Site Code: 4
Start Date: 08/30/2018

Turning Movement Data

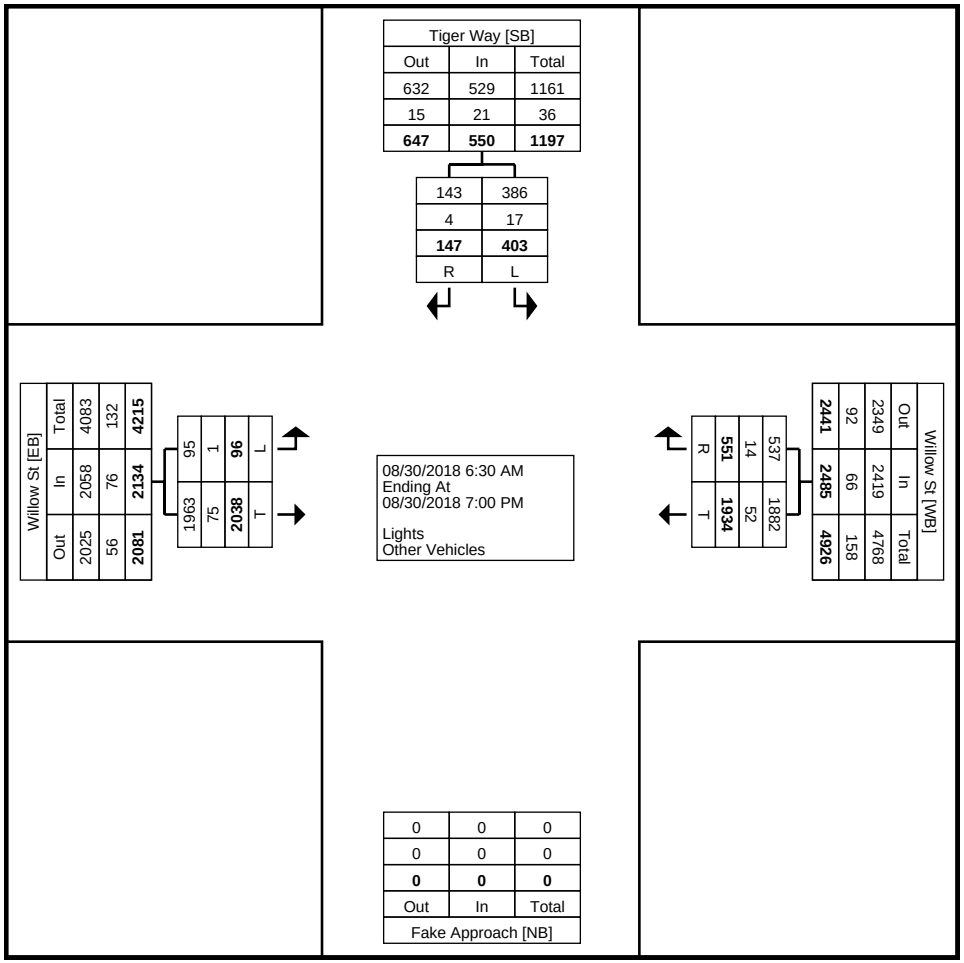
Start Time	Willow St Eastbound			Willow St Westbound			Tiger Way Southbound			Int. Total
	Left	Thru	App. Total	Thru	Right	App. Total	Left	Right	App. Total	
6:30 AM	1	39	40	78	5	83	0	3	3	126
6:45 AM	2	42	44	79	14	93	2	0	2	139
Hourly Total	3	81	84	157	19	176	2	3	5	265
7:00 AM	3	40	43	123	23	146	4	3	7	196
7:15 AM	7	46	53	117	70	187	12	6	18	258
7:30 AM	14	49	63	139	121	260	13	17	30	353
7:45 AM	18	43	61	83	88	171	25	8	33	265
Hourly Total	42	178	220	462	302	764	54	34	88	1072
8:00 AM	1	37	38	66	6	72	4	2	6	116
8:15 AM	0	41	41	52	8	60	3	0	3	104
*** BREAK ***	-	-	-	-	-	-	-	-	-	-
Hourly Total	1	78	79	118	14	132	7	2	9	220
11:30 AM	2	41	43	33	14	47	6	0	6	96
11:45 AM	0	15	15	26	9	35	19	2	21	71
Hourly Total	2	56	58	59	23	82	25	2	27	167
12:00 PM	3	53	56	32	8	40	9	0	9	105
12:15 PM	0	38	38	31	10	41	2	0	2	81
*** BREAK ***	-	-	-	-	-	-	-	-	-	-
Hourly Total	3	91	94	63	18	81	11	0	11	186
2:00 PM	0	35	35	42	9	51	9	3	12	98
2:15 PM	2	29	31	29	4	33	7	3	10	74
2:30 PM	7	44	51	24	10	34	18	4	22	107
2:45 PM	6	44	50	27	25	52	3	6	9	111
Hourly Total	15	152	167	122	48	170	37	16	53	390
3:00 PM	7	64	71	42	5	47	103	59	162	280
3:15 PM	2	43	45	67	8	75	30	3	33	153
3:30 PM	2	43	45	67	7	74	17	2	19	138
3:45 PM	0	68	68	52	6	58	11	1	12	138
Hourly Total	11	218	229	228	26	254	161	65	226	709
4:00 PM	2	74	76	60	4	64	5	4	9	149
4:15 PM	0	78	78	55	2	57	10	1	11	146
4:30 PM	3	110	113	53	2	55	7	1	8	176
4:45 PM	1	104	105	64	6	70	8	1	9	184
Hourly Total	6	366	372	232	14	246	30	7	37	655
5:00 PM	3	104	107	69	6	75	13	4	17	199
5:15 PM	3	135	138	66	14	80	17	8	25	243
5:30 PM	4	134	138	60	21	81	19	1	20	239
5:45 PM	1	133	134	81	12	93	8	2	10	237

Hourly Total	11	506	517	276	53	329	57	15	72	918
6:00 PM	1	92	93	55	9	64	9	1	10	167
6:15 PM	1	80	81	67	11	78	5	1	6	165
6:30 PM	0	67	67	48	5	53	5	0	5	125
6:45 PM	0	73	73	47	9	56	0	1	1	130
Hourly Total	2	312	314	217	34	251	19	3	22	587
Grand Total	96	2038	2134	1934	551	2485	403	147	550	5169
Approach %	4.5	95.5	-	77.8	22.2	-	73.3	26.7	-	-
Total %	1.9	39.4	41.3	37.4	10.7	48.1	7.8	2.8	10.6	-
Lights	95	1963	2058	1882	537	2419	386	143	529	5006
% Lights	99.0	96.3	96.4	97.3	97.5	97.3	95.8	97.3	96.2	96.8
Other Vehicles	1	75	76	52	14	66	17	4	21	163
% Other Vehicles	1.0	3.7	3.6	2.7	2.5	2.7	4.2	2.7	3.8	3.2

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Willow St & Tiger Way
Site Code: 4
Start Date: 08/30/2018



Turning Movement Data Plot

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Willow St & Tiger Way
Site Code: 4
Start Date: 08/30/2018

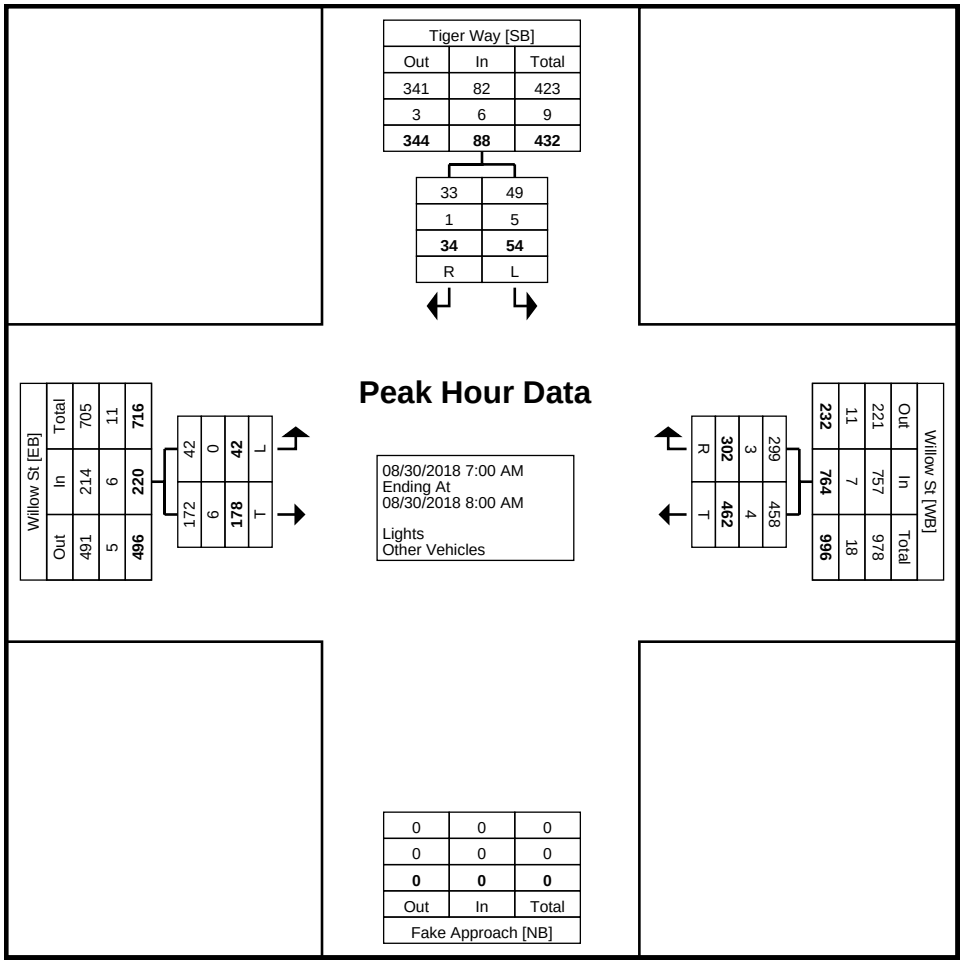
Turning Movement Peak Hour Data (7:00 AM)

Start Time	Willow St Eastbound			Willow St Westbound			Tiger Way Southbound			
	Left	Thru	App. Total	Thru	Right	App. Total	Left	Right	App. Total	Int. Total
7:00 AM	3	40	43	123	23	146	4	3	7	196
7:15 AM	7	46	53	117	70	187	12	6	18	258
7:30 AM	14	49	63	139	121	260	13	17	30	353
7:45 AM	18	43	61	83	88	171	25	8	33	265
Total	42	178	220	462	302	764	54	34	88	1072
Approach %	19.1	80.9	-	60.5	39.5	-	61.4	38.6	-	-
Total %	3.9	16.6	20.5	43.1	28.2	71.3	5.0	3.2	8.2	-
PHF	0.583	0.908	0.873	0.831	0.624	0.735	0.540	0.500	0.667	0.759
Lights	42	172	214	458	299	757	49	33	82	1053
% Lights	100.0	96.6	97.3	99.1	99.0	99.1	90.7	97.1	93.2	98.2
Other Vehicles	0	6	6	4	3	7	5	1	6	19
% Other Vehicles	0.0	3.4	2.7	0.9	1.0	0.9	9.3	2.9	6.8	1.8

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Willow St & Tiger Way
Site Code: 4
Start Date: 08/30/2018



Turning Movement Peak Hour Data Plot (7:00 AM)

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Willow St & Tiger Way
Site Code: 4
Start Date: 08/30/2018

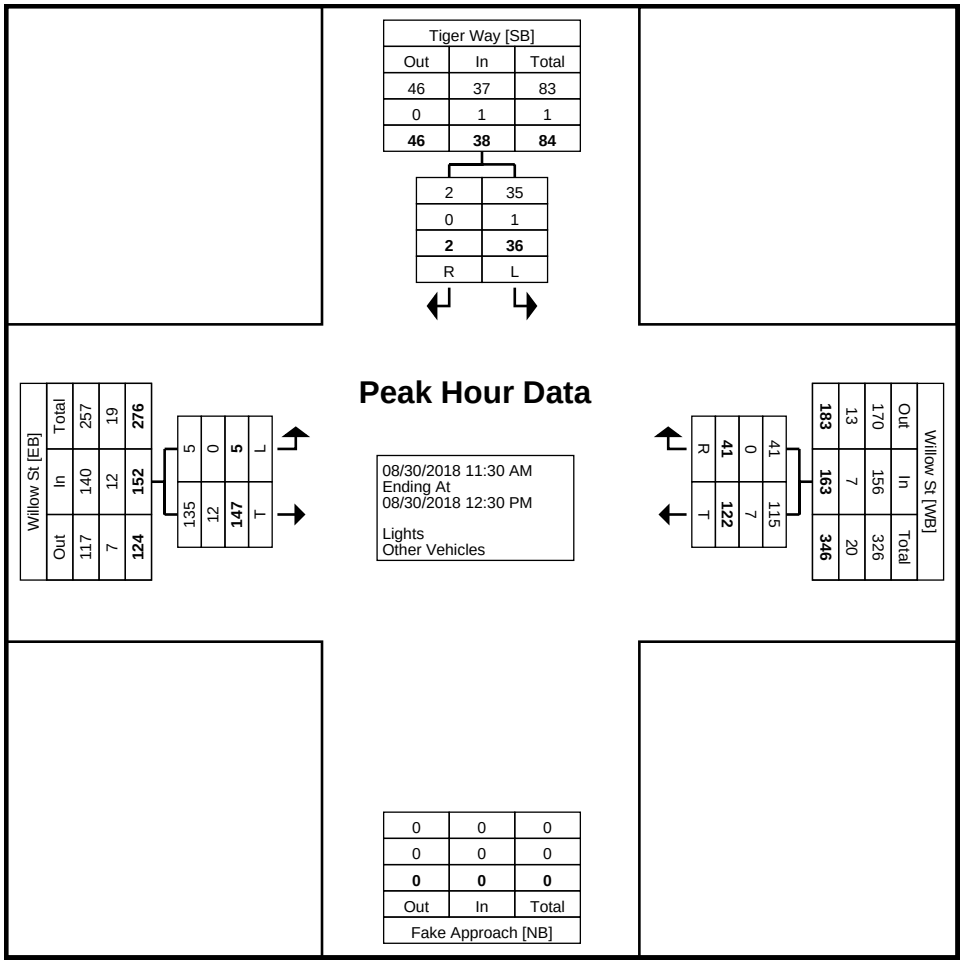
Turning Movement Peak Hour Data (11:30 AM)

Start Time	Willow St Eastbound			Willow St Westbound			Tiger Way Southbound			
	Left	Thru	App. Total	Thru	Right	App. Total	Left	Right	App. Total	Int. Total
11:30 AM	2	41	43	33	14	47	6	0	6	96
11:45 AM	0	15	15	26	9	35	19	2	21	71
12:00 PM	3	53	56	32	8	40	9	0	9	105
12:15 PM	0	38	38	31	10	41	2	0	2	81
Total	5	147	152	122	41	163	36	2	38	353
Approach %	3.3	96.7	-	74.8	25.2	-	94.7	5.3	-	-
Total %	1.4	41.6	43.1	34.6	11.6	46.2	10.2	0.6	10.8	-
PHF	0.417	0.693	0.679	0.924	0.732	0.867	0.474	0.250	0.452	0.840
Lights	5	135	140	115	41	156	35	2	37	333
% Lights	100.0	91.8	92.1	94.3	100.0	95.7	97.2	100.0	97.4	94.3
Other Vehicles	0	12	12	7	0	7	1	0	1	20
% Other Vehicles	0.0	8.2	7.9	5.7	0.0	4.3	2.8	0.0	2.6	5.7

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Willow St & Tiger Way
Site Code: 4
Start Date: 08/30/2018



Turning Movement Peak Hour Data Plot (11:30 AM)

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Willow St & Tiger Way
Site Code: 4
Start Date: 08/30/2018

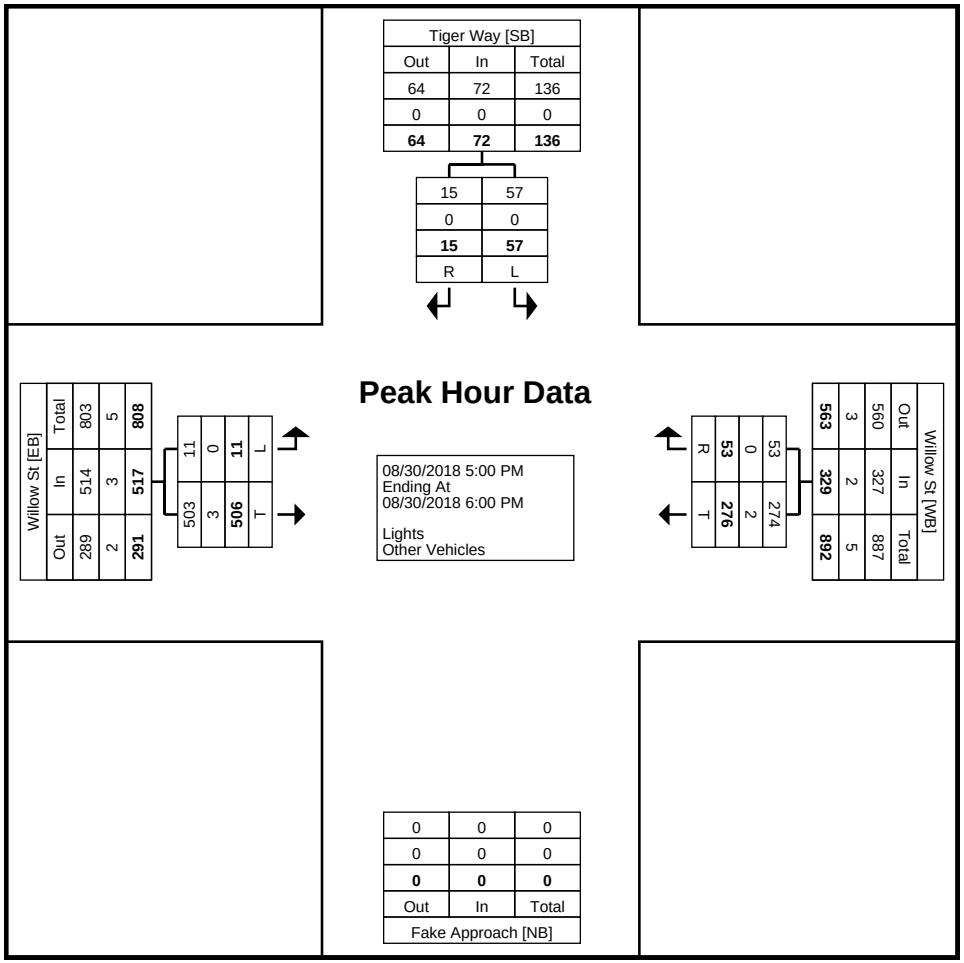
Turning Movement Peak Hour Data (5:00 PM)

Start Time	Willow St Eastbound			Willow St Westbound			Tiger Way Southbound			
	Left	Thru	App. Total	Thru	Right	App. Total	Left	Right	App. Total	Int. Total
5:00 PM	3	104	107	69	6	75	13	4	17	199
5:15 PM	3	135	138	66	14	80	17	8	25	243
5:30 PM	4	134	138	60	21	81	19	1	20	239
5:45 PM	1	133	134	81	12	93	8	2	10	237
Total	11	506	517	276	53	329	57	15	72	918
Approach %	2.1	97.9	-	83.9	16.1	-	79.2	20.8	-	-
Total %	1.2	55.1	56.3	30.1	5.8	35.8	6.2	1.6	7.8	-
PHF	0.688	0.937	0.937	0.852	0.631	0.884	0.750	0.469	0.720	0.944
Lights	11	503	514	274	53	327	57	15	72	913
% Lights	100.0	99.4	99.4	99.3	100.0	99.4	100.0	100.0	100.0	99.5
Other Vehicles	0	3	3	2	0	2	0	0	0	5
% Other Vehicles	0.0	0.6	0.6	0.7	0.0	0.6	0.0	0.0	0.0	0.5

MNRG - Omaha
1753 S. 107th St

Omaha, Nebraska, United States 68124
402-708-9175

Count Name: Willow St & Tiger Way
Site Code: 4
Start Date: 08/30/2018



Turning Movement Peak Hour Data Plot (5:00 PM)

MUTCD Volume-based Warrant Evaluation
272nd St & Cliff Ave
2018 - Existing Conditions

FELSBURG HOLT & ULLEVIG

Major Street:	Cliff Avenue	Minor Street:	272nd Street
Approach Speed:	35 MPH	Right Turn Volume Included:	100% EB, 100% WB
Lanes Moving Traffic:	1	Lanes Moving Traffic:	1
Option:	Rural Community	Date of Count:	8/30/2018

WARRANT 1, Condition A - Minimum Vehicular Volume — 70% Satisfied: No

	Vehicles per hour 70% (56%)	5:00 PM to 6:00 PM	6:45 AM to 7:45 AM	4:00 PM to 5:00 PM	2:45 PM to 3:45 PM	6:00 PM to 7:00 PM	7:45 AM to 8:45 AM	11:30 AM to 12:30 PM	1:45 PM to 2:45 PM
Both Apprchs. Major Street	350 (280)	885	851	771	665	484	415	318	273
Higher Vol. Apprch. Minor Street	105 (84)	28	51	24	20	26	18	17	13

WARRANT 1, Condition B - Interruption of Continuous Traffic — 70% Satisfied: No

	Vehicles per hour 70% (56%)	5:00 PM to 6:00 PM	6:45 AM to 7:45 AM	4:00 PM to 5:00 PM	2:45 PM to 3:45 PM	6:00 PM to 7:00 PM	7:45 AM to 8:45 AM	11:30 AM to 12:30 PM	1:45 PM to 2:45 PM
Both Apprchs. Major Street	525 (420)	885	851	771	665	484	415	318	273
Higher Vol. Apprch. Minor Street	53 (42)	28	51	24	20	26	18	17	13

WARRANT 1, Combination of Conditions A and B — 56% Satisfied: No

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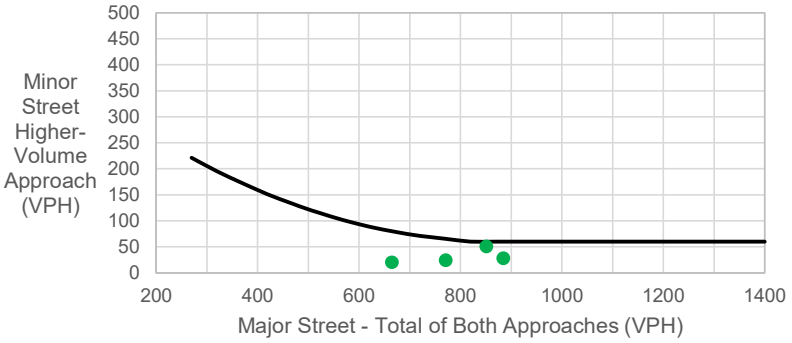
WARRANT 2, Four Hour Vehicular Volume

	Both Apprchs. Major Street	Higher Vol. Apprch. Minor Street
5:00 PM - 6:00 PM	885	28
6:45 AM - 7:45 AM	851	51
4:00 PM - 5:00 PM	771	24
2:45 PM - 3:45 PM	665	20

70% Satisfied: No



MUTCD Multi-Way Stop Evaluation
272nd St & Cliff Ave
2018 - Existing Conditions

FELSBURG HOLT & ULLEVIG

Major Street: Cliff Avenue
Approach Speed: 35 MPH
Option: Low speed
Minor Street: 272nd Street
Date of Count: 8/30/2018

No	Interim measure to control traffic during preparations for traffic signal installation.
No	Five or more crashes in a 12-month period that are susceptible to correction by a multi-way stop installation.
No	Four or more crashes in a 12-month period that are susceptible to correction by a multi-way stop installation.
Yes	Average delay* to minor street vehicular traffic of at least 30 seconds per vehicle during the highest hour.

*Delay estimated by Synchro model.

	Minimum per hour 100% (80%)	5:00 PM to 6:00 PM	6:45 AM to 7:45 AM	4:00 PM to 5:00 PM	2:45 PM to 3:45 PM	6:00 PM to 7:00 PM	7:45 AM to 8:45 AM	11:30 AM to 12:30 PM	1:45 PM to 2:45 PM	Average
Both Apprchs. Major Street	300 (240)	885	851	771	665	484	415	318	273	582
Both Apprchs. Minor Street*	200 (160)	51	75	48	35	35	34	29	18	40

*Combined vehicular, pedestrian, and bicycle volume for both approaches on the minor street.

Interim Control	No
Crashes Satisfied	No
100% Satisfied	No
80% Satisfied	No

One or more criteria satisfied to consider multi-way stop sign installation	No

MUTCD Volume-based Warrant Evaluation
Industrial / Laura St & Cliff Ave
2018 - Existing Conditions

FELSBURG HOLT & ULLEVIG

Major Street:	Cliff Avenue	Minor Street:	Industrial / Laura St
Approach Speed:	35 MPH	Right Turn Volume Included:	100% EB, 100% WB
Lanes Moving Traffic:	1	Lanes Moving Traffic:	1
Option:	Rural Community	Date of Count:	8/30/2018

WARRANT 1, Condition A - Minimum Vehicular Volume

70% Satisfied	No

	Vehicles per hour 70% (56%)	6:45 AM to 7:45 AM	5:00 PM to 6:00 PM	4:00 PM to 5:00 PM	3:00 PM to 4:00 PM	6:00 PM to 7:00 PM	7:45 AM to 8:45 AM	2:00 PM to 3:00 PM	11:30 AM to 12:30 PM
Both Apprchs. Major Street	350 (280)	845	770	596	559	446	438	331	308
Higher Vol. Apprch. Minor Street	105 (84)	94	91	232	178	36	33	101	66

WARRANT 1, Condition B - Interruption of Continuous Traffic

70% Satisfied	No

	Vehicles per hour 70% (56%)	6:45 AM to 7:45 AM	5:00 PM to 6:00 PM	4:00 PM to 5:00 PM	3:00 PM to 4:00 PM	6:00 PM to 7:00 PM	7:45 AM to 8:45 AM	2:00 PM to 3:00 PM	11:30 AM to 12:30 PM
Both Apprchs. Major Street	525 (420)	845	770	596	559	446	438	331	308
Higher Vol. Apprch. Minor Street	53 (42)	94	91	232	178	36	33	101	66

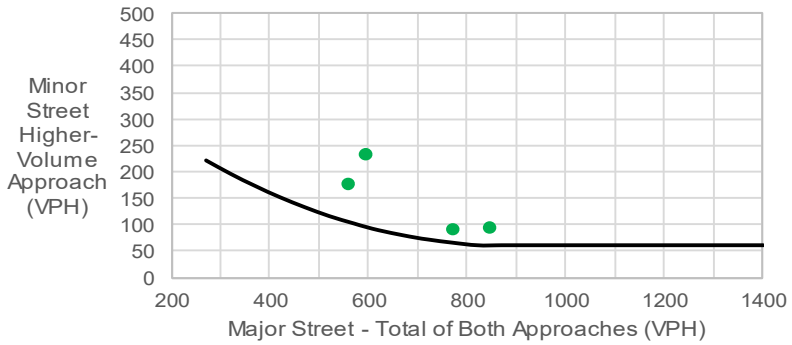
WARRANT 1, Combination of Conditions A and B

56% Satisfied	No

WARRANT 2, Four Hour Vehicular Volume

	Both Apprchs. Major Street	Higher Vol. Apprch. Minor Street
6:45 AM - 7:45 AM	845	94
5:00 PM - 6:00 PM	770	91
4:00 PM - 5:00 PM	596	232
3:00 PM - 4:00 PM	559	178

70% Satisfied	Yes



MUTCD Multi-Way Stop Evaluation
Industrial / Laura St & Cliff Ave
2018 - Existing Conditions

FELSBURG HOLT & ULLEVIG

Major Street: Cliff Avenue
Approach Speed: 35 MPH
Option: Low speed
Minor Street: Industrial / Laura St
Date of Count: 8/30/2018

No	Interim measure to control traffic during preparations for traffic signal installation.
No	Five or more crashes in a 12-month period that are susceptible to correction by a multi-way stop installation.
No	Four or more crashes in a 12-month period that are susceptible to correction by a multi-way stop installation.
Yes	Average delay* to minor street vehicular traffic of at least 30 seconds per vehicle during the highest hour.

*Delay estimated by Synchro model.

	Minimum per hour 100% (80%)	6:45 AM to 7:45 AM	5:00 PM to 6:00 PM	4:00 PM to 5:00 PM	3:00 PM to 4:00 PM	6:00 PM to 7:00 PM	7:45 AM to 8:45 AM	2:00 PM to 3:00 PM	11:30 AM to 12:30 PM	Average
Both Apprchs. Major Street	300 (240)	845	770	596	559	446	438	331	308	536
Both Apprchs. Minor Street*	200 (160)	120	144	287	209	52	59	113	83	133

*Combined vehicular, pedestrian, and bicycle volume for both approaches on the minor street.

Interim Control	No
Crashes Satisfied	No
100% Satisfied	No
80% Satisfied	No

One or more criteria satisfied to consider multi-way stop sign installation	No

MUTCD Volume-based Warrant Evaluation
Willow St & Cliff Ave
2018 - Existing Conditions

Major Street:	Willow Street	Minor Street:	Cliff Avenue
Approach Speed:	35 MPH	Right Turn Volume Included:	100% NB, 100% SB
Lanes Moving Traffic:	1	Lanes Moving Traffic:	2 or more
Option:	Rural Community	Date of Count:	8/29/2018

WARRANT 1, Condition A - Minimum Vehicular Volume

70% Satisfied	No

	Vehicles per hour 70% (56%)	5:15 PM to 6:15 PM	7:00 AM to 8:00 AM	4:15 PM to 5:15 PM	3:00 PM to 4:00 PM	6:15 PM to 7:15 PM	6:00 AM to 7:00 AM	8:00 AM to 9:00 AM	12:45 PM to 1:45 PM
Both Apprchs. Major Street	350 (280)	723	665	626	538	448	406	364	334
Higher Vol. Apprch. Minor Street	140 (112)	414	473	405	306	198	119	127	129

WARRANT 1, Condition B - Interruption of Continuous Traffic

70% Satisfied	No

	Vehicles per hour 70% (56%)	5:15 PM to 6:15 PM	7:00 AM to 8:00 AM	4:15 PM to 5:15 PM	3:00 PM to 4:00 PM	6:15 PM to 7:15 PM	6:00 AM to 7:00 AM	8:00 AM to 9:00 AM	12:45 PM to 1:45 PM
Both Apprchs. Major Street	525 (420)	723	665	626	538	448	406	364	334
Higher Vol. Apprch. Minor Street	70 (56)	414	473	405	306	198	119	127	129

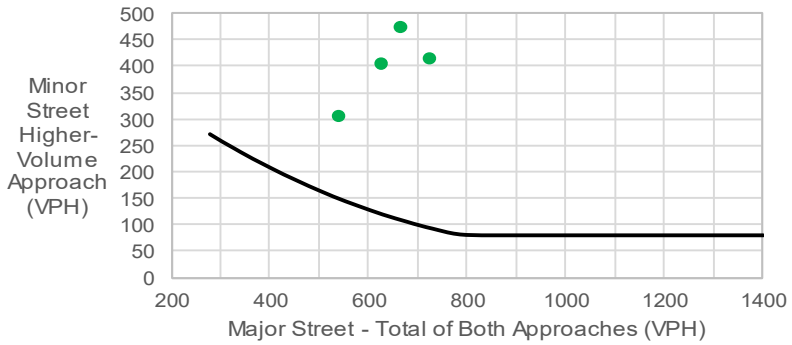
WARRANT 1, Combination of Conditions A and B

56% Satisfied	No

WARRANT 2, Four Hour Vehicular Volume

	Both Apprchs. Major Street	Higher Vol. Apprch. Minor Street
5:15 PM - 6:15 PM	723	414
7:00 AM - 8:00 AM	665	473
4:15 PM - 5:15 PM	626	405
3:00 PM - 4:00 PM	538	306

70% Satisfied	Yes



MUTCD Multi-Way Stop Evaluation
Willow St & Cliff Ave
2018 - Existing Conditions

Major Street: Willow Street
Approach Speed: 35 MPH
Option: Low speed
Minor Street: Cliff Avenue
Date of Count: 8/29/2018

No	Interim measure to control traffic during preparations for traffic signal installation.
No	Five or more crashes in a 12-month period that are susceptible to correction by a multi-way stop installation.
No	Four or more crashes in a 12-month period that are susceptible to correction by a multi-way stop installation.
Yes	Average delay* to minor street vehicular traffic of at least 30 seconds per vehicle during the highest hour.

*Delay estimated by Synchro model.

	Minimum per hour 100% (80%)	5:15 PM to 6:15 PM	7:00 AM to 8:00 AM	4:15 PM to 5:15 PM	3:00 PM to 4:00 PM	6:15 PM to 7:15 PM	6:00 AM to 7:00 AM	8:00 AM to 9:00 AM	12:45 PM to 1:45 PM	Average
Both Apprchs. Major Street	300 (240)	723	665	626	538	448	406	364	334	513
Both Apprchs. Minor Street*	200 (160)	595	691	553	469	283	182	229	201	400

*Combined vehicular, pedestrian, and bicycle volume for both approaches on the minor street.

Interim Control	No
Crashes Satisfied	No
100% Satisfied	Yes
80% Satisfied	No

One or more criteria satisfied to consider multi-way stop sign installation	Yes

MUTCD Volume-based Warrant Evaluation
Willow St & Tiger Way
2018 - Existing Conditions

FELSBURG HOLT & ULLEVIG

Major Street:	Willow Street	Minor Street:	Tiger Way
Approach Speed:	35 MPH	Right Turn Volume Included:	100% NB, 100% SB
Lanes Moving Traffic:	1	Lanes Moving Traffic:	2 or more
Option:	Rural Community	Date of Count:	8/30/2018

WARRANT 1, Condition A - Minimum Vehicular Volume

70% Satisfied	No

	Vehicles per hour 70% (56%)	7:00 AM to 8:00 AM	5:00 PM to 6:00 PM	4:00 PM to 5:00 PM	6:00 PM to 7:00 PM	3:00 PM to 4:00 PM	2:00 PM to 3:00 PM	11:30 AM to 12:30 PM	6:00 AM to 7:00 AM
Both Apprchs. Major Street	350 (280)	984	846	618	565	483	337	315	260
Higher Vol. Apprch. Minor Street	140 (112)	88	72	37	22	226	53	38	5

WARRANT 1, Condition B - Interruption of Continuous Traffic

70% Satisfied	No

	Vehicles per hour 70% (56%)	7:00 AM to 8:00 AM	5:00 PM to 6:00 PM	4:00 PM to 5:00 PM	6:00 PM to 7:00 PM	3:00 PM to 4:00 PM	2:00 PM to 3:00 PM	11:30 AM to 12:30 PM	6:00 AM to 7:00 AM
Both Apprchs. Major Street	525 (420)	984	846	618	565	483	337	315	260
Higher Vol. Apprch. Minor Street	70 (56)	88	72	37	22	226	53	38	5

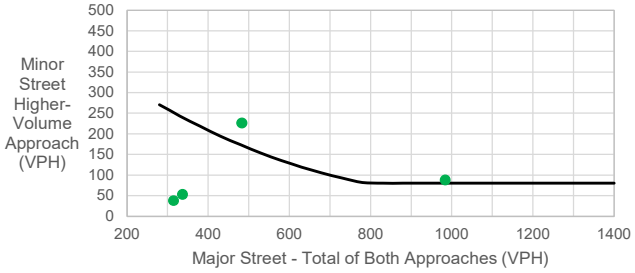
WARRANT 1, Combination of Conditions A and B

56% Satisfied	No

WARRANT 2, Four Hour Vehicular Volume

	Both Apprchs. Major Street	Higher Vol. Apprch. Minor Street
7:00 AM - 8:00 AM	984	88
3:00 PM - 4:00 PM	483	226
2:00 PM - 3:00 PM	337	53
11:30 AM - 12:30 PM	315	38

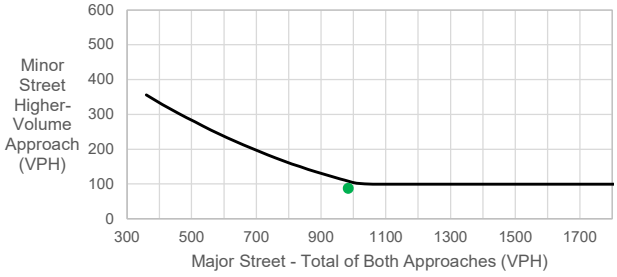
70% Satisfied	No



WARRANT 3, Peak Hour

	Both Apprchs. Major Street	Higher Vol. Apprch. Minor Street
7:00 AM - 8:00 AM	984	88

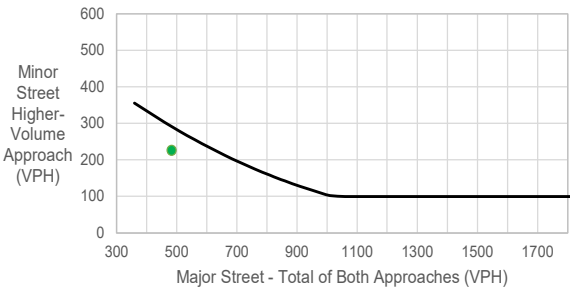
70% Satisfied	No



WARRANT 3, Peak Hour

	Both Apprchs. Major Street	Higher Vol. Apprch. Minor Street
3:00 PM to4:00 PM	483	226

70% Satisfied	No



MUTCD Multi-Way Stop Evaluation
Willow St & Tiger Way
2018 - Existing Conditions

Major Street: Willow Street
Approach Speed: 35 MPH
Option: Low speed
Minor Street: Tiger Way
Date of Count: 8/30/2018

No	Interim measure to control traffic during preparations for traffic signal installation.
No	Five or more crashes in a 12-month period that are susceptible to correction by a multi-way stop installation.
No	Four or more crashes in a 12-month period that are susceptible to correction by a multi-way stop installation.
Yes	Average delay* to minor street vehicular traffic of at least 30 seconds per vehicle during the highest hour.

*Delay estimated by Synchro model.

	Minimum per hour 100% (80%)	7:00 AM to 8:00 AM	5:00 PM to 6:00 PM	4:00 PM to 5:00 PM	6:00 PM to 7:00 PM	3:00 PM to 4:00 PM	2:00 PM to 3:00 PM	11:30 AM to 12:30 PM	6:00 AM to 7:00 AM	Average
Both Apprchs. Major Street	300 (240)	984	846	618	565	483	337	315	260	551
Both Apprchs. Minor Street*	200 (160)	88	72	37	22	226	53	38	5	67

*Combined vehicular, pedestrian, and bicycle volume for both approaches on the minor street.

Interim Control	No
Crashes Satisfied	No
100% Satisfied	No
80% Satisfied	No

One or more criteria satisfied to consider multi-way stop sign installation	No

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↰	↑			↕			↕	
Traffic Vol, veh/h	19	5	5	22	5	20	5	496	4	4	269	9
Future Vol, veh/h	19	5	5	22	5	20	5	496	4	4	269	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	5	2	2	13	25	9	2	17	5	2	7	2
Mvmt Flow	21	6	6	25	6	22	6	557	4	4	302	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	900	888	307	892	891	559	312	0	0	561	0	0
Stage 1	315	315	-	571	571	-	-	-	-	-	-	-
Stage 2	585	573	-	321	320	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.52	6.22	7.23	6.75	6.29	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.15	5.52	-	6.23	5.75	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.52	-	6.23	5.75	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.018	3.318	3.617	4.225	3.381	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	256	283	733	251	258	515	1248	-	-	1010	-	-
Stage 1	690	656	-	487	470	-	-	-	-	-	-	-
Stage 2	492	504	-	668	613	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	239	280	733	243	255	515	1248	-	-	1010	-	-
Mov Cap-2 Maneuver	239	280	-	243	255	-	-	-	-	-	-	-
Stage 1	685	653	-	484	467	-	-	-	-	-	-	-
Stage 2	462	500	-	654	610	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.7	17.5	0.1	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1248	-	-	278	243	428	1010	-	-
HCM Lane V/C Ratio	0.005	-	-	0.117	0.102	0.066	0.004	-	-
HCM Control Delay (s)	7.9	0	-	19.7	21.5	14	8.6	0	-
HCM Lane LOS	A	A	-	C	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.3	0.2	0	-	-

MOVEMENT SUMMARY

Site: 1 [a2018]

Cliff Ave & 272nd St
2018 AM 1
Site Category: (None)
Roundabout

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: NB Cliff Ave												
3	L2	5	2.0	0.480	8.0	LOS A	2.9	80.8	0.19	0.07	0.19	29.7
8	T1	539	17.0	0.480	8.4	LOS A	2.9	80.8	0.19	0.07	0.19	32.4
18	R2	4	5.0	0.480	8.1	LOS A	2.9	80.8	0.19	0.07	0.19	28.8
Approach		549	16.8	0.480	8.4	LOS A	2.9	80.8	0.19	0.07	0.19	32.4
East: WB 272nd St												
1	L2	24	13.0	0.082	6.7	LOS A	0.3	7.8	0.58	0.53	0.58	28.1
6	T1	5	25.0	0.082	7.3	LOS A	0.3	7.8	0.58	0.53	0.58	28.0
16	R2	22	9.0	0.082	6.5	LOS A	0.3	7.8	0.58	0.53	0.58	30.0
Approach		51	12.6	0.082	6.7	LOS A	0.3	7.8	0.58	0.53	0.58	28.9
North: SB Cliff Ave												
7	L2	4	2.0	0.247	5.0	LOS A	1.2	32.7	0.16	0.06	0.16	34.3
4	T1	292	7.0	0.247	5.1	LOS A	1.2	32.7	0.16	0.06	0.16	34.3
14	R2	10	2.0	0.247	5.0	LOS A	1.2	32.7	0.16	0.06	0.16	33.6
Approach		307	6.8	0.247	5.1	LOS A	1.2	32.7	0.16	0.06	0.16	34.3
West: EB 272nd St												
5	L2	21	5.0	0.034	4.2	LOS A	0.1	3.4	0.43	0.29	0.43	32.2
2	T1	5	2.0	0.034	4.1	LOS A	0.1	3.4	0.43	0.29	0.43	29.2
12	R2	5	2.0	0.034	4.1	LOS A	0.1	3.4	0.43	0.29	0.43	28.6
Approach		32	4.0	0.034	4.2	LOS A	0.1	3.4	0.43	0.29	0.43	31.0
All Vehicles		938	12.8	0.480	7.1	LOS A	2.9	80.8	0.21	0.10	0.21	32.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	2	9	9	4	15	7	265	15	26	555	17
Future Vol, veh/h	12	2	9	9	4	15	7	265	15	26	555	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	13	2	2	2	2	2	2
Mvmt Flow	13	2	9	9	4	16	7	276	16	27	578	18

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	949	947	587	945	948	284	596	0	0	292	0	0
Stage 1	641	641	-	298	298	-	-	-	-	-	-	-
Stage 2	308	306	-	647	650	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.33	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.417	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	240	261	510	242	261	729	980	-	-	1270	-	-
Stage 1	463	469	-	711	667	-	-	-	-	-	-	-
Stage 2	702	662	-	460	465	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	225	250	510	229	250	729	980	-	-	1270	-	-
Mov Cap-2 Maneuver	225	250	-	229	250	-	-	-	-	-	-	-
Stage 1	459	454	-	705	661	-	-	-	-	-	-	-
Stage 2	676	656	-	435	450	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.5	15.2	0.2	0.3
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	980	-	-	291	229	519	1270	-	-
HCM Lane V/C Ratio	0.007	-	-	0.082	0.041	0.038	0.021	-	-
HCM Control Delay (s)	8.7	0	-	18.5	21.4	12.2	7.9	0	-
HCM Lane LOS	A	A	-	C	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.1	0.1	0.1	-	-

MOVEMENT SUMMARY

Site: 1 [p2018]

Cliff Ave & 272nd St
2018 PM 1
Site Category: (None)
Roundabout

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: NB Cliff Ave												
3	L2	8	2.0	0.241	4.9	LOS A	1.3	32.4	0.18	0.07	0.18	31.0
8	T1	288	2.0	0.241	4.9	LOS A	1.3	32.4	0.18	0.07	0.18	34.3
18	R2	16	2.0	0.241	4.9	LOS A	1.3	32.4	0.18	0.07	0.18	30.0
Approach		312	2.0	0.241	4.9	LOS A	1.3	32.4	0.18	0.07	0.18	33.9
East: WB 272nd St												
1	L2	10	2.0	0.033	4.0	LOS A	0.1	3.3	0.41	0.27	0.41	29.6
6	T1	4	2.0	0.033	4.0	LOS A	0.1	3.3	0.41	0.27	0.41	29.4
16	R2	16	13.0	0.033	4.4	LOS A	0.1	3.3	0.41	0.27	0.41	31.6
Approach		30	7.9	0.033	4.2	LOS A	0.1	3.3	0.41	0.27	0.41	30.6
North: SB Cliff Ave												
7	L2	28	2.0	0.491	7.8	LOS A	3.8	96.8	0.17	0.05	0.17	32.9
4	T1	603	2.0	0.491	7.8	LOS A	3.8	96.8	0.17	0.05	0.17	33.0
14	R2	18	2.0	0.491	7.8	LOS A	3.8	96.8	0.17	0.05	0.17	32.2
Approach		650	2.0	0.491	7.8	LOS A	3.8	96.8	0.17	0.05	0.17	33.0
West: EB 272nd St												
5	L2	13	2.0	0.036	5.6	LOS A	0.1	3.5	0.57	0.48	0.57	31.5
2	T1	2	2.0	0.036	5.6	LOS A	0.1	3.5	0.57	0.48	0.57	28.6
12	R2	10	2.0	0.036	5.6	LOS A	0.1	3.5	0.57	0.48	0.57	27.9
Approach		25	2.0	0.036	5.6	LOS A	0.1	3.5	0.57	0.48	0.57	29.7
All Vehicles		1017	2.2	0.491	6.7	LOS A	3.8	96.8	0.19	0.07	0.19	33.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

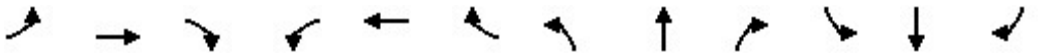
Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↰	↱			↕			↕	
Traffic Vol, veh/h	51	1	50	7	0	21	16	448	21	57	232	9
Future Vol, veh/h	51	1	50	7	0	21	16	448	21	57	232	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	50	2	15	11	4	4	2	5	2
Mvmt Flow	57	1	56	8	0	24	18	503	24	64	261	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	957	957	266	974	950	515	271	0	0	527	0	0
Stage 1	394	394	-	551	551	-	-	-	-	-	-	-
Stage 2	563	563	-	423	399	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.6	6.52	6.35	4.21	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.6	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.6	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.95	4.018	3.435	2.299	-	-	2.218	-	-
Pot Cap-1 Maneuver	237	258	773	190	260	535	1242	-	-	1040	-	-
Stage 1	631	605	-	442	515	-	-	-	-	-	-	-
Stage 2	511	509	-	525	602	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	210	234	773	163	236	535	1242	-	-	1040	-	-
Mov Cap-2 Maneuver	210	234	-	163	236	-	-	-	-	-	-	-
Stage 1	618	561	-	433	504	-	-	-	-	-	-	-
Stage 2	478	498	-	450	558	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.8	16.1	0.3	1.7
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1242	-	-	327	163	535	1040	-	-
HCM Lane V/C Ratio	0.014	-	-	0.35	0.048	0.044	0.062	-	-
HCM Control Delay (s)	7.9	0	-	21.8	28.2	12	8.7	0	-
HCM Lane LOS	A	A	-	C	D	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	1.5	0.2	0.1	0.2	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	1	50	7	0	21	16	448	21	57	232	9
Future Volume (veh/h)	51	1	50	7	0	21	16	448	21	57	232	9
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1159	1870	1870	1841	1841	1841	1826	1826	1826
Adj Flow Rate, veh/h	57	1	56	8	0	24	18	503	24	64	261	10
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	50	2	2	4	4	4	5	5	5
Cap, veh/h	325	2	87	450	0	210	174	808	38	267	677	23
Arrive On Green	0.13	0.13	0.13	0.13	0.00	0.13	0.47	0.47	0.47	0.47	0.47	0.47
Sat Flow, veh/h	666	12	654	834	0	1585	23	1709	80	166	1431	49
Grp Volume(v), veh/h	114	0	0	8	0	24	545	0	0	335	0	0
Grp Sat Flow(s),veh/h/ln	1332	0	0	834	0	1585	1811	0	0	1646	0	0
Q Serve(g_s), s	1.7	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	2.0	0.0	0.0	0.1	0.0	0.3	5.1	0.0	0.0	2.7	0.0	0.0
Prop In Lane	0.50		0.49	1.00		1.00	0.03		0.04	0.19		0.03
Lane Grp Cap(c), veh/h	413	0	0	450	0	210	1019	0	0	967	0	0
V/C Ratio(X)	0.28	0.00	0.00	0.02	0.00	0.11	0.53	0.00	0.00	0.35	0.00	0.00
Avail Cap(c_a), veh/h	1420	0	0	1016	0	1287	2722	0	0	2390	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.6	0.0	0.0	8.6	0.0	8.7	4.5	0.0	0.0	3.9	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.0	0.0	0.2	0.4	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.9	0.0	0.0	8.7	0.0	9.0	5.0	0.0	0.0	4.1	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		114			32			545			335	
Approach Delay, s/veh		9.9			8.9			5.0			4.1	
Approach LOS		A			A			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		15.3		7.5		15.3		7.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		32.5		18.5		32.5		18.5				
Max Q Clear Time (g_c+I1), s		7.1		4.0		4.7		2.3				
Green Ext Time (p_c), s		3.7		0.5		2.3		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			5.3									
HCM 6th LOS			A									

MOVEMENT SUMMARY

Site: 3 [a2018]

Cliff Ave & Industrial/Laura
2018 AM 1
Site Category: (None)
Roundabout

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: NB Cliff Ave												
3	L2	17	11.0	0.450	8.0	LOS A	2.9	74.5	0.39	0.23	0.39	29.7
8	T1	487	4.0	0.450	7.8	LOS A	2.9	74.5	0.39	0.23	0.39	32.8
18	R2	23	4.0	0.450	7.8	LOS A	2.9	74.5	0.39	0.23	0.39	28.9
Approach		527	4.2	0.450	7.8	LOS A	2.9	74.5	0.39	0.23	0.39	32.5
East: WB Industrial Ave												
1	L2	8	50.0	0.051	7.7	LOS A	0.2	4.8	0.55	0.46	0.55	29.2
6	T1	1	2.0	0.051	5.4	LOS A	0.2	4.8	0.55	0.46	0.55	29.4
16	R2	23	15.0	0.051	6.0	LOS A	0.2	4.8	0.55	0.46	0.55	31.5
Approach		32	23.0	0.051	6.4	LOS A	0.2	4.8	0.55	0.46	0.55	30.8
North: SB Cliff Ave												
7	L2	62	2.0	0.253	5.0	LOS A	1.3	34.2	0.15	0.05	0.15	33.9
4	T1	252	5.0	0.253	5.0	LOS A	1.3	34.2	0.15	0.05	0.15	33.9
14	R2	10	2.0	0.253	5.0	LOS A	1.3	34.2	0.15	0.05	0.15	33.2
Approach		324	4.3	0.253	5.0	LOS A	1.3	34.2	0.15	0.05	0.15	33.9
West: EB Laura St												
5	L2	55	2.0	0.116	4.8	LOS A	0.5	12.5	0.46	0.34	0.46	31.7
2	T1	1	2.0	0.116	4.8	LOS A	0.5	12.5	0.46	0.34	0.46	28.8
12	R2	54	2.0	0.116	4.8	LOS A	0.5	12.5	0.46	0.34	0.46	28.1
Approach		111	2.0	0.116	4.8	LOS A	0.5	12.5	0.46	0.34	0.46	29.8
All Vehicles		993	4.6	0.450	6.5	LOS A	2.9	74.5	0.33	0.19	0.33	32.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

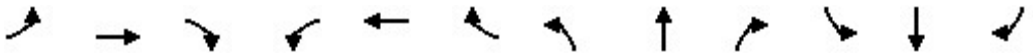
Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↰	↑			↕			↕	
Traffic Vol, veh/h	16	0	37	23	3	65	42	187	10	24	468	39
Future Vol, veh/h	16	0	37	23	3	65	42	187	10	24	468	39
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	10	2	4	2	2
Mvmt Flow	16	0	38	24	3	67	43	193	10	25	482	40

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	871	841	502	855	856	198	522	0	0	203	0	0
Stage 1	552	552	-	284	284	-	-	-	-	-	-	-
Stage 2	319	289	-	571	572	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.14	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.236	-	-
Pot Cap-1 Maneuver	271	301	569	278	295	843	1044	-	-	1357	-	-
Stage 1	518	515	-	723	676	-	-	-	-	-	-	-
Stage 2	693	673	-	506	504	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	234	280	569	245	274	843	1044	-	-	1357	-	-
Mov Cap-2 Maneuver	234	280	-	245	274	-	-	-	-	-	-	-
Stage 1	494	502	-	690	645	-	-	-	-	-	-	-
Stage 2	606	642	-	460	491	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.5	12.9	1.5	0.3
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1044	-	-	397	245	772	1357	-	-
HCM Lane V/C Ratio	0.041	-	-	0.138	0.097	0.091	0.018	-	-
HCM Control Delay (s)	8.6	0	-	15.5	21.3	10.1	7.7	0	-
HCM Lane LOS	A	A	-	C	C	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	0.3	0.3	0.1	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	0	37	23	3	65	42	187	10	24	468	39
Future Volume (veh/h)	16	0	37	23	3	65	42	187	10	24	468	39
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1752	1752	1752	1870	1870	1870
Adj Flow Rate, veh/h	16	0	38	24	3	67	43	193	10	25	482	40
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	10	10	10	2	2	2
Cap, veh/h	246	10	123	519	9	204	246	663	31	181	782	63
Arrive On Green	0.13	0.00	0.13	0.13	0.13	0.13	0.47	0.47	0.47	0.47	0.47	0.47
Sat Flow, veh/h	312	78	926	1370	68	1527	128	1404	65	35	1658	134
Grp Volume(v), veh/h	54	0	0	24	0	70	246	0	0	547	0	0
Grp Sat Flow(s),veh/h/ln	1315	0	0	1370	0	1595	1597	0	0	1826	0	0
Q Serve(g_s), s	0.2	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.1	0.0	0.0	0.3	0.0	0.9	2.0	0.0	0.0	5.1	0.0	0.0
Prop In Lane	0.30		0.70	1.00		0.96	0.17		0.04	0.05		0.07
Lane Grp Cap(c), veh/h	380	0	0	519	0	213	939	0	0	1027	0	0
V/C Ratio(X)	0.14	0.00	0.00	0.05	0.00	0.33	0.26	0.00	0.00	0.53	0.00	0.00
Avail Cap(c_a), veh/h	1397	0	0	1448	0	1295	2326	0	0	2742	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.0	0.0	0.0	8.7	0.0	9.0	3.7	0.0	0.0	4.5	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.0	0.0	0.9	0.1	0.0	0.0	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.0	0.1	0.0	0.2	0.1	0.0	0.0	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.1	0.0	0.0	8.7	0.0	9.8	3.9	0.0	0.0	4.9	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		54			94			246			547	
Approach Delay, s/veh		9.1			9.6			3.9			4.9	
Approach LOS		A			A			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		15.3		7.5		15.3		7.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		32.5		18.5		32.5		18.5				
Max Q Clear Time (g_c+I1), s		4.0		3.1		7.1		2.9				
Green Ext Time (p_c), s		1.6		0.2		3.7		0.3				
Intersection Summary												
HCM 6th Ctrl Delay			5.4									
HCM 6th LOS			A									

MOVEMENT SUMMARY

Site: 3 [p2018]

Cliff Ave & Industrial/Laura
2018 PM 1
Site Category: (None)
Roundabout

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: NB Cliff Ave												
3	L2	46	2.0	0.214	4.7	LOS A	1.0	27.0	0.17	0.06	0.17	30.4
8	T1	203	10.0	0.214	4.9	LOS A	1.0	27.0	0.17	0.06	0.17	33.3
18	R2	11	2.0	0.214	4.7	LOS A	1.0	27.0	0.17	0.06	0.17	29.4
Approach		260	8.3	0.214	4.8	LOS A	1.0	27.0	0.17	0.06	0.17	32.6
East: WB Industrial Ave												
1	L2	25	2.0	0.098	4.4	LOS A	0.4	10.6	0.42	0.29	0.42	30.1
6	T1	3	2.0	0.098	4.4	LOS A	0.4	10.6	0.42	0.29	0.42	29.9
16	R2	71	2.0	0.098	4.4	LOS A	0.4	10.6	0.42	0.29	0.42	32.5
Approach		99	2.0	0.098	4.4	LOS A	0.4	10.6	0.42	0.29	0.42	31.8
North: SB Cliff Ave												
7	L2	26	4.0	0.473	7.9	LOS A	3.2	83.6	0.32	0.16	0.32	32.8
4	T1	509	5.0	0.473	7.9	LOS A	3.2	83.6	0.32	0.16	0.32	32.8
14	R2	42	2.0	0.473	7.9	LOS A	3.2	83.6	0.32	0.16	0.32	32.1
Approach		577	4.7	0.473	7.9	LOS A	3.2	83.6	0.32	0.16	0.32	32.8
West: EB Laura St												
5	L2	17	2.0	0.079	5.7	LOS A	0.3	7.9	0.56	0.49	0.56	31.1
2	T1	1	2.0	0.079	5.7	LOS A	0.3	7.9	0.56	0.49	0.56	28.2
12	R2	40	2.0	0.079	5.7	LOS A	0.3	7.9	0.56	0.49	0.56	27.6
Approach		59	2.0	0.079	5.7	LOS A	0.3	7.9	0.56	0.49	0.56	28.5
All Vehicles		995	5.2	0.473	6.6	LOS A	3.2	83.6	0.31	0.17	0.31	32.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection	
Intersection Delay, s/veh	50.8
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	121	107	58	17	225	137	219	213	41	100	81	137
Future Vol, veh/h	121	107	58	17	225	137	219	213	41	100	81	137
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	4	4	4	2	2	2	2	3	10	2	12	4
Mvmt Flow	146	129	70	20	271	165	264	257	49	120	98	165
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	46.9	95.2	34.6	25.4
HCM LOS	E	F	D	D

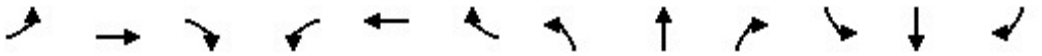
Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	42%	4%	100%	0%
Vol Thru, %	0%	84%	37%	59%	0%	37%
Vol Right, %	0%	16%	20%	36%	0%	63%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	219	254	286	379	100	218
LT Vol	219	0	121	17	100	0
Through Vol	0	213	107	225	0	81
RT Vol	0	41	58	137	0	137
Lane Flow Rate	264	306	345	457	120	263
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.701	0.761	0.851	1.077	0.328	0.664
Departure Headway (Hd)	9.893	9.267	9.221	8.492	10.224	9.414
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	367	392	396	429	354	386
Service Time	7.593	6.967	7.221	6.488	7.924	7.114
HCM Lane V/C Ratio	0.719	0.781	0.871	1.065	0.339	0.681
HCM Control Delay	32.8	36.1	46.9	95.2	17.8	28.9
HCM Lane LOS	D	E	E	F	C	D
HCM 95th-tile Q	5.1	6.2	8.1	15.3	1.4	4.6

Intersection	
Intersection Delay, s/veh	24.5
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	121	107	58	17	225	137	219	213	41	100	81	137
Future Vol, veh/h	121	107	58	17	225	137	219	213	41	100	81	137
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	4	4	4	2	2	2	2	3	10	2	12	4
Mvmt Flow	146	129	70	20	271	165	264	257	49	120	98	165
Number of Lanes	1	1	0	0	1	1	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	19.1	25.2	28.9	22.2
HCM LOS	C	D	D	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	7%	0%	100%	0%
Vol Thru, %	0%	84%	0%	65%	93%	0%	0%	37%
Vol Right, %	0%	16%	0%	35%	0%	100%	0%	63%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	219	254	121	165	242	137	100	218
LT Vol	219	0	121	0	17	0	100	0
Through Vol	0	213	0	107	225	0	0	81
RT Vol	0	41	0	58	0	137	0	137
Lane Flow Rate	264	306	146	199	292	165	120	263
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.663	0.716	0.388	0.486	0.714	0.369	0.315	0.628
Departure Headway (Hd)	9.04	8.422	9.585	8.807	8.814	8.049	9.408	8.606
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	401	428	376	410	411	447	383	420
Service Time	6.783	6.164	7.33	6.552	6.554	5.789	7.152	6.35
HCM Lane V/C Ratio	0.658	0.715	0.388	0.485	0.71	0.369	0.313	0.626
HCM Control Delay	27.9	29.8	18.3	19.6	30.8	15.4	16.4	24.9
HCM Lane LOS	D	D	C	C	D	C	C	C
HCM 95th-tile Q	4.6	5.5	1.8	2.6	5.4	1.7	1.3	4.2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	121	107	58	17	225	137	219	213	41	100	81	137
Future Volume (veh/h)	121	107	58	17	225	137	219	213	41	100	81	137
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1870	1870	1870	1870	1856	1856	1870	1722	1722
Adj Flow Rate, veh/h	146	129	70	20	271	165	264	257	49	120	98	165
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	4	4	4	2	2	2	2	3	3	2	12	12
Cap, veh/h	338	452	245	530	438	267	476	629	120	463	239	403
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	938	1122	609	1183	1088	663	1116	1515	289	1073	577	971
Grp Volume(v), veh/h	146	0	199	20	0	436	264	0	306	120	0	263
Grp Sat Flow(s),veh/h/ln	938	0	1731	1183	0	1751	1116	0	1804	1073	0	1547
Q Serve(g_s), s	7.3	0.0	3.8	0.6	0.0	9.8	10.8	0.0	5.9	4.4	0.0	5.9
Cycle Q Clear(g_c), s	17.1	0.0	3.8	4.4	0.0	9.8	16.7	0.0	5.9	10.3	0.0	5.9
Prop In Lane	1.00		0.35	1.00		0.38	1.00		0.16	1.00		0.63
Lane Grp Cap(c), veh/h	338	0	697	530	0	705	476	0	749	463	0	643
V/C Ratio(X)	0.43	0.00	0.29	0.04	0.00	0.62	0.56	0.00	0.41	0.26	0.00	0.41
Avail Cap(c_a), veh/h	424	0	857	640	0	867	610	0	966	592	0	829
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.5	0.0	10.0	11.5	0.0	11.7	16.1	0.0	10.2	13.8	0.0	10.2
Incr Delay (d2), s/veh	0.9	0.0	0.2	0.0	0.0	0.9	1.0	0.0	0.4	0.3	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	1.2	0.1	0.0	3.1	2.4	0.0	1.9	0.9	0.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.4	0.0	10.2	11.5	0.0	12.7	17.1	0.0	10.5	14.1	0.0	10.6
LnGrp LOS	B	A	B	B	A	B	B	A	B	B	A	B
Approach Vol, veh/h		345			456			570			383	
Approach Delay, s/veh		14.1			12.6			13.6			11.7	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		25.0		24.4		25.0		24.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		26.5		24.5		26.5		24.5				
Max Q Clear Time (g_c+I1), s		18.7		19.1		12.3		11.8				
Green Ext Time (p_c), s		1.8		0.9		1.8		2.3				

Intersection Summary												
HCM 6th Ctrl Delay			13.0									
HCM 6th LOS			B									

MOVEMENT SUMMARY

Site: 3 [a2018]

Cliff Ave & Willow St
2018 AM 1
Site Category: (None)
Roundabout

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: NB Cliff Ave												
3	L2	264	2.0	0.646	14.4	LOS B	7.3	186.3	0.78	0.98	1.29	25.8
8	T1	257	3.0	0.646	14.4	LOS B	7.3	186.3	0.78	0.98	1.29	28.0
18	R2	49	10.0	0.646	14.7	LOS B	7.3	186.3	0.78	0.98	1.29	25.1
Approach		570	3.1	0.646	14.4	LOS B	7.3	186.3	0.78	0.98	1.29	26.7
East: WB Willow St												
1	L2	20	2.0	0.679	19.3	LOS C	6.3	160.0	0.85	1.14	1.60	24.7
6	T1	271	2.0	0.679	19.3	LOS C	6.3	160.0	0.85	1.14	1.60	24.6
16	R2	165	2.0	0.679	19.3	LOS C	6.3	160.0	0.85	1.14	1.60	26.2
Approach		457	2.0	0.679	19.3	LOS C	6.3	160.0	0.85	1.14	1.60	25.2
North: SB Cliff Ave												
7	L2	120	2.0	0.522	12.6	LOS B	3.6	94.5	0.73	0.86	1.08	30.1
4	T1	98	12.0	0.522	13.0	LOS B	3.6	94.5	0.73	0.86	1.08	30.0
14	R2	165	4.0	0.522	12.7	LOS B	3.6	94.5	0.73	0.86	1.08	29.5
Approach		383	5.4	0.522	12.7	LOS B	3.6	94.5	0.73	0.86	1.08	29.8
West: EB Willow St												
5	L2	146	4.0	0.336	7.0	LOS A	1.7	44.9	0.48	0.36	0.48	30.7
2	T1	129	4.0	0.336	7.0	LOS A	1.7	44.9	0.48	0.36	0.48	28.0
12	R2	70	4.0	0.336	7.0	LOS A	1.7	44.9	0.48	0.36	0.48	27.4
Approach		345	4.0	0.336	7.0	LOS A	1.7	44.9	0.48	0.36	0.48	28.9
All Vehicles		1754	3.5	0.679	13.9	LOS B	7.3	186.3	0.73	0.87	1.17	27.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection	
Intersection Delay, s/veh	29.3
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	74	306	51	37	179	72	76	78	45	239	106	126
Future Vol, veh/h	74	306	51	37	179	72	76	78	45	239	106	126
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles, %	3	2	2	2	2	3	2	2	2	2	2	2
Mvmt Flow	79	326	54	39	190	77	81	83	48	254	113	134
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	49.6	23.2	14.6	20.8
HCM LOS	E	C	B	C

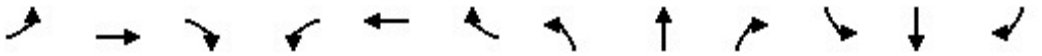
Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	17%	13%	100%	0%
Vol Thru, %	0%	63%	71%	62%	0%	46%
Vol Right, %	0%	37%	12%	25%	0%	54%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	76	123	431	288	239	232
LT Vol	76	0	74	37	239	0
Through Vol	0	78	306	179	0	106
RT Vol	0	45	51	72	0	126
Lane Flow Rate	81	131	459	306	254	247
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.206	0.304	0.919	0.641	0.599	0.519
Departure Headway (Hd)	9.155	8.367	7.217	7.532	8.486	7.574
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	391	429	504	478	425	476
Service Time	6.926	6.137	5.217	5.596	6.249	5.336
HCM Lane V/C Ratio	0.207	0.305	0.911	0.64	0.598	0.519
HCM Control Delay	14.3	14.8	49.6	23.2	23.2	18.3
HCM Lane LOS	B	B	E	C	C	C
HCM 95th-tile Q	0.8	1.3	10.8	4.4	3.8	2.9

Intersection	
Intersection Delay, s/veh	21.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	74	306	51	37	179	72	76	78	45	239	106	126
Future Vol, veh/h	74	306	51	37	179	72	76	78	45	239	106	126
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles, %	3	2	2	2	2	3	2	2	2	2	2	2
Mvmt Flow	79	326	54	39	190	77	81	83	48	254	113	134
Number of Lanes	1	1	0	0	1	1	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	30.4	17.3	14.1	19.6
HCM LOS	D	C	B	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	17%	0%	100%	0%
Vol Thru, %	0%	63%	0%	86%	83%	0%	0%	46%
Vol Right, %	0%	37%	0%	14%	0%	100%	0%	54%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	76	123	74	357	216	72	239	232
LT Vol	76	0	74	0	37	0	239	0
Through Vol	0	78	0	306	179	0	0	106
RT Vol	0	45	0	51	0	72	0	126
Lane Flow Rate	81	131	79	380	230	77	254	247
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.199	0.294	0.179	0.797	0.517	0.155	0.581	0.502
Departure Headway (Hd)	8.868	8.085	8.186	7.552	8.096	7.285	8.231	7.325
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	403	442	437	479	443	490	437	491
Service Time	6.655	5.871	5.956	5.321	5.874	5.062	6.005	5.098
HCM Lane V/C Ratio	0.201	0.296	0.181	0.793	0.519	0.157	0.581	0.503
HCM Control Delay	13.9	14.2	12.7	34.1	19.3	11.4	21.9	17.3
HCM Lane LOS	B	B	B	D	C	B	C	C
HCM 95th-tile Q	0.7	1.2	0.6	7.3	2.9	0.5	3.6	2.8



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	74	306	51	37	179	72	76	78	45	239	106	126
Future Volume (veh/h)	74	306	51	37	179	72	76	78	45	239	106	126
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	79	326	54	39	190	77	81	83	48	254	113	134
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	475	513	85	395	415	168	538	408	236	642	286	340
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.37	0.37	0.37	0.37	0.37	0.37
Sat Flow, veh/h	1104	1565	259	1003	1265	513	1133	1112	643	1259	780	924
Grp Volume(v), veh/h	79	0	380	39	0	267	81	0	131	254	0	247
Grp Sat Flow(s),veh/h/ln	1104	0	1824	1003	0	1778	1133	0	1755	1259	0	1704
Q Serve(g_s), s	1.8	0.0	5.2	1.0	0.0	3.5	1.7	0.0	1.5	5.1	0.0	3.2
Cycle Q Clear(g_c), s	5.3	0.0	5.2	6.2	0.0	3.5	4.9	0.0	1.5	6.6	0.0	3.2
Prop In Lane	1.00		0.14	1.00		0.29	1.00		0.37	1.00		0.54
Lane Grp Cap(c), veh/h	475	0	598	395	0	583	538	0	645	642	0	626
V/C Ratio(X)	0.17	0.00	0.64	0.10	0.00	0.46	0.15	0.00	0.20	0.40	0.00	0.39
Avail Cap(c_a), veh/h	991	0	1451	864	0	1414	1177	0	1633	1351	0	1586
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.9	0.0	8.4	11.1	0.0	7.8	8.7	0.0	6.4	8.6	0.0	6.9
Incr Delay (d2), s/veh	0.2	0.0	1.1	0.1	0.0	0.6	0.1	0.0	0.2	0.4	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	1.3	0.2	0.0	0.8	0.3	0.0	0.3	0.9	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.1	0.0	9.6	11.2	0.0	8.4	8.8	0.0	6.5	9.0	0.0	7.3
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		459			306			212			501	
Approach Delay, s/veh		9.6			8.8			7.4			8.2	
Approach LOS		A			A			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		15.4		14.2		15.4		14.2				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		27.5		23.5		27.5		23.5				
Max Q Clear Time (g_c+I1), s		6.9		7.3		8.6		8.2				
Green Ext Time (p_c), s		0.9		2.3		2.2		1.5				

Intersection Summary												
HCM 6th Ctrl Delay			8.7									
HCM 6th LOS			A									

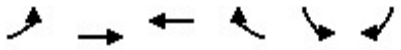
MOVEMENT SUMMARY

Site: 3 [p2018]

Cliff Ave & Willow St
2018 PM 1
Site Category: (None)
Roundabout

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: NB Cliff Ave												
3	L2	83	2.0	0.322	9.5	LOS A	1.4	36.5	0.67	0.68	0.69	27.3
8	T1	85	2.0	0.322	9.5	LOS A	1.4	36.5	0.67	0.68	0.69	29.8
18	R2	49	2.0	0.322	9.5	LOS A	1.4	36.5	0.67	0.68	0.69	26.5
Approach		216	2.0	0.322	9.5	LOS A	1.4	36.5	0.67	0.68	0.69	28.0
East: WB Willow St												
1	L2	40	2.0	0.300	6.4	LOS A	1.5	39.0	0.47	0.35	0.47	28.3
6	T1	195	2.0	0.300	6.4	LOS A	1.5	39.0	0.47	0.35	0.47	28.2
16	R2	78	2.0	0.300	6.4	LOS A	1.5	39.0	0.47	0.35	0.47	30.3
Approach		313	2.0	0.300	6.4	LOS A	1.5	39.0	0.47	0.35	0.47	28.7
North: SB Cliff Ave												
7	L2	260	2.0	0.526	10.4	LOS B	4.1	104.6	0.65	0.62	0.79	30.7
4	T1	115	2.0	0.526	10.4	LOS B	4.1	104.6	0.65	0.62	0.79	30.8
14	R2	137	2.0	0.526	10.4	LOS B	4.1	104.6	0.65	0.62	0.79	30.1
Approach		512	2.0	0.526	10.4	LOS B	4.1	104.6	0.65	0.62	0.79	30.6
West: EB Willow St												
5	L2	80	3.0	0.534	11.4	LOS B	4.3	109.5	0.70	0.80	0.97	28.6
2	T1	333	2.0	0.534	11.4	LOS B	4.3	109.5	0.70	0.80	0.97	26.2
12	R2	55	2.0	0.534	11.4	LOS B	4.3	109.5	0.70	0.80	0.97	25.7
Approach		468	2.2	0.534	11.4	LOS B	4.3	109.5	0.70	0.80	0.97	26.6
All Vehicles		1510	2.1	0.534	9.7	LOS A	4.3	109.5	0.63	0.63	0.77	28.5

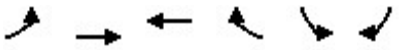
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	42	178	462	302	54	34
Future Volume (veh/h)	42	178	462	302	54	34
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1767	1856
Adj Flow Rate, veh/h	55	234	608	397	71	45
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Percent Heavy Veh, %	4	4	2	2	9	3
Cap, veh/h	191	790	1421	1205	269	252
Arrive On Green	0.76	0.76	0.76	0.76	0.16	0.16
Sat Flow, veh/h	206	1040	1870	1585	1682	1572
Grp Volume(v), veh/h	289	0	608	397	71	45
Grp Sat Flow(s),veh/h/ln	1245	0	1870	1585	1682	1572
Q Serve(g_s), s	1.7	0.0	14.4	10.0	4.6	3.1
Cycle Q Clear(g_c), s	16.2	0.0	14.4	10.0	4.6	3.1
Prop In Lane	0.19			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	981	0	1421	1205	269	252
V/C Ratio(X)	0.29	0.00	0.43	0.33	0.26	0.18
Avail Cap(c_a), veh/h	981	0	1421	1205	269	252
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	4.5	0.0	5.3	4.8	46.0	45.4
Incr Delay (d2), s/veh	0.8	0.0	0.9	0.7	2.4	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	5.1	3.0	2.1	1.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.2	0.0	6.3	5.5	48.4	47.0
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		289	1005		116	
Approach Delay, s/veh		5.2	6.0		47.9	
Approach LOS		A	A		D	

Timer - Assigned Phs		4		6	8
Phs Duration (G+Y+Rc), s		100.0		25.0	100.0
Change Period (Y+Rc), s		5.0		5.0	5.0
Max Green Setting (Gmax), s		95.0		20.0	95.0
Max Q Clear Time (g_c+I1), s		18.2		6.6	16.4
Green Ext Time (p_c), s		2.5		0.2	6.4

Intersection Summary	
HCM 6th Ctrl Delay	9.3
HCM 6th LOS	A



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	506	276	53	57	15
Future Volume (veh/h)	11	506	276	53	57	15
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	12	538	294	56	61	16
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	42	1399	1421	1205	285	254
Arrive On Green	0.76	0.76	0.76	0.76	0.16	0.16
Sat Flow, veh/h	17	1840	1870	1585	1781	1585
Grp Volume(v), veh/h	550	0	294	56	61	16
Grp Sat Flow(s),veh/h/ln	1857	0	1870	1585	1781	1585
Q Serve(g_s), s	0.0	0.0	5.6	1.1	3.7	1.1
Cycle Q Clear(g_c), s	12.5	0.0	5.6	1.1	3.7	1.1
Prop In Lane	0.02			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	1441	0	1421	1205	285	254
V/C Ratio(X)	0.38	0.00	0.21	0.05	0.21	0.06
Avail Cap(c_a), veh/h	1441	0	1421	1205	285	254
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	5.1	0.0	4.3	3.7	45.7	44.5
Incr Delay (d2), s/veh	0.8	0.0	0.3	0.1	1.7	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	0.0	2.0	0.3	1.8	0.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.9	0.0	4.6	3.8	47.4	45.0
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		550	350		77	
Approach Delay, s/veh		5.9	4.5		46.9	
Approach LOS		A	A		D	

Timer - Assigned Phs		4		6	8
Phs Duration (G+Y+Rc), s		100.0		25.0	100.0
Change Period (Y+Rc), s		5.0		5.0	5.0
Max Green Setting (Gmax), s		95.0		20.0	95.0
Max Q Clear Time (g_c+I1), s		14.5		5.7	7.6
Green Ext Time (p_c), s		4.0		0.1	2.0

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